



## **WORK PROGRAM**

### **ESTIMATING AVOIDED CARBON EMISSIONS**

APRIL 16, 2026

#### **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) 2026 UPWP

**Project Number** 14383

##### **Client**

Massachusetts Bay Transportation Authority (MBTA)

*Client Supervisor: Kat Eshel*

##### **Project Supervisors**

*Principal: Rebecca Morgan*

*Manager: Rose McCarron*

##### **Funding Source**

MBTA Contract

#### **Schedule and Budget**

**Schedule:** 12 months from notice to proceed

**Budget:** \$168,000

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

#### **Relationship to MPO Goals**

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

Transit service is a vital element of a sustainable transportation system. In 2012, the Boston Region MPO conducted a study using travel demand modeling tools to estimate the amount of carbon emissions avoided through MBTA operations. In recent years, the American Public Transportation Association (APTA)<sup>1</sup> and the Transit Cooperative Research Program (TCRP)<sup>2</sup> have developed new methods to evaluate the avoided carbon emissions due to transit. This study aims to build upon this body of research and leverage updated tools and methods to quantify the impact of the MBTA's transit operations in avoiding potential carbon emissions and support strategic communications about the value of transit services.

## Objectives

1. Estimate the carbon emissions avoided by reduced personal vehicle and rideshare use
2. Estimate the carbon emissions avoided by land use patterns enabled by MBTA transit services
3. Understand how different services and modes contribute to avoiding carbon emissions
4. Project carbon emission reductions associated with hypothetical MBTA service and operation changes

## Work Description

### **Task 1 Estimate Avoided Emissions from Existing Transit Operations**

Staff will review previous research on the impact of transit service on preventing potential carbon emissions. Staff will develop a methodology that incorporates best practices and the best available data and tools to develop estimates of carbon emissions avoided by the operation of existing MBTA service.

#### ***Subtask 1.1 Estimate Avoided Personal Vehicle Emissions***

Staff will develop estimates of vehicle emissions that are avoided due to people using transit rather than a personal vehicle.

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<sup>1</sup> American Public Transportation Association, Quantifying Greenhouse Gas Emissions from Transit, APTA SUDS CC-RP-001-09, Rev. 1 (Washington, DC: American Public Transportation Association, 2018), [https://www.apta.com/wp-content/uploads/Standards\\_Documents/APTA-SUDS-CC-RP-001-09\\_Rev-1.pdf](https://www.apta.com/wp-content/uploads/Standards_Documents/APTA-SUDS-CC-RP-001-09_Rev-1.pdf).

<sup>2</sup> National Academies of Sciences, Engineering, and Medicine, An Update on Public Transportation's Impacts on Greenhouse Gas Emissions (Washington, DC: The National Academies Press, 2021), <https://doi.org/10.17226/26103>.

***Subtask 1.2 Estimate Avoided Emissions due to Land Use Efficiency***

Staff will develop estimates of vehicle emissions that are avoided due to existing land use patterns that are enabled by existing MBTA service.

***Products of Task 1***

Estimates of avoided personal vehicle emissions

Estimates of avoided emissions due to land use efficiency

Technical documentation of the existing service analysis detailing the methodology, assumptions, and findings

**Task 2 Estimate Avoided Emissions from Future Transit Operations**

Staff will develop estimates of carbon emissions that would be avoided by future transit service at the mode level and, if possible, at the line level to inform projected benefits of potential improvements to existing service.

***Products of Task 2***

Estimates of avoided emissions due to potential future transit service improvements

Technical documentation of the future service analysis detailing the methodology, assumptions, and findings

**Task 3 Document and Communicate Research**

Staff will develop a comprehensive final report that details the project's methodologies, data sources, assumptions, and findings. Staff will also provide datasets with accompanying documentation. In addition, staff will develop a slide deck that includes graphics and data visualizations to support communication about the project and its findings.

***Products of Task 3***

Datasets with documentation

Project slide deck

Final report

**Exhibit 1**  
**ESTIMATED SCHEDULE**  
**Estimating Avoided Carbon Emissions**

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Estimate Avoided Emissions from Existing Transit Operations	A			B			C					
2. Estimate Avoided Emissions from Future Transit Operations						D		E				
3. Document and Communicate Research							F			G		H

**Products/Milestones**

- A: Estimates of avoided personal vehicle emissions
- B: Estimates of avoided emissions due to land use efficiency
- C: Technical documentation of existing service analysis
- D: Estimates of avoided emissions due to potential future transit service improvements
- E: Technical documentation of future service analysis
- F: Datasets with documentation
- G: Project slide deck
- H: Final report

**Exhibit 2**  
**ESTIMATED COST**  
**Estimating Avoided Carbon Emissions**

**Direct Salary and Overhead** **\$168,000**

Task	Person-Weeks by Pay Grade						Direct Salary	Overhead (122.59%)	Total Cost
	G-9	G-8	G-7	G-6	G-5	Total			
1. Estimate Avoided Emissions from Existing Transit Operations	1.0	1.0	1.0	24.0	0.0	27.0	\$44,613	\$54,692	\$99,305
2. Estimate Avoided Emissions from Future Transit Operations	0.5	0.5	1.0	6.0	0.0	8.0	\$13,873	\$17,007	\$30,880
3. Document and Communicate Research	1.0	2.5	0.5	4.0	1.0	9.0	\$16,988	\$20,826	\$37,815
<b>Total</b>	<b>2.5</b>	<b>4.0</b>	<b>2.5</b>	<b>34.0</b>	<b>1.0</b>	<b>44.0</b>	<b>\$75,475</b>	<b>\$92,525</b>	<b>\$168,000</b>

**Other Direct Costs** **\$0**

**TOTAL COST** **\$168,000**

**Funding**  
 MBTA Contract

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