



## BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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Jamey Tesler, Acting MassDOT Secretary and CEO and MPO Chair  
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### WORK PLAN

## BUS NETWORK REDESIGN SERVICE EQUITY ANALYSIS

APRIL 29, 2021

### Project Identification

**Project Number** 13309

**Client**

Caroline Vanasse, Massachusetts Department of Transportation (MassDOT)

**Project Supervisors**

*Principal:* Paul Christner

*Manager:* Steven Andrews

**Funding Source**

MassDOT 3C PL Contract

### Schedule and Budget

**Schedule:** Five months after work commences

**Budget:** \$48,190

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

### Background

Over the past few years, the MBTA and MassDOT have been exploring how the MBTA network is serving the Greater Boston region from a system-wide perspective. This project, known as the Bus Network Redesign (BNRD), seeks to review the bus system as a holistic and interconnected network rather than analyzing routes as singular entities. Outcomes from the BNRD project are likely to be recommendations for substantial route structure and route alignment changes.

The Federal Transit Administration (FTA) requires transit agencies to perform a Title VI service equity analysis prior to the implementation of major service changes to ensure that they meet their obligations to prevent discriminatory impacts based on race, color, or national origin and disproportionate impacts based on low-income status.

Central Transportation Planning Staff (CTPS) will assist MassDOT and the MBTA with the BNRD Service Equity Analysis. Following the MBTA's Disparate

Impact/Disproportionate Burden (DI/DB) Policy, staff will evaluate whether the effects of the proposed changes in weekly revenue-vehicle hours and route length are equitable. In addition to the equity metrics specified in the DI/DB Policy, MassDOT and the MBTA may ask CTPS to explore the equity implications of other metrics. For example, staff may use a CTPS-developed tool, known as the Modified Transit Opportunity Index (MTOI), to evaluate changes in the amount of transit access available to the protected populations and to the non-protected populations. CTPS will prepare documentation of its analyses and assist MassDOT and the MBTA with preparing for public presentations of the results.

Finally, CTPS will provide ongoing BNRD-related service planning support and assist the MassDOT and the MBTA in designing maps, graphics, and other visual products as requested.

## **Objectives**

The objectives of this project are to support MassDOT and the MBTA by providing insights into the equity implications of proposed network changes, performing a formal Title VI service equity analysis on a preferred alternative, and providing planning and graphical support.

## **Work Description**

Work for this project will take place in three tasks.

### **Task 1 Develop Tools for Performing Service Equity Analyses**

CTPS has developed tools and processes to conduct equity analyses. Each service equity analysis tends to have specific intricacies that require some adjustments to the existing tools.

For example, MassDOT is expecting to create “generalized” General Transit Feed Specification (GTFS) files for its BNRD alternatives. The recently developed process to create generalized GTFS files allows planners to quickly create a planning-level representation of the network based on a set of proposed changes. CTPS will evaluate the specific file formats used for the BNRD project and adapt the existing tools to accept and process these files.

Further, MassDOT is planning to measure other metrics, related to trip coverage and regional access, in addition to those in the MBTA’s DI/DB Policy. CTPS will need to modify its existing tools to evaluate these new metrics.

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

Tools that accept and process the MBTA’s file formats and incorporate MassDOT’s additional metrics

**Task 2 Initialize Base Conditions and Perform Title VI Service Equity Analyses**

After tools are developed, CTPS will begin the process of conducting service equity analyses starting with the base conditions. Staff will coordinate with MassDOT and the MBTA to choose the base scenario and the demographic datasets to be used—potentially rider survey, US Census, or location-based-service data.

Following the generation and validation of the base scenario, CTPS will begin estimating the equity impacts of as many as three different sets of potential future bus networks. CTPS will provide the relevant parties with documentation of the service equity analyses in a technical memorandum, along with technical support for publishing and presenting the results.

Following the selection of a preferred alternative, which may be different from the original three proposals, CTPS will generate a final analysis and a final formal Title VI service equity analysis to be presented to the Fiscal and Management Control Board (FMCB) prior to implementation.

***Products of Task 2***

Technical memoranda documenting the service equity analyses for each alternative and the preferred alternative

**Task 3 Provide Mapping, Planning, and Technical Support to MassDOT and MBTA**

CTPS staff will assist MassDOT and the MBTA with designing maps, graphics, and other visual products as requested to support this project. CTPS staff will provide ongoing planning and technical assistance to MassDOT and the MBTA with tasks related to this project as necessary. These tasks will be undertaken as the overall budget allows.

***Products of Task 3***

Maps, graphics, and other visual products and ongoing planning and technical support

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

**Exhibit 1**  
**ESTIMATED SCHEDULE**  
**Bus Network Redesign Service Equity Analysis**

Task	Month				
	1	2	3	4	5
1. Develop Tools for Performing Service Equity Analyses	█				
2. Initialize Base Conditions and Perform Title VI Service Equity Analyses			█ A B		
3. Provide Mapping, Planning, and Technical Support to MassDOT and MBTA	█				

- Products/Milestones
- A: Draft Service Equity Analyses
  - B: Preferred Alternative Service Equity Analysis

**Exhibit 2**  
**ESTIMATED COST**  
**Bus Network Redesign Service Equity Analysis**

<b>Direct Salary and Overhead</b>	<b>\$48,190</b>
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Task	Person-Weeks				Direct Salary	Overhead (106%)	Total Cost
	M-1	P-5	P-2	Total			
1. Develop Tools for Performing Service Equity Analyses	0.0	2.0	1.0	3.0	\$4,163	\$4,413	\$8,577
2. Initialize Base Conditions and Perform Title VI Service Equity Analyses	2.0	5.0	4.5	11.5	\$15,847	\$16,798	\$32,645
3. Provide Mapping, Planning, and Technical Support to MassDOT and MBTA	0.0	2.0	0.0	2.0	\$3,383	\$3,586	\$6,968
Total	2.0	9.0	5.5	16.5	\$23,393	\$24,797	\$48,190

<b>Other Direct Costs</b>	<b>\$0</b>
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<b>TOTAL COST</b>	<b>\$48,190</b>
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**Funding**  
 MassDOT 3C PL Contract