



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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

MEMORANDUM

DATE February 18, 2016
TO Boston Region Metropolitan Planning Organization
FROM Karl H. Quackenbush
CTPS Executive Director
RE Work Program for: MBTA Bus Service Data Collection IX

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 Bus Service Data Collection IX presented in this memorandum

Project Identification

Unified Planning Work Program Classification

Technical Support/Operations Analysis Projects

CTPS Project Number

11406

Client

Massachusetts Bay Transportation Authority
Project Supervisor: Melissa Dullea

CTPS Project Supervisors

Principal: Annette Demchur
Manager: Jonathan Belcher

Funding

Future MBTA Contract

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 any work in the UPWP.

Background

In 1996, CTPS began the Comprehensive Ridecheck Program for the MBTA. This effort produced a full set of bus ridership and schedule adherence data, covering all of the routes within the span of one year. Since January 1999, CTPS has been performing ongoing monitoring of MBTA bus service, including ridechecks and pointchecks. However, even with the installation of automated data collection devices, the MBTA still needs to use manual data collection.

Beginning in late 2007, the MBTA began using automatic passenger counters (APCs) on some of its buses. These devices provide the MBTA with information on the number of boardings and alightings at each stop. However, only about 17 percent of buses in the MBTA's fleet are currently APC-equipped, and the percentage of APC-equipped buses at individual garages is sometimes less than that. Although the need for manual data collection has decreased since the introduction of APCs, it can take several months to collect enough data using APCs to review peak-period crowding conditions because of the limited number of APC-equipped buses. Therefore, pointchecks continue to be a valuable method for quickly collecting data on multiple routes during peak periods.

The MBTA also completed the installation of an automated-fare-collection (AFC) system in 2007. While this system can be used to determine daily counts of boardings at rapid transit stations, manual counts are still required at key transfer stations in order to determine the distribution by mode (heavy rail, light rail, and bus rapid transit). Additional manual counts may also be required to determine boardings by direction.

During the past 20 years, CTPS has also provided the MBTA Service Planning Department with analytical assistance for interpreting the ridership and schedule adherence data. In particular, raw data are examined immediately after being collected to determine whether there are any acute problems in the field. CTPS staff regularly recommend adjustments to the scheduled frequency and running times to address identified problems.

Objectives

1. To perform various forms of data collection on MBTA bus routes, primarily the following tasks:

Pointchecks

Pointchecks, which are peak-load checks, may be conducted to monitor ridership on selected routes.

Ridechecks

Using the same methods employed in previous rounds of the Bus Service Data Collection program, data on ridership at each stop and on running times will be collected on selected routes or trips as requested by the MBTA.

2. To provide analytical assistance to the MBTA with identifying crowding or schedule adherence problems on bus, trackless trolley, and rapid transit routes, and to recommend changes in the scheduled frequency and running times to address those problems.
3. To conduct annual manual counts at one or more rapid transit stations where multiple modes serve one facility, or at stations where boarding information by direction is required.

Work Description

Task 1 Collect Data

CTPS staff will carry out data collection assignments as directed by MBTA staff. The primary data collection activity will be pointchecks conducted at or near the peak-load point along a bus or rail route, or for a group of routes that have a common stop. Pointchecks are usually conducted at 80–100 locations in the fall and again in the spring. Pointcheck data include the vehicle number, direction, and time at each location, and the number of passengers on board.

As a supplement to data collected automatically by the MBTA, CTPS, if requested by MBTA staff, will also collect ridecheck data. This would include boardings and alightings by stop, farebox readings, vehicle trip times, departure and arrival times, and intermediate times.

CTPS staff will also be available, as requested by MBTA staff, to conduct manual rapid transit or light rail station counts as a supplement to data collected automatically. Station counts require having personnel at all entry locations in order to count all of the passengers entering the system, and sometimes require counts at stairwells, escalators, and elevators within a station to determine which modes passengers are using and the direction in which they are traveling.

Product of Task 1

Ridership and schedule adherence data in digital or paper form

Task 2 Process and Analyze Data

CTPS staff will summarize the pointcheck data—after they have been transferred to spreadsheets—in order to provide peak-load summaries, and will examine those data, as well as data collected automatically by the MBTA, to identify problems with vehicle loads or schedule adherence on a route-by-route basis. CTPS staff will then review existing schedules to develop plans for appropriate corrective actions. These actions may include assigning additional vehicles to a route, lengthening or reducing segment-level running times, implementing short-turn services, and other modifications. CTPS staff will also provide the MBTA with the projected hours-of-service costs of implementing any recommended corrective actions.

CTPS staff will participate in the quarterly process of the MBTA Service Committee and will suggest possible modifications, additions, or reductions to MBTA service based on an analysis of pointcheck and station count data collected by CTPS staff, as well as data collected automatically by the MBTA. If requested, CTPS staff will assist the MBTA in reviewing and updating the data that were automatically collected by the MBTA.

CTPS staff will summarize any requested rapid transit station counts in a database.

Products of Task 2

- Summaries of pointcheck data
- Participation in the MBTA Service Committee's quarterly process
- Database of rapid transit station counts

Task 3 Provide Ongoing Technical Support to the MBTA

CTPS staff will provide ongoing technical assistance to the MBTA, as necessary, to address service planning needs.

Estimated Schedule

It is estimated that this project will be completed 12 quarters (36 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 \$540,000 over three years (\$45,000 for three months in the MBTA's fiscal year (FY) 2016, \$180,000 in FY 2017, \$180,000 in FY 2018, and \$135,000 for nine months in FY 2019. This includes the

cost of 327.8 person-weeks of staff time, overhead at the rate of 98.88 percent, and hardware for data collection. A detailed breakdown of estimated costs is presented in Exhibit 2.

KQ/JB/jb

Exhibit 1
ESTIMATED SCHEDULE
MBTA Bus Service Data Collection IX

Task	Quarter											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Collect Data												
2. Process and Analyze Data												
3. Provide Ongoing Technical Support to the MBTA												

Exhibit 2
ESTIMATED COST
MBTA Bus Service Data Collection IX

Direct Salary and Overhead	\$539,922
-----------------------------------	------------------

Task	Person-Weeks					Direct Salary	Overhead (98.88%)	Total Cost
	M-1	P-5	P-4	Temp	Total			
1. Collect Data	0.0	0.5	12.8	198.5	211.8	\$117,922	\$116,601	\$234,522
2. Process and Analyze Data	0.0	2.5	90.0	2.5	95.0	\$125,251	\$123,848	\$249,099
3. Provide Ongoing Technical Support to the MBTA	0.5	0.5	20.0	0.0	21.0	\$28,309	\$27,992	\$56,300
Total	0.5	3.5	122.8	201.0	327.8	\$271,481	\$268,441	\$539,922

Other Direct Costs	\$78
---------------------------	-------------

Hardware for data collection	\$78
------------------------------	------

TOTAL COST	\$540,000
-------------------	------------------

Funding
 Future MBTA Contract