BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Monica Tibbits-Nutt, MPO Chair | Secretary and CEO, Massachusetts Department of Transportation
Tegin Leigh Teich, Executive Director, MPO Staff

WORK PROGRAM

EXPLORATION OF INFRASTRUCTURE CHANGES ON VEHICLE-MILES TRAVELED

JUNE 6, 2024

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 13822

Client

Massachusetts Bay Transportation Authority
Client Supervisor: Jay Jackson

Project Supervisors

Principal: Steven Andrews
Manager: Rose McCarron

Funding Source

MassDOT-Directed PL Funds

Schedule and Budget

Schedule: 12 months from notice to proceed

Budget: $90,000

Schedule and budget details are shown in Exhibits 1 and 2, respectively. This project is scheduled to be started in federal fiscal year (FFY) 2024 and completed in FFY 2025.

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

State and local governments are in the process of prioritizing the safety and sustainability of our transportation systems. The ways we allocate and use our public land for transportation is closely tied to these priorities. As changes to the built environment are considered, such altering existing roadway space, understanding and quantifying the potential effects of these changes will give policymakers, engineers, planners, and the public useful information about how their decisions affect mobility and the safety of people using the transportation network.

One way that roadway space can be reconfigured is by replacing some general-purpose travel lanes and underutilized on-street parking lanes with bus lanes. Buses travelling in congested general-purpose lanes have less predictable travel time. Providing buses, and their passengers, with their own travel lanes eliminates a major source of travel time variance, allowing the buses to better adhere to schedules and enhancing the experience of transit users. Another way is to create dedicated space for protected bicycle facilities that will serve as an avenue for people on bicycles to travel safely and efficiently, making bicycling attractive to people of a wider range of ages and abilities.

While these infrastructure changes would produce clear benefits to transit users and bicyclists, travelers using autos would need to choose whether to share a smaller amount of roadways space with other motorists, shift their travel to an alternative time of day, path or mode, or refrain from making a trip—thereby decreasing the number of vehicles on the auto lanes.

The Massachusetts Bay Transportation Authority (MBTA) is currently partnering with Replica, a transportation data provider, to develop insights into how vehicle activity, specifically vehicle-miles traveled (VMT), changes when roadway space is reallocated to support bus-only lanes. Replica uses a variety of data sources, including location-based data, demographics, economic activity, and traffic counts, to create a synthetic model of peoples' travel behaviors. The model results contain demographic information on households, and travel modes and paths that people choose. This highly disaggregate dataset allows planners to ask questions about how people may have shifted their trips based on changes to the built environment.

Boston Region MPO staff will take the work that Replica and the MBTA have done to date and explore the topic in greater detail—expanding the scope and adjusting the methodology to gain further insights into the relationship between changes in the allocation of roadway space and travel patterns. This research aims to give planners and the public more information about how changes will affect peoples' decisions to travel along the roadway.

Objective

The objective of this work is to extend research on the relationship between the allocation of roadway space, particularly a shift from a general-purpose lane to a bus lane, and changes to VMT. The major results are expected to give planners tools to report and communicate the broader impacts of reallocating roadway space.

Work Description

This work will take place in three general steps: reviewing work completed by Replica and the MBTA with a focus on identifying opportunities to expand the research, expanding the work, and documenting and sharing the results and findings.

Task 1 Review Replica's Research and Methods

The team at Replica is currently developing a framework that will underpin much of this research. The MBTA, the Massachusetts Department of Transportation's Office of Performance Management and Innovation (OPMI), and the team at Replica are currently collaborating on a research paper to be submitted for publication. Replica has committed to sharing the methodology and associated scripts to help its partners extend the research. Staff will review the methodology with special attention on opportunities to meaningfully extend this work.

Products of Task 1

An internal research plan that describes candidate strategies for extending the work based on the research materials received

Task 2 Explore and Expand Roadway Reallocation Research

Initial work performed by Replica largely paves the way for the data analysis to be completed. Replica's work explores the relationship between VMT and roadway reallocation for bus lanes in aggregate across the MBTA service area. The MPO staff will build upon this research to develop a more nuanced understanding of travel behavior changes by modifying portions of the existing methodology, for example, by changing the shape or structure of the analysis areas, dividing the analysis into smaller time blocks, or examining the sociodemographic patterns.

Throughout the process, staff will document the processes and methods used to complete the analysis.

Products of Task 2

Documentation of the process and datasets

Analysis of the relationship between roadway reallocation and VMT

Task 3 Documentation of the Results

The results of this work are expected to be of special use for local and regional planners who are making decisions about how to allocate roadway space. The output may help planners communicate how VMT changes as bus lanes are implemented. The results of this study will be formatted for a technical memorandum.

Products of Task 3

Technical memorandum

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Exhibit 1
ESTIMATED SCHEDULE
Exploration of Infrastructure Changes on Vehicle Miles Traveled (VMT)

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Review Replica's Research and Methods												
2. Explore and Expand Roadway Reallocation Research												
3. Documentation of the Results										A		B

Products/Milestones

A: Documentation

B: Technical memorandum

Exhibit 2
ESTIMATED COST
Exploration of Infrastructure Changes on Vehicle Miles Traveled (VMT)

Direct Salary and Overhead	**$90,000**

Task	Person-Weeks by Pay Grade					Direct Salary	Overhead (120.3%)	Total Cost
	G-9	G-8	G-7	G-6	Total			
1. Review Replica's Research and Methods	0.2	0.4	1.0	1.2	2.8	$4,952	$5,958	$10,910
2. Explore and Expand Roadway Reallocation Research	0.2	0.4	4.4	11.2	16.2	$25,877	$31,130	$57,007
3. Documentation of the Results	0.0	0.4	3.2	2.1	5.7	$10,024	$12,059	$22,083
Total	0.4	1.2	8.6	14.5	24.7	$40,854	$49,147	$90,000

Other Direct Costs	**$0**

TOTAL COST	**$90,000**

Funding

MassDOT Directed-PL