



# BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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MassDOT Secretary and CEO  
and MPO Chairman

Karl H. Quackenbush  
Executive Director, MPO Staff

## MEMORANDUM

**DATE** June 21, 2012

**TO** Boston Region Metropolitan Planning Organization

**FROM** Karl H. Quackenbush  
CTPS Executive Director

**RE** Work Program for: MBTA 2013 National Transit Database:  
Purchased Bus

### ACTION REQUIRED

Review and approval

### PROPOSED MOTION

That the Boston Region Metropolitan Planning Organization, upon the recommendation of the Massachusetts Bay Transportation Authority, vote to approve the work program for MBTA 2013 National Transit Database: Purchased Bus in the form of the draft dated June 21, 2012.

### PROJECT IDENTIFICATION

**Unified Planning Work Program Classification**  
Technical Support/Operations Analysis Projects

**CTPS Project Number**  
14332

**Client**  
Massachusetts Bay Transportation Authority  
*Project Supervisor:* Melissa Dullea

**CTPS Project Supervisors**  
*Principal:* Liz Moore  
*Manager:* Steven Andrews

**Funding**  
Future MBTA contract

### 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)

## **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**

For many years, in support of the MBTA's National Transit Database (NTD) submittals to the Federal Transit Administration (FTA), CTPS has produced passenger-miles and boardings estimates for the MBTA's directly operated services including bus and trackless trolley, heavy rail and light rail, and more recently, commuter rail. Since state fiscal year (SFY) 2001, CTPS has also produced passenger-miles and boardings estimates for the MBTA's purchased-service bus routes (that is, routes for which the MBTA contracts with a private carrier to provide the service).

In SFY 2010, CTPS began collecting full-route ridecheck data for purchased-service bus routes rather than data on a random sampling of trips, as it was determined that the methodology employing full-route ridechecks satisfies the FTA requirement that the true values for passenger-miles and boardings have a 95 percent probability of falling within 10 percent of the estimates. In addition, this methodology provides ridership and schedule adherence data for each purchased bus route that can be used for other planning purposes. In SFY 2013, CTPS will continue to use full-route ridechecks to estimate total passenger-miles and boardings.

## **OBJECTIVE**

To develop estimates of passenger-miles and boardings for bus routes operated as part of the Suburban Transportation Program and all other contracted MBTA local bus service.

## **WORK DESCRIPTION**

The data that will form the basis for the passenger-miles and boardings estimates will be collected through onboard ridechecks. These ridechecks will be conducted as part of the ongoing bus data collection program that CTPS conducts for the MBTA.

### **Task 1 Develop Sampling Plan**

A sampling plan will be developed to conduct full-route ridechecks of each bus route. These ridechecks involve CTPS staff members riding each scheduled trip for each route over the course of a single quarter in SFY 2013. The specific quarter will be determined based on CTPS staffing availability.

#### ***Product of Task 1***

Bus sampling plan and data collectors' assignments

### **Task 2 Collect Data**

CTPS staff members will carry out the assignments created in Task 1. As in the past, the ridecheck data to be collected are boardings and alightings by stop, farebox readings, trip-level travel times, departure and arrival times, and intermediate-stop arrival times.

These data will be collected using mobile devices and uploaded directly to the CTPS bus ridership information database, where they will be checked for completeness and accuracy.

***Product of Task 2***

Ridecheck data in electronic form

**Task 3 Estimate Passenger-Miles and Boardings**

Estimates of passenger-miles and boardings will be produced using revenue data from the MBTA and output from the CTPS bus ridership information database. Specifically, estimates of the average farebox deposit will be generated, along with the average passenger trip length, based on ridecheck observations. By dividing the average farebox deposit into total revenue, an estimate of total boardings may be made. Multiplying this total by the average trip length yields total passenger-miles.

***Product of Task 3***

Estimates of passenger-miles and boardings

**Task 4 Document Results**

The results of Task 3 and the methodology of the study will be documented in a technical memorandum. The memorandum will also discuss the FTA requirement that the true values for passenger-miles and boardings have a 95 percent probability of falling within 10 percent of the estimates. As discussed above, this requirement will be met through the use of the full-route-ridecheck approach rather than the random-sampling approach outlined in FTA Circular 2710.4A.

***Product of Task 4***

A technical memorandum describing the data collection and analysis processes, summarizing results, and discussing FTA's statistical validation requirements

**Task 5 Assist with Compliance Audit**

The FTA requires an independent auditor to review and verify the MBTA's purchased-service bus passenger-miles and boardings estimates. As the agency responsible for these estimates, CTPS will provide any materials and assistance necessary for the audit.

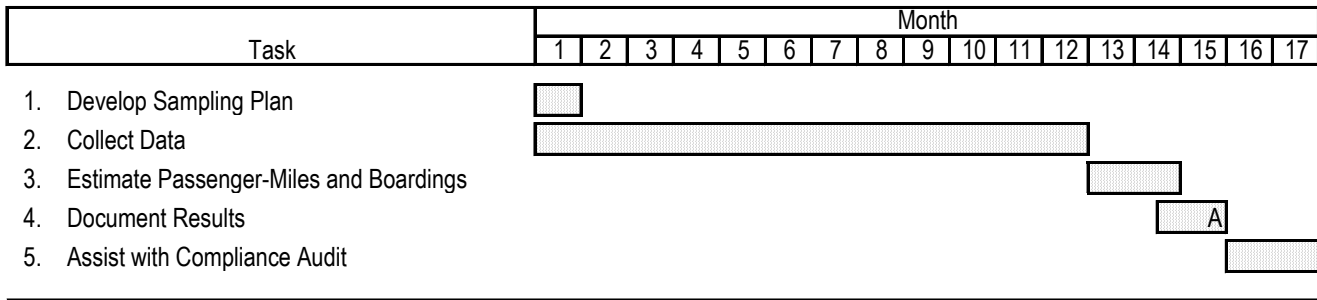
**ESTIMATED SCHEDULE**

It is estimated that this project will be completed approximately 17 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 \$21,578. This includes the cost of 13.8 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.

**Exhibit 1**  
**ESTIMATED SCHEDULE**  
**MBTA 2013 National Transit Database: Purchased Bus**



Products/Milestones

A: Technical memorandum

Exhibit 2  
**ESTIMATED COST**  
**MBTA 2013 National Transit Database: Purchased Bus**

<b>Direct Salary and Overhead</b>	<b>\$20,828</b>
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Task	Person-Weeks							Direct Salary	Overhead (@ 94.57%)	Total Cost
	M-1	P-5	P-3	SP-3	SP-1	Temp	Total			
1. Develop Sampling Plan	0.0	0.7	0.0	0.0	0.0	2.5	3.2	\$2,351	\$2,223	\$4,574
2. Collect Data	0.1	0.0	0.2	2.5	2.5	2.7	8.0	\$5,192	\$4,910	\$10,103
3. Estimate Passenger-Miles and Boardings	0.0	0.0	1.2	0.0	0.0	0.0	1.2	\$1,227	\$1,160	\$2,388
4. Document Results	0.8	0.0	0.5	0.0	0.0	0.0	1.3	\$1,832	\$1,732	\$3,564
5. Assist with Compliance Audit	0.0	0.0	0.1	0.0	0.0	0.0	0.1	\$102	\$97	\$199
Total	0.9	0.7	2.0	2.5	2.5	5.2	13.8	\$10,705	\$10,123	\$20,828

<b>Other Direct Costs</b>	<b>\$750</b>
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Travel	\$750
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<b>TOTAL COST</b>	<b>\$21,578</b>
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**Funding**  
*Future MBTA Contract*