



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Richard A. Davey, MassDOT Secretary and CEO and MPO Chairman
Karl H. Quackenbush, Executive Director, MPO Staff

MEMORANDUM

DATE January 17, 2013
TO Boston Region Metropolitan Planning Organization
FROM Karl H. Quackenbush
CTPS Executive Director
RE Work Program for: FFY 2012–13 I-93 North and Southeast Expressway
HOV Lane Monitoring

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 I-93 North and Southeast Expressway HOV Lane Monitoring in the form of the draft dated January 17, 2013.

Project Identification

Unified Planning Work Program Classification

Planning Studies

CTPS Project Number

23228

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 #72982
New MassDOT SPR Contract TBD

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 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 monitoring 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. Each year since 1998, a work program has provided for the continuation of this process, describing the projected tasks, scheduling, products, and costs of HOV monitoring for an entire year, starting on October 1. However, as MassDOT and MPO staff were originally thought to be transitioning to an alternative data collection method that had not been fully established by early September 2012; a work program for \$17,653 was written and approved on September 6 that covered only the period from October 1, 2012, to December 31, 2012. The present work program is the follow-up work program, covering the same activities, for the period January 1, 2013, to September 30, 2013.

Objectives

The objectives of this work program are to perform the following monitoring and analysis for the period January 1, 2013, to September 30, 2013 (henceforth referred to as the winter, spring, and summer of 2013):

- Collect travel time data on the I-93 North HOV and Southeast Expressway HOV lane segments and their associated general-purpose lane segments.
- Collect AM-peak-period vehicle occupancy counts on the I-93 North and Southeast Expressway HOV lane segments and their associated general-purpose lane segments.
- Calculate travel times and vehicle occupancy in both the HOV and general-purpose lanes and travel time savings in the HOV lanes.
- 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

MPO staff 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 in the winter, spring, and summer of 2013.

Products of Task 1

Winter, spring, and summer 2013 travel time data for the general-purpose and HOV lanes in an electronic format and in handwritten field notes

Task 2 Process and Analyze Travel Time Data

MPO staff will process the travel time data, analyze it, and document the results in a table and graphs. Staff will estimate the travel-time savings afforded by the HOV lanes compared to travel in the general-purpose lanes for the winter, spring, and summer of 2013.

Products of Task 2

A table and set of graphs presenting estimates of winter, spring, and summer 2013 travel times and HOV travel time savings for I-93 North during the AM peak period and for the Southeast Expressway during the AM and PM peak periods

Task 3 Collect and Analyze Vehicle Occupancy Data

MPO staff 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 spring of 2013. Data will be collected throughout the four hours of AM HOV operation. Vehicle occupancies will be calculated and analyzed.

Products of Task 3

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

Task 4 Document Travel Time Savings and Occupancy Rates

The data collected in Task 1 and the analysis of it in Task 2 will be documented in three separate technical memoranda on HOV lane performance for three data collection periods. The occupancy data collected and analyzed in Task 3 will also be reported in the spring memo, which will include a calculation of the total number of vehicles, the number of persons, and the vehicle occupancy rate for

the I-93 North and Southeast Expressway HOV and general-purpose lanes. A fourth memorandum will be generated at the end of the project year, documenting the year's performance of the HOV lanes.

Products of Task 4

Three memoranda documenting the performance of the HOV lanes during the winter, spring, and summer of 2013 in terms of travel time; and a fourth memorandum documenting annual travel times monitored from the fall of 2012 through the summer of 2013 and vehicle occupancy counts for the same time period.

Estimated Schedule

It is estimated that this project will be completed nine 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 \$45,844. This includes the cost of 32.9 person-weeks of staff time, overhead at the rate of 96.58 percent, and travel. A detailed breakdown of estimated costs is presented in Exhibit 2.

KHQ/SAA/saa

Exhibit 1
ESTIMATED SCHEDULE
FFY 2012–13 I-93 North and Southeast Expressway HOV Lane Monitoring

Task	Month								
	1	2	3	4	5	6	7	8	9
1. Collect Travel Time Data		■			■			■	
2. Process and Analyze Travel Time Data			■			■			■
3. Collect and Analyze Vehicle Occupancy Data						■			
4. Document Travel Time Savings and Occupancy Rates		■ A			■ B			■ CD	

Products/Milestones

- A: Memo documenting winter 2013 travel times
- B: Memo documenting spring 2013 travel times and vehicle occupancy counts
- C: Memo documenting summer 2013 travel times
- D: Memo documenting annual travel times and vehicle occupancy counts

Exhibit 2
ESTIMATED COST
FFY 2012–13 I-93 North and Southeast Expressway HOV Lane Monitoring

Direct Salary and Overhead	\$41,019
-----------------------------------	-----------------

Task	Person-Weeks					Direct Salary	Overhead (96.58%)	Total Cost
	M-1	P-5	P-2	Temp	Total			
1. Collect Travel Time Data	0.0	0.5	0.5	24.2	25.2	\$12,976	\$12,532	\$25,508
2. Process and Analyze Travel Time Data	0.0	0.5	0.2	0.8	1.4	\$1,376	\$1,329	\$2,706
3. Collect and Analyze Vehicle Occupancy Data	0.0	0.5	0.5	3.0	4.0	\$2,727	\$2,633	\$5,360
4. Document Travel Time Savings and Occupancy Rates	0.8	1.5	0.0	0.0	2.2	\$3,787	\$3,658	\$7,445
Total	0.8	3.0	1.2	28.0	32.9	\$20,866	\$20,153	\$41,019

Other Direct Costs	\$4,825
---------------------------	----------------

Travel	\$4,825
--------	---------

TOTAL COST	\$45,844
-------------------	-----------------

Funding

MassDOT SPR Contract #72982
 New MassDOT SPR Contract (TBD)