



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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WORK PROGRAM

NEW AND EMERGING METRICS FOR ROADWAY USAGE

NOVEMBER 8, 2018

Proposed Motion

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

Project Identification

Unified Planning Work Program (UPWP) Classification

Boston Region MPO Planning Studies and Technical Analyses

Project Number 13290

Client

Boston Region MPO

Project Supervisors

Principal: Mark Abbott

Manager: Ryan Hicks

Funding Source

MPO Planning Contract #105757 and MPO §5303 Contract #102694

Schedule and Budget

Schedule: 11 months after work commences

Budget: \$60,000

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

Relationship to MPO Goals

The Boston Region MPO elected to fund this study with its federally allocated metropolitan planning funds during federal fiscal year (FFY) 2019. The work completed through this study will address the following goal areas established in the MPO's Long-Range Transportation Plan (LRTP): safety, capacity management and mobility, transportation equity, and economic vitality.

Background

The Boston Region MPO engages in transportation performance monitoring through several MPO activities, such as the LRTP, the Congestion Management Process (CMP), and the Transportation Improvement Program. The Boston region is comprised of a modally diverse transportation network and includes the following:

- Extensive arterial and expressway networks
- 8 rapid transit lines
- 13 commuter rail lines
- 4 ferry routes
- 182 bus and bus rapid transit routes
- Numerous bike lanes and pedestrian walkways

The MPO conducts performance monitoring on these modes; however, many performance measures focus on monitoring vehicle performance rather than the mobility of motorists, transit riders, bicyclists, and pedestrians.

Because of the varying characteristics of the networks, multimodal performance measures should be applied to measure congestion as it affects the mobility of motorists, transit riders, bicyclists, and pedestrians. Convenience and burdens of different transportation modes could be analyzed. One way to accomplish this is to compare the advantages and disadvantages in travel time when driving to travel time when riding public transportation on roadways.

MPO staff will conduct a study that will propose a method to measure multimodal travel as it relates to the mobility of motorists, transit riders, bicyclists, and pedestrians. Staff will compile the research from the study into a memo that will also provide recommendations. The study results will then be presented to the Boston Region MPO board.

Objectives

In accordance with the LRTP goals listed above, it is desirable to improve the MPO's performance monitoring efforts with regards to mobility of motorists, transit riders, bicyclists, and pedestrians. An important task is to determine and implement performance measures that are useful for monitoring multimodal uses on a corridor by using a common modal scale, which will work towards the LRTP goal of Capacity Management and Mobility. Each mode (for example, highway, rapid transit, and commuter rail) will be scored separately for each performance measure. The objectives are as follows:

1. Determine performance measures that can assess multiple modes and quantify the mobility of motorists, transit riders, bicyclists, and pedestrians rather than vehicles.

2. Determine a plan for the selected performance measures to be considered for the CMP and the LRTP, among other MPO activities.

Work Description

Task 1 Research Previously Studied Multimodal Performance Monitoring

Staff will conduct a literature review on studies that have already researched multimodal performance monitoring. Previous studies completed by other MPOs, state departments of transportation, educational institutions, and other transportation agencies will be compared for best practices and to determine which performance measures are most useful to apply to the current study. This literature review will be included as part of the final memorandum, and may include a pros-and-cons section and a checklist for each study.

Product of Task 1

- A literature review that will be included in the final memorandum that shows best practices from other MPOs, communities, and transportation agencies.

Task 2 Research Data Availability

Recommending performance measures that use data that are accessible is an important part of the process. Staff will conduct research to identify data are available to the MPO. Staff will inventory relevant datasets to determine if they are available and whether or not these datasets are up to date.

Products of Task 2

- Inventory of datasets that are available to the MPO
- Inventory of the performance measures that can be used to monitor the transportation network

Task 3 Conduct Outreach to Help Select Performance Measures

The MPO staff will conduct outreach prior to selecting performance measures. Outreach efforts may include interviewing transportation professionals and conducting an online survey. MPO staff will create a nonscientific survey and distribute it to transportation professionals, including professionals affiliated with the Massachusetts Department of Transportation – including the Office of Performance Management and Innovation – local municipalities, and academic institutions. Staff will distribute the survey online using Survey Monkey or an equivalent service to as many as 20 participants and will seek both choice-based and subjective feedback.

Products of Task 3

- Online survey distributed to policy groups and advocates in the transportation field (selected professionals will not be restricted to the Boston region)

- Results of the online survey

Task 4 Apply Performance Measures to Selected Corridors

Staff will select as many as four corridors on which to apply and evaluate performance measures. These will be multimodal corridors with diverse characteristics and highway, transit, bicycle, and pedestrian traffic. The selected corridors should be of a sufficient length through which users drive, bicycle, walk, and take public transit. Including several types of corridors will show variations that the performance measures will have on different corridors. Corridors previously studied in Traffic Analysis and Design group planning studies may also be selected for analysis.

Once staff have selected corridors, they will apply performance measures identified from the research and the survey in selected corridors to test suitability for use in MPO programs. Staff will evaluate a maximum of 20 performance measures during this study. In this analysis, staff will apply the performance measures to the location of the selected corridors to see if they are suitable for monitoring multimodal person movement on roadways. Staff will note the performance measures that best reflect real-life conditions of the transportation network. In addition, it may be necessary to apply factors to adjust performance measures. Staff will also identify thresholds for each performance measure during this task. The results of the test runs will be documented in the final memorandum.

Products of Task 4

- A list of as many as four corridors in the Boston region that will be evaluated, including the characteristics of the corridors and the reasons the corridors were selected
- Results of the performance measure test (documented in the final memorandum)

Task 5 Evaluate and Finalize Performance Measures

Staff will create a final list of performance measures based on data availability, results of the survey, and test results of the performance measures.

Product of Task 5

- List of performance measures that will be used for this study

Task 6 Document Findings

Staff will document findings about the research of multimodal performance measures in a memorandum that will be presented to the Boston Region MPO board. Though not required, performance targets may be developed for these performance measures in the future.

Products of Task 6

- A memorandum that will detail the findings of this study
- Performance metrics that will measure multimodal performance throughout the Boston region and that could be considered for adoption by the MPO and used in future studies

Exhibit 1
ESTIMATED SCHEDULE
New and Emerging Metrics for Roadway Usage

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	
1. Research Previously Studied Multimodal Performance Monitoring	[]											
2. Research Data Availability		[]										
3. Conduct Outreach to Help Select Performance Measures			[]									
4. Apply Performance Measures to Selected Corridors				[]								
5. Evaluate and Finalize Performance Measures							[]					
6. Document Findings									[]			

Exhibit 2
ESTIMATED COST
New and Emerging Metrics for Roadway Usage

Direct Salary and Overhead									\$60,000
Task	Person-Weeks					Direct Salary	Overhead (99.00%)	Total Cost	
	M-1	P-5	P-4	P-3	Total				
1. Research Previously Studied Multimodal Performance Monitoring	0.2	0.8	1.8	0.0	2.8	\$4,478	\$4,433	\$8,911	
2. Research Data Availability	0.2	0.8	1.0	0.0	2.0	\$3,350	\$3,317	\$6,667	
3. Conduct Outreach to Help Select Performance Measures	0.2	0.0	1.1	0.4	1.7	\$2,374	\$2,350	\$4,724	
4. Apply Performance Measures to Selected Corridors	0.7	1.7	2.6	0.2	5.2	\$8,488	\$8,403	\$16,891	
5. Evaluate and Finalize Performance Measures	0.5	0.4	0.8	0.2	2.0	\$3,179	\$3,147	\$6,326	
6. Document Findings	2.7	0.0	2.0	0.4	5.1	\$8,282	\$8,199	\$16,481	
Total	4.5	3.7	9.3	1.2	18.7	\$30,151	\$29,849	\$60,000	
Other Direct Costs									\$0
TOTAL COST									\$60,000

Funding

MPO Planning Contract #105757

MPO §5303 Contract #102694 and subsequent MPO §5303 contract