



## BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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

### *MEMORANDUM*

**DATE** August 20, 2015  
**TO** Boston Region Metropolitan Planning Organization  
**FROM** Karl H. Quackenbush  
CTPS Executive Director  
**RE** Work Program for: Prioritization of Dedicated Bus Lanes

#### 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 Prioritization of Dedicated Bus Lanes presented in this memorandum

#### Project Identification

##### Unified Planning Work Program Classification

Planning Studies

##### CTPS Project Number

11402

##### Client

Massachusetts Department of Transportation, Office of Transportation Planning  
*Project Supervisor:* Scott Hamwey

##### CTPS Project Supervisors

*Principal:* Jonathan Belcher

*Manager:* Annette Demchur

##### Funding

MassDOT §5303 Contract #88429

## 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

The continued growth in demand for MBTA services, coupled with the challenging funding environment for major capital expansion projects, suggests that one of the best approaches to increasing the reach of high-quality transit is through improvements in bus operations. The reallocation of existing roadway infrastructure for exclusive use as busways has been shown to significantly improve travel times for bus passengers.

This study will help MassDOT prioritize which segments of Greater Boston streets might benefit from the installation of dedicated bus lanes.

## Objectives

The principle objectives of this work are to help MassDOT prioritize which segments of Greater Boston streets might benefit from the installation of dedicated bus lanes, and to provide stakeholders with an overview of the benefits and reasonableness of prioritizing bus service in certain roadway segments.

## Work Description

The six tasks in this work program are described below:

### Task 1 Map Daily Bus Ridership by Roadway Segment

Since the installation of a dedicated bus lane involves converting a mixed-traffic or parking lane to an exclusive bus lane, which would reduce the effective roadway capacity, dedicated bus lanes provide the greatest net benefit in areas with high existing and/or potential demand for bus service. CTPS will identify and map roadway segments of the bus network where the total ridership of all routes combined in any segment is at least 3,000 passengers per day. CTPS will incorporate the findings of the analyses to be conducted in a parallel study into the findings of this study. The parallel FFY 2016 MPO-funded project, Identifying Opportunities to Alleviate Bus Delay (project #11400), will examine a broad spectrum of strategies for addressing the various causes of bus delay, including dedicated bus lanes on routes where the delays are caused by roadway congestion.

#### *Product of Task 1*

A map of bus network segments where daily bus ridership is at least 3,000 passengers per day

**Task 2 Map Peak-Period Bus Travel Times for Selected Corridors**

The MBTA will provide vehicle travel time data to CTPS. Using these data, CTPS will calculate the travel times during peak periods for the segments identified in Task 1 and will map them. CTPS will also incorporate the findings of the analyses completed for the parallel MPO-funded project, Identifying Opportunities to Alleviate Bus Delay, into the analyses conducted for this study.

*Product of Task 2*

A map of bus travel times by route segment

**Task 3 Compare Peak-Period Bus Travel Times to Free-Flow Bus Travel Times**

Late-night bus travel times will be used to estimate free-flow bus travel times. CTPS will review the bus travel-time data provided by the MBTA to determine late-night bus travel times for the corridors selected in Task 1 and will compare the estimated free-flow bus travel times to peak-period bus travel times. CTPS will then calculate, using bus travel times, the differential between free-flow and peak-period bus travel times.

*Product of Task 3*

A summary of late-night bus travel times, estimates of free-flow bus travel times, and comparisons of free-flow to peak-period bus travel times for the roadway segments identified in Task 1

**Task 4 Identify Initial Universe of Roadway Segments with the Potential for Installation of Dedicated Bus Lanes**

Based on ridership data and the travel-time differential, CTPS, with input from the MBTA and MassDOT, will propose bus ridership thresholds and travel-time differential thresholds for inclusion in the universe of roadway segments for consideration for the installation of dedicated bus lanes. CTPS will also examine street-view images of all of the segments that would meet the ridership and travel-time criteria to determine whether the geometrics of the segments would allow the roads to be reconfigured to include dedicated bus lanes. Segments that clearly have no room for dedicated bus lanes will be dropped from further consideration, and the reason for excluding them from this study will be documented.

*Product of Task 4*

A list of roadway segments that will be considered for installation of dedicated bus lanes

### **Task 5 Gather Automatic Traffic Recorder (ATR) Data for the Universe of Identified Roadway Segments**

CTPS will estimate the bus rider share of peak-period users of the identified roadway segment. CTPS will work with staff from MassDOT, MBTA, and relevant municipalities to obtain recent Automatic Traffic Recorder (ATR) data on traffic volumes for the identified roadway segments. CTPS will also collect peak-period traffic volume data at a few of the top-priority segments for which these data are not available. To the extent possible, CTPS will use factors to estimate the number of occupants per nontransit vehicle. Where these factors are not available, CTPS will use professional judgement to make assumptions of the number of occupants per nontransit vehicle. CTPS may also attempt to estimate the number of other high-occupancy vehicles (such as Transportation Management Association shuttles, private-carrier vehicles, and school buses) and their passengers, as well as emergency vehicles, when collecting data for those segments.

#### *Product of Task 5*

A summary of daily traffic volumes and peak-period volumes on roadway segments that have been identified as candidates for installation of dedicated bus lanes

### **Task 6 Develop Criteria for Prioritizing Roadway Segments for Installation of Dedicated Bus Lanes**

CTPS will work with MassDOT and the MBTA to develop prioritization criteria to rank bus route segments for the installation of dedicated bus lanes. The criteria may include the expected changes in travel time for transit users and/or nontransit drivers, the potential to improve bus frequency without increasing the number of vehicles required, and/or the potential to improve the person throughput of the segment.

#### *Product of Task 6*

A summary of the criteria that will be used to rank bus route segments for installation of dedicated bus lanes

### **Task 7 Produce Final Document**

CTPS will produce a final document that presents the results of Tasks 1 through 6.

#### *Product of Task 7*

Final document

## Estimated Schedule

It is estimated that this project will be completed 21 weeks 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 \$51,000. This includes the cost of 20.4 person-weeks of staff time, overhead at the rate of 98.88 percent, and travel. A detailed breakdown of estimated costs is presented in Exhibit 2.

KQ/JB/jb



**Exhibit 2**  
**ESTIMATED COST**  
**Prioritization of Dedicated Bus Lanes**

<b>Direct Salary and Overhead</b>								<b>\$50,846</b>
Task	Person-Weeks					Direct Salary	Overhead (98.88%)	Total Cost
	M-1	P-4	P-3	P-2	Total			
1. Map Daily Bus Ridership by Roadway Segment	0.0	1.0	1.0	0.0	2.0	\$2,452	\$2,424	\$4,876
2. Map Peak-Period Bus Travel Times for Selected Corridors	0.0	1.0	1.0	0.0	2.0	\$2,452	\$2,424	\$4,876
3. Compare Peak-Period Bus Travel Times to Free-Flow Bus Travel Times	0.5	1.0	1.0	0.0	2.5	\$3,309	\$3,272	\$6,580
4. Identify Initial Universe of Roadway Segments with the Potential for Installation of Dedicated Bus Lanes	0.0	1.0	1.0	0.0	2.0	\$2,452	\$2,424	\$4,876
5. Gather Automatic Traffic Recorder (ATR) Data for the Universe of Identified Roadway Segments	0.0	1.0	1.0	3.9	5.9	\$6,277	\$6,207	\$12,484
6. Develop Criteria for Prioritizing Roadway Segments for Installation of Dedicated Bus Lanes	0.5	1.0	1.0	0.0	2.5	\$3,309	\$3,272	\$6,580
7. Produce a Final Document	2.0	1.0	0.5	0.0	3.5	\$5,316	\$5,257	\$10,573
Total	3.0	7.0	6.5	3.9	20.4	\$25,566	\$25,280	\$50,846
<b>Other Direct Costs</b>								<b>\$154</b>
Travel								\$154
<b>TOTAL COST</b>								<b>\$51,000</b>

**Funding**  
 MassDOT §5303 Contract #88429