



# BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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Jamey Tesler, MassDOT Secretary and CEO and MPO Chair  
Tegin L. Teich, Executive Director, MPO Staff

## WORK PROGRAM

### RED BLUE CONNECTOR STUDY

NOVEMBER 3, 2022

#### 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** 22217

##### Client

Massachusetts Bay Transportation Authority (MBTA)  
*Client Supervisor: Shannon Greenwell*

##### Project Supervisors

*Principal: Rose McCarron*  
*Manager: Benjamin Dowling*

##### Funding Source

Future MBTA Contract

#### Schedule and Budget

**Schedule:** 24 months from notice to proceed

**Budget:** \$213,000

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

The Massachusetts Bay Transportation Authority (MBTA) has proposed to connect the Red and Blue Lines by extending the Blue Line below Cambridge Street to the Charles/MGH Station on the Red Line. A direct connection between these lines would reduce the number of transfers and improve travel time for people traveling between Cambridge and neighborhoods northeast of downtown Boston. The project would result in a 2500-foot, two-track tunnel under Cambridge Street, modifications to the Charles/MGH Station to accommodate Blue Line service, closure of the Bowdoin Station on the Blue Line, and construction of overnight train storage tracks.

The MBTA has asked the Central Transportation Planning Staff (CTPS) to support the transportation analysis of the Red Blue Connector project. The results of the analysis will inform the Massachusetts Environmental Policy Act (MEPA) and National Environmental Policy Act (NEPA) permitting for this project. The MBTA has requested information on the project's impact on transit ridership, trip generation and distribution, mode share, air quality, and environmental justice.

CTPS previously studied the Red Blue Connector project for a Draft Environmental Impact Report in 2010. The project must be reevaluated to capture changes in existing conditions and future land use and transportation network scenarios. CTPS will support the MBTA and its project teams by assessing the existing travel patterns and by providing modeling results and analyses to help evaluate the impacts of the project.

## Objectives

The principal objective of this study is to support the MBTA and its project teams in the planning tasks that are associated with the Red Blue Connector and to provide the necessary data to understand the potential traffic and transit impacts of the project. CTPS will also support engagement with stakeholders and the public.

## Work Description

CTPS will use the Boston Region MPO's travel demand model to analyze the traffic and transit impact of the proposed connection between the Red and Blue Lines and the closure of Bowdoin Station. The work required to meet the immediate needs of the MBTA project team will be carried out in the tasks described below.

### **Task 1 Project Coordination and Engagement Support**

CTPS will work with the MBTA and its consultants to help develop travel demand forecasts and will support presentations of the analysis to stakeholders.

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

- Administrative activities and internal coordination
- Coordination with the MBTA, consultants, and stakeholders

- Support for as many as two public meetings
- Review of documents and presentation materials

### **Task 2 Calibrate and Validate Base Year**

The travel demand model is calibrated at the statewide level. To ensure reasonable sensitivity to the proposed project, CTPS will recalibrate and potentially refine the model to best reflect the existing conditions in the study area. This calibration will be informed by vehicle and ridership counts provided by the MBTA and its consultant team. Calibration efforts will focus on the AM and PM peak periods.

#### ***Products of Task 2***

- Calibrated multimodal travel demand model set for the study area which will serve as the Base Year scenario
- Station walk access—to/from key stations by transportation analysis zone (TAZ) for Charles/MGH, Bowdoin, Park Street, State Street, Downtown Crossing, and Government Center Stations
- Transfers by direction (example: Red Line North to Blue Line East) for Charles/MGH, Bowdoin, Park Street, State Street, Downtown Crossing, and Government Center Stations
- Boardings/alightings by line and station (Red, Green [central subway only], Blue, and Orange Lines)
- Transit system summary by line
- Traffic volume outputs (loaded traffic-volume networks and TransCAD geographical files for AM and PM peak periods) from the model at all study area intersections for comparison to existing traffic counts
- Systemwide fare revenue data

### **Task 3 Model Year of Opening Scenarios**

CTPS will use the calibrated Base Year model developed in Task 2 and apply it to the Year of Opening model scenario. The land use scenario for this alternative will be based on an interpolation between the Base Year and the Horizon Year land use assumptions developed for the Boston Region MPO's Long Range Transportation Plan (LRTP). The MBTA and its consultants will provide information on additional land use and transportation projects that are projected to impact the study area in the year of opening. The No-Build transportation network will be based on Base Year network. The Build transportation network will include the proposed Red Blue Connector project. CTPS will model the No-Build and Build scenarios and summarize the effect on travel patterns and mode choice.

***Products of Task 3***

CTPS will provide the following data for each model scenario:

- Summaries of model inputs, including land use changes proximate to the study area
- Mode share
- Station walk access – to/from key stations by TAZ for Charles/MGH, Bowdoin, Park Street, State Street, Downtown Crossing, and Government Center Stations
- Transfers by direction (example: Red Line North to Blue Line East) for Charles/MGH, Bowdoin, Park Street, State Street, Downtown Crossing, and Government Center Stations
- Boardings/alightings by line and station (Red, Green [central subway only], Blue, and Orange Lines)
- Transit system summary by line
- Traffic volume outputs (loaded traffic-volume networks and TransCAD geographical files for AM and PM peak periods) from the model at all study area intersections for comparison to existing traffic counts
- Systemwide fare revenue data

**Task 4 Model Horizon Year Scenarios**

CTPS will use the calibrated Base Year model developed in Task 2 and apply it to the Horizon Year model scenario. The land use scenario for this alternative will be based on the Horizon Year land use assumptions developed for the Boston Region MPO's LRTP. The MBTA and its consultants will provide information on additional land use projects that are projected to impact the study area in the Horizon Year. The No-Build transportation network will be based on the infrastructure assumptions included in the LRTP. The Build transportation network will include the proposed Red Blue Connector project. CTPS will model the No-Build and Build scenarios and summarize the effect on travel patterns and mode choice.

***Products of Task 4***

CTPS will provide the following data for each model scenario:

- Summaries of model inputs, including land use changes proximate to the study area
- Mode share

- Station walk access—to/from key stations by TAZ for Charles/MGH, Bowdoin, Park Street, State Street, Downtown Crossing, and Government Center Stations
- Transfers by direction (example: Red Line North to Blue Line East) for Charles/MGH, Bowdoin, Park Street, State Street, Downtown Crossing, and Government Center Stations
- Boardings/alightings by line and station (Red, Green [central subway only], Blue, and Orange Line)
- Transit system summary by line
- Traffic volume outputs (loaded traffic-volume networks and TransCAD geographical files for AM and PM peak periods) from the model at all study area intersections for comparison to existing traffic counts
- System-wide fare revenue data

#### **Task 5 Perform Air Quality Analyses**

CTPS will perform highway air quality analyses in coordination with the project team. The air quality analyses, which will be based on the model outputs of the previous tasks, will estimate roadway mobile emissions from automobiles and trucks of carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), and particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>).

##### ***Products of Task 5***

For each scenario modeled in Tasks 3 and 4 CTPS will provide the following:

- Tabular summaries of mobile emissions
- Vehicle-miles traveled (VMT)

#### **Task 6 Perform Environmental Justice Analyses**

CTPS will perform environmental justice analyses in coordination with the project team. The environmental justice analyses, which will be based on the model outputs of the previous tasks, will identify population groups (minority and non-minority) and income groups (low-income and non-low-income) in the study area. The benefits and burdens of the project will be evaluated for these population and income groups.

##### ***Products of Task 6***

For each scenario modeled in Tasks 3 and 4 CTPS will provide tabular summaries of the environmental justice analyses

#### **Task 7 Develop Inputs for Economic Impact Analysis (OPTIONAL)**

The MBTA may conduct the economic impact analysis for the Boston region using the Transportation Economic Development Impact System (TREDIS). TREDIS

requires as input aggregated roadway and transit results from a regional model segmented by mode, trip purpose, level of service, and time period. CTPS will provide the land use data and the Build and No-Build transportation networks to support this analysis.

***Products of Task 7***

Populated table of traveler characteristics to support TREDIS analysis

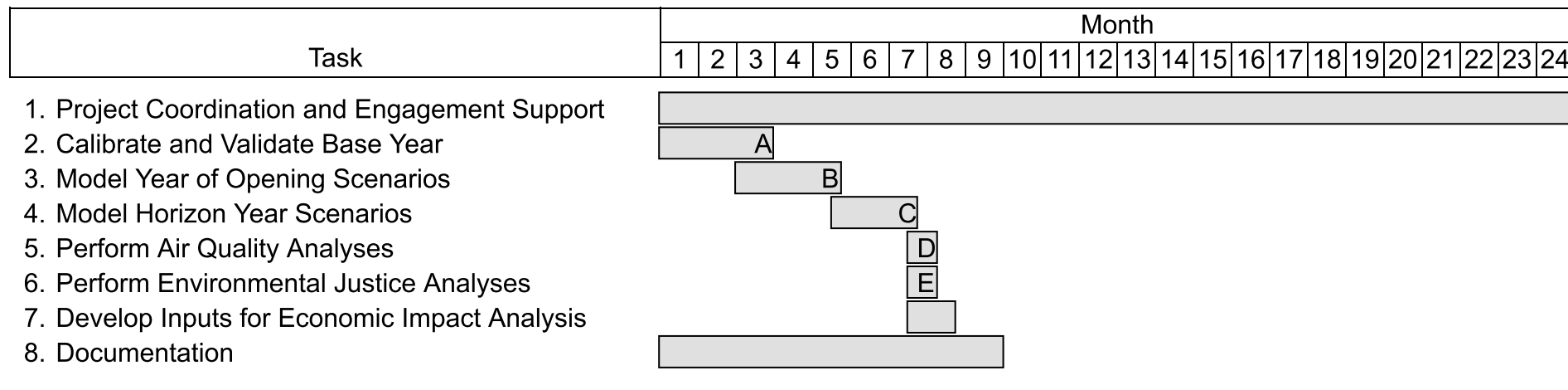
**Task 8 Documentation**

CTPS staff will document the methodology developed to support MassDOT's study and the results of the analysis.

***Products of Task 8***

Documentation describing the methodology and results

**Exhibit 1**  
**ESTIMATED SCHEDULE**  
**Red Blue Connector**



**Products/Milestones**

- A: Calibrated Base Year Model
- B: Model Data from Year of Opening Scenarios
- C: Model Data from Horizon Year Scenarios
- D: Air Quality Data
- E: Environmental Justice Data

**Exhibit 2**  
**ESTIMATED COST**  
**Red Blue Connector**

<b>Direct Salary and Overhead</b>	<b>\$213,000</b>
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Task	Person-Weeks						Direct Salary	Overhead (119.34%)	Total Cost
	M-1	P-5	P-4	P-3	P-2	Total			
1. Project Coordination and Engagement Support	1.2	0.0	5.0	0.0	0.0	6.2	\$10,529	\$12,565	\$23,095
2. Calibrate and Validate Base Year	0.4	0.0	12.0	0.0	0.0	12.4	\$20,662	\$24,657	\$45,319
3. Model Year of Opening Scenarios	0.4	0.0	14.0	0.5	0.0	14.9	\$24,642	\$29,408	\$54,050
4. Model Horizon Year Scenarios	0.4	0.0	14.0	0.0	0.0	14.4	\$23,969	\$28,605	\$52,574
5. Perform Air Quality Analyses	0.1	0.0	0.0	0.0	3.5	3.6	\$4,606	\$5,496	\$10,102
6. Perform Environmental Justice Analyses	0.1	0.0	0.0	0.0	3.5	3.6	\$4,606	\$5,496	\$10,102
7. Develop Inputs for Economic Impact Analysis	0.2	0.0	2.0	0.0	0.0	2.2	\$3,769	\$4,498	\$8,267
8. Documentation	1.1	0.2	1.0	0.0	0.0	2.3	\$4,327	\$5,164	\$9,491
Total	3.9	0.2	48.0	0.5	7.0	59.6	\$97,110	\$115,891	\$213,000

<b>Other Direct Costs</b>	<b>\$0</b>
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<b>TOTAL COST</b>	<b>\$213,000</b>
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**Funding**  
 Future MBTA Contract



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)

**By Telephone:**

857.702.3700 (voice)

For people with hearing or speaking difficulties, connect through the state MassRelay service:

- **Relay Using TTY or Hearing Carry-over:** 800.439.2370
- **Relay Using Voice Carry-over:** 866.887.6619
- **Relay Using Text to Speech:** 866.645.9870

For more information, including numbers for Spanish speakers, visit <https://www.mass.gov/massrelay>.