



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Stephanie Pollack, MassDOT Secretary and CEO and MPO Chair
Karl H. Quackenbush, Executive Director, MPO Staff

MEMORANDUM

DATE October 19, 2017
TO Boston Region Metropolitan Planning Organization
FROM Karl H. Quackenbush, Executive Director
RE Work Program for Travel Alternatives to Regional Traffic Bottlenecks

Action Required

Review and approval

Proposed Motion

That the Boston Region Metropolitan Planning Organization (MPO) votes to approve the work program for Travel Alternatives to Regional Traffic Bottlenecks presented in this memorandum

Project Identification

Unified Planning Work Program Classification

Planning Studies and Technical Analysis

CTPS Project Number

13285

Clients

Boston Region Metropolitan Planning Organization

CTPS Project Supervisors

Principal: Mark Abbott

Manager: Ryan Hicks

Funding

MPO Planning Contract #101725

MPO §5303 Contract #98873 and subsequent MPO §5303 contract

Impact on MPO Work

This is MPO work and will be carried out in conformance with the priorities established by the MPO.

Background

Of all of the important activities that the Boston Region MPO staff performs for its member communities, one of the most important is the development of the Congestion Management Process (CMP). In addition, the CMP is required by federal law. The main goal of the CMP is to identify recurring congestion during the AM and PM peak period. The Boston region has several unique characteristics that stand out from other metropolitan areas nationally:

- A large population of college students, as more than 360,000 college students live in the Boston region¹
- A large number of tourists and tourist attractions, as Boston is often listed in the media as one of the top 20 cities visited in the United States
- Close proximity to popular vacation locations such as Martha's Vineyard and Cape Cod, making the Boston region a launching point for vacations
- Three professional sports teams in downtown, one in the suburbs, and many college teams that compete nationally
- A desirable location to host concerts, festivals, and other events
- An older transportation system and established land uses that make it difficult to expand many portions of the roadway network

As a result of these unique characteristics, the Boston region may experience congestion outside of the traditional peak periods and at locations that are not necessarily leading to a central business district. This study would go beyond the CMP requirements and determine locations and times that traffic congestion is occurring outside of the peak period. The anticipated result of this project is to provide a handbook of strategies to identify and mitigate nonrecurring congestion.

Objective

The objective for this project is to identify nonrecurring automobile and roadway freight congestion patterns on freeways and major arterials near activity centers in the Boston region, and to recommend strategies to alleviate the congestion. Nonrecurring congestion is typically caused by alternative events, which are defined as sporting events, concerts, festivals, construction, inclement weather, and holidays.

¹ Denis M. McSweeney and Walter J. Marshall. "The prominence of Boston area colleges and universities. 2009. <https://www.bls.gov/opub/mlr/2009/06/regrep.pdf> (accessed October 4, 2017)

This project aims to achieve two related objectives that are stated in the Boston Region MPO Long-Range Transportation Plan (LRTP):² 1) Support community-based and private-initiative services and programs to meet last-mile, reverse commute, and other nontraditional transit/transportation needs, including those of the elderly and persons with disabilities and 2) respond to the mobility needs of the 25- to 34-year-old workforce (since these demographics are both a significant share of the Boston region's population and are commonly adversely affected by nonrecurring congestion). The reason that these objectives are emphasized is because objectives strive towards achieving the LRTP goals of Capacity Management/Mobility, which focuses on using existing capacity more efficiently, and increasing healthy transportation capacity and Economic Vitality, which focuses on ensuring that our transportation network provides a strong foundation for economic vitality.

Work Description

Task 1 Evaluate and Select Data Sources

The Boston Region MPO has access to several vehicle probe data sets that provide sufficient coverage for this project. One option is the 2015 INRIX data set, which contains extensive data about weekend and special events. Another option is the National Performance Management Research Data Set (NPMRDS), which is provided monthly to MPOs by the Federal Highway Administration (FHWA). The NPMRDS contains a subset of data that monitors freight traffic on roadways. A combination of data sets may be used for this project, if applicable. Other data sets that are accessible by the Boston MPO will be considered for inclusion with this project.

Products of Task 1

- Relevant data sets selected for this project. Minimum requirements for the data records for each data set will be defined in this task.

Task 2 Select Performance Measures

There are several CMP and roadway freight performance measures that are used to monitor the roadway network. These CMP performance measures have been in use by the Boston Region MPO for the last several years. In addition, the FHWA and the Boston Region MPO are showing an increasing presence of freight monitoring by using performance measures to monitor freight congestion. This freight presence is increasing as on-time delivery for freight transport becomes more important to the US economy.

² "Charting Progress to 2040: A Long-Range Transportation Plan for the Boston Region", 2015. <http://www.ctps.org/lrtp> (accessed October 4, 2017)

Staff will select several CMP and roadway freight performance measures that will be used specifically to determine the duration, intensity, and variability of congestion at the selected locations. Performance measures that were created by the FHWA to monitor the National Highway System will also be considered for inclusion for this project.

Products of Task 2

- A list and description for each performance measure that will be used for this project. The description will include the formula and data used to calculate each performance measure.

Task 3 Identify Alternative Events

Alternative events that occur in the Boston region, both during the week and on weekends, will be identified, and their effects on congestion will be examined locally and regionally. Congested conditions at the time of the alternative events will be compared to traditional peak periods and free-flow periods. Possible alternative events include, but are not limited to, sporting events, concerts, festivals, construction, inclement weather, and holidays. Data for the times and locations of each of these events are readily available from various online sources.

Product of Task 3

- Identification of dates and times for alternative events will be analyzed for this study

Task 4 Determine Bottleneck Locations

The data set(s) that were selected in Task 1 will be used to determine the locations that have nonrecurring congestion or bottlenecks, using the performance measures selected in Task 2. This task will also determine the final number of locations to be analyzed for this project.

Product of Task 4

- A list of potential bottlenecks that have nonrecurring congestion will be provided. Traffic Messaging Channel (TMC) line work, which represents the roadways to be analyzed, will be documented so that the roadway segments can be quickly selected for each additional analysis.

Task 5 Document Methodology, Findings, and Recommendations

The MPO staff will produce a final memorandum of the study's tasks and products. This memorandum will have three sections documenting the locations, strategies, and recommendations for the nonrecurring congestion. Specific recommendations of strategies to alleviate the nonrecurring congestion will be included.

Product of Task 5

- A memorandum that details the locations of nonrecurring congestion, the definition of congestion mitigation strategies, and the recommendation of strategies at each location.

Estimated Schedule

It is estimated that this project will be completed 12 months after work commences. The proposed schedule, by task, is shown in Exhibit 1.

Estimated Cost

The total cost of this project is estimated to be \$70,000. This includes the cost of 22.7 person-weeks of staff time, overhead at the rate of 105.66% percent. A detailed breakdown of estimated costs is presented in Exhibit 2.

KQ/MSA/rh

Exhibit 1
ESTIMATED SCHEDULE
Travel Alternatives to Regional Traffic Bottlenecks

Task	Month												
	1	2	3	4	5	6	7	8	9	10	11	12	
1. Evaluate and Select Data Sources	█												
2. Select Performance Measures			█										
3. Identify Alternative Events				█									
4. Determine Bottleneck Locations						█							
5. Document Methodology, Findings, and Recommendations									█				

Exhibit 2
ESTIMATED COST
Travel Alternatives to Regional Traffic Bottlenecks

Direct Salary and Overhead	\$70,000
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Task	Person-Weeks				Direct Salary	Overhead (105.66%)	Total Cost
	M-1	P-5	P-4	Total			
1. Evaluate and Select Data Sources	0.2	1.0	2.0	3.2	\$5,060	\$5,346	\$10,406
2. Select Performance Measures	0.0	0.0	1.5	1.5	\$2,088	\$2,207	\$4,295
3. Identify Alternative Events	0.2	0.2	2.0	2.4	\$3,537	\$3,737	\$7,274
4. Determine Bottleneck Locations	0.4	0.4	2.0	2.8	\$4,289	\$4,532	\$8,821
5. Document Methodology, Findings, and Recommendations	2.0	0.5	10.3	12.8	\$19,062	\$20,141	\$39,204
Total	2.8	2.1	17.8	22.7	\$34,037	\$35,963	\$70,000

Other Direct Costs	\$0
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TOTAL COST	\$70,000
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Funding

MPO Planning Contract #101725
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