



# BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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The Boston Region MPO is  
composed of:

Massachusetts Department of  
Transportation

Metropolitan Area Planning Council

Massachusetts Bay Transportation  
Authority Advisory Board

Massachusetts Bay Transportation  
Authority

Massachusetts Port Authority

Regional Transportation Advisory  
Council

City of Boston

City of Beverly

City of Everett

City of Newton

City of Somerville

City of Woburn

Town of Arlington

Town of Bedford

Town of Braintree

Town of Framingham

Town of Lexington

Town of Medway

Town of Norwood

Federal Highway Administration  
(nonvoting)

Federal Transit Administration  
(nonvoting)

## MEMORANDUM

**DATE** November 17, 2011  
**TO** Boston Region Metropolitan Planning Organization  
**FROM** Karl H. Quackenbush  
CTPS Executive Director  
**RE** Work Program for: 2011-2012 HOV Monitoring on I-93 North and the  
Southeast Expressway

### ACTION REQUIRED

Review and approval

### PROPOSED MOTION

That the Boston Region Metropolitan Planning Organization, upon the recommendation of the Massachusetts Department of Transportation, vote to approve the work program for 2011-2012 HOV Monitoring on I-93 North and the Southeast Expressway in the form of the draft dated November 17, 2011.

### PROJECT IDENTIFICATION

#### Unified Planning Work Program Classification

Planning Studies

#### CTPS Project Number

23227

#### Client

Massachusetts Department of Transportation, Office of Transportation  
Planning

*Project Supervisor:* Bob Frey

#### CTPS Project Supervisors

*Principal:* Efi Pagitsas

*Manager:* Seth Asante

#### Funding

MassDOT SPR Contract #68456

## **IMPACT ON MPO WORK**

The MPO staff has sufficient resources to complete this work in a capable and timely manner. By undertaking this work, the MPO staff will neither delay the completion of nor reduce the quality of other work in the UPWP.

## **BACKGROUND**

In 1998, the Massachusetts Department of Environmental Protection (DEP) began requiring monitoring of the Southeast Expressway and I-93 North general-purpose and high-occupancy-vehicle (HOV) lanes to determine HOV performance. The requirements are set forth in DEP regulation 310 CMR 7.37, which calls for travel time data to be collected seasonally throughout the year, including samples for each of the five weekdays. This work scope provides for the continuation of this process and documents the projected tasks, products, scheduling, and costs of HOV monitoring for 2011-2012.

## **OBJECTIVE(S)**

The objectives of this work are:

- To collect travel time data on the I-93 North and Southeast Expressway HOV lane segments and their associated general-purpose lane segments during the fall of 2011 and the winter, spring, and summer of 2012.
- To collect AM period vehicle occupancy counts on the I-93 North and Southeast Expressway HOV lane segments and their associated general-purpose lane segments during the fall of 2011 and the spring of 2012.
- To calculate travel times and vehicle occupancy in both the HOV and general-purpose lanes and travel time savings in the HOV lanes throughout this 2011-2012 period.
- To analyze and document the results in written and graphic formats.

## **WORK DESCRIPTION**

The work required to accomplish the study objectives will be carried out in four tasks, as described below:

**Task 1 Collect Travel Time Data**

CTPS will collect sample travel time data using stopwatches and Global Positioning System (GPS) satellite receivers in rented automobiles on the I-93 North and Southeast Expressway HOV and general-purpose lanes. The collection hours are between 6:00 and 10:00 AM on I-93 North southbound and the Southeast Expressway northbound and between 3:00 and 7:00 PM on the Southeast Expressway southbound. Data will be collected over the course of four quarters throughout the year, beginning in the fall of 2011.

***Products of Task 1***

Travel time data for the general-purpose and HOV lanes in electronic form and on handwritten field notes.

**Task 2 Process and Analyze Travel Time Data**

CTPS will process the travel time data, and analyze it, and document results in tables and graphs. Staff will estimate the travel-time savings afforded by the HOV lanes compared to travel in the general-purpose lanes for each of the four seasons as well as the entire year.

***Products of Task 2***

Four sets of tables and graphs presenting seasonal estimates of travel time, and HOV travel time savings for I-93 North during the AM period and for the Southeast Expressway during the AM and PM periods.

**Task 3 Collect Vehicle Occupancy Data**

CTPS will collect vehicle occupancy data on both the I-93 North and Southeast Expressway HOV lanes and their associated general-purpose lanes on a typical weekday during the fall of 2011 and again during the spring of 2012. Data will be collected throughout the four hours of AM HOV operation.

***Products of Task 3***

Total numbers of vehicles and their occupants, grouped by 15-minute intervals, on a typical weekday during the spring and fall for each of the two HOV and seven general-purpose lanes under study.

**Task 4 Document Travel Time Savings**

The data collected in Task 1 and analyzed in Task 2 will be used to produce five technical memoranda documenting HOV lane performance. The occupancy data collected in Task 3 will be reported in two of those memos and include a calculation of the total vehicles

and persons and the vehicle occupancy rate for the I-93 North and Southeast Expressway HOV and general-purpose lanes.

***Products of Task 4***

- Four memos documenting the most recent performance of the HOV lanes by season (fall, winter, spring, and summer). The spring and fall memos will also include the results of vehicle occupancy counts.
- A fifth memo generated at the end of the project year, documenting the year's performance of the HOV lanes.

**ESTIMATED SCHEDULE**

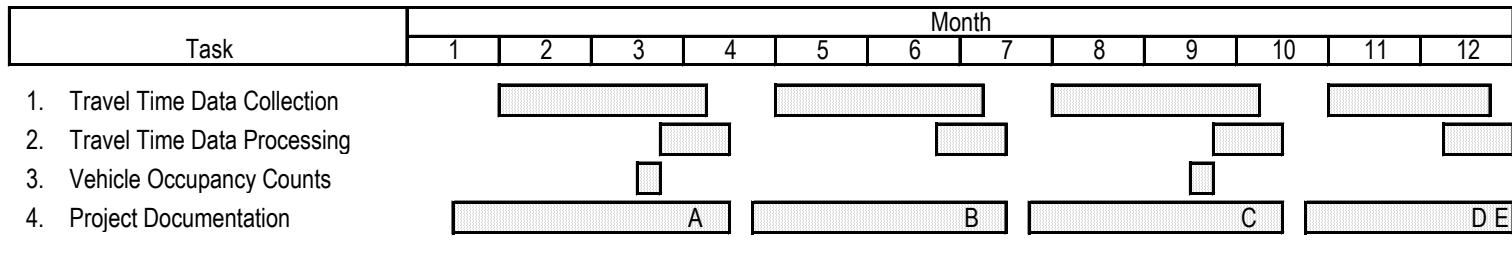
It is estimated that this project will be completed 12 months after the notice to proceed is received. The proposed schedule, by task, is shown in Exhibit 1.

**ESTIMATED COST**

The total cost of this project is estimated to be \$62,000. This includes the cost of 40.5 person-weeks of staff time, overhead at the rate of 94.57 percent and travel. A detailed breakdown of estimated costs is presented in Exhibit 2.

KHQ/SAA/saa

**Exhibit 1**  
**ESTIMATED SCHEDULE**  
**2011-2012 HOV Monitoring on I-93 North and Southeast Expressway**



**Products/Milestones**

- A: Memo documenting fall 2011 travel times and vehicle occupancy
- B: Memo documenting winter 2011-2012 travel times
- C: Memo documenting spring 2012 travel times and vehicle occupancy
- D: Memo documenting summer 2012 travel times
- E: Memo documenting annual travel times and vehicle occupancy

Exhibit 2  
**ESTIMATED COST**  
**2011-2012 HOV Monitoring on I-93 North and Southeast Expressway**

<b>Direct Salary and Overhead</b>	<b>\$55,063</b>
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Task	Person-Weeks					Direct Salary	Overhead (@ 94.57%)	Total Cost
	M-1	P-5	P-1	Temp	Total			
1. Travel Time Data Collection	0.0	0.5	1.5	21.5	23.5	\$12,337	\$11,667	\$24,005
2. Travel Time Data Processing	0.0	2.0	2.0	2.0	6.0	\$5,753	\$5,441	\$11,194
3. Vehicle Occupancy Counts	0.0	1.0	1.0	6.0	8.0	\$5,291	\$5,003	\$10,294
4. Project Documentation	1.0	2.0	0.0	0.0	3.0	\$4,919	\$4,652	\$9,570
Total	1.0	5.5	4.5	29.5	40.5	\$28,300	\$26,763	\$55,063

<b>Other Direct Costs</b>	<b>\$6,937</b>
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Travel	\$6,937
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<b>TOTAL COST</b>	<b>\$62,000</b>
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**Funding**  
 MassDOT SPR Contract #68456