



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 August 16, 2012
TO Boston Region Metropolitan Planning Organization
FROM Karl H. Quackenbush
CTPS Executive Director
RE Work Program for: MBTA Transit Contribution to the Reduction
of Greenhouse Gases

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 Transit Contribution to the Reduction of Greenhouse Gases in the form of the draft dated August 16, 2012.

Project Identification

Unified Planning Work Program Classification

Technical Support/Operations Analysis

CTPS Project Number

14334

Client

Massachusetts Bay Transportation Authority

Project Supervisor: Andrew Brennan

CTPS Project Supervisors

Principal: Scott Peterson

Manager: Sreelatha Allam

Funding

MBTA Revenue Bonds

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

This study is being undertaken as part of the American Public Transportation Association (APTA) Sustainability Commitment, which calls for the MBTA and other member transit agencies around the country to establish systems and take actions that demonstrate the value of transit in achieving broader sustainability objectives and that provide a basis for ensuring continual improvement. The signatories to the Sustainability Commitment are required to quantify and report on a series of key performance indicators annually and to track performance against each metric over time. The commitment aims to give its members credit for efforts they are already making as well as support those who are taking first steps. One of the specific components of the commitment is the mandate that its signatories bring attention to the benefit of transit use in terms of greenhouse gases (GHGs).

This study involves quantifying and reporting on two of APTA's sustainability performance metrics. The more prominent of these two metrics in this study is GHG savings per unlinked passenger-trip and vehicle revenue-mile. The other metric is VMT (vehicle-miles traveled) per capita in area of operation. The study's primary focus will be to estimate the reductions in system-level GHG emissions from the automobile mode that are associated with the provision of each of the individual MBTA transit modes. The gross GHG emissions from transit vehicles in CO₂ equivalents will also be estimated.

Objective

The objective of this study is to perform a travel demand analysis comparing GHG emissions for existing conditions, in which the entire MBTA system is operating, with GHG emissions for (a.) four alternatives in each of which one MBTA mode (bus, subway, commuter rail, or ferry) is eliminated and (b.) a fifth alternative in which all MBTA service is eliminated.

Work Description

Task 1 Produce a Dataset Representing Travel under Existing Conditions

The base-year 2010 MPO regional travel demand model set, developed by CTPS, will be used to produce a dataset representing travel under existing

conditions. This dataset will be used as a baseline for comparing the results of the travel demand analyses for each of the five alternatives.

The base-year model set includes the most current socioeconomic data, congested highway travel times, auto operating costs, central business district (CBD) parking costs, transit fares, transit services, and transit travel times.

Product of Task 1

A dataset consisting of the model results for existing conditions

Task 2 Apply the Model Set to the Alternatives

Four alternatives will consist of the base-year conditions with one MBTA transit mode (rapid transit, commuter rail, buses, or ferries) eliminated. The fifth alternative will also consist of the base-year conditions but will have all of the MBTA modes eliminated. The model set will be applied for each alternative to estimate travel demand.

Products of Task 2

Detailed travel demand results for the alternatives

Task 3 Analyze and Summarize Model Results for the Alternatives

The results obtained from the travel demand model set for the alternatives will be analyzed and summarized in terms of:

- For the automobile mode, in the MBTA service area: gross VMT and PMT (passenger-miles traveled), and VMT and VHT (vehicle-hours traveled) per capita
- For the transit modes, systemwide: VMT and PMT, and linked and unlinked trips

Product of Task 3

A spreadsheet summary of travel forecasts for the alternatives

Task 4 Perform Air Quality Analyses

Automobile emissions of the GHG CO₂ will be estimated for each of the alternatives utilizing factors determined using EPA's MOBILE 6.2 vehicle emissions modeling software. (CO₂ accounts for approximately 94% of all GHG emissions for passenger vehicles. The remaining 5% to 6% of emissions are from methane, nitrous oxide, and fluorinated gases.) Emissions of CO₂ and methane (presented as CO₂ equivalents) from the transit modes will also be estimated.

The results for each alternative will be presented for auto and transit trips at the daily (typical workday) and annual levels. They will indicate what contributions each of the four MBTA transit modes make to the reduction of GHGs.

Product of Task 4

CO₂ emissions and methane emissions (presented in terms of CO₂ equivalents) associated with each of the four alternatives

Task 5 Produce a Technical Memorandum

A technical memorandum documenting the modeling methodology, assumptions, and results will be provided to the client.

Product of Task 5

A technical memorandum documenting the study

Estimated Schedule

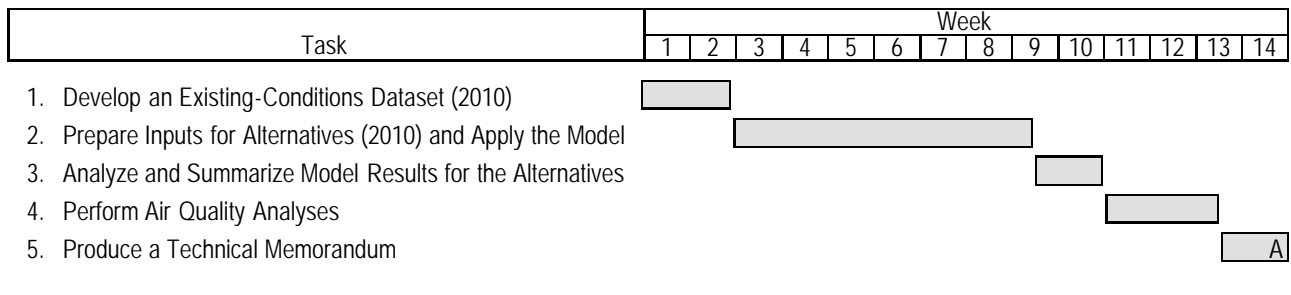
It is estimated that this project will be completed 14 weeks after the notice to proceed is received. The proposed schedule, by task, is shown in Exhibit 1.

Estimated Cost

The total cost of this project is estimated to be \$39,335. This includes the cost of 14.0 person-weeks of staff time and overhead at the rate of 96.58 percent. A detailed breakdown of estimated costs is presented in Exhibit 2.

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Exhibit 1
 ESTIMATED SCHEDULE
 MBTA Transit Contribution to the Reduction of Greenhouse Gases



Products/Milestones

A: Technical Memorandum

Exhibit 2
 ESTIMATED COST
 MBTA Transit Contribution to the Reduction of Greenhouse Gases

Direct Salary and Overhead	\$39,335
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Task	Person-Weeks			Direct Salary	Overhead (@ 96.58%)	Total Cost
	M-1	P-4	Total			
1. Develop an Existing-Conditions Dataset (2010)	0.5	1.5	2.0	\$2,740	\$2,646	\$5,386
2. Prepare Inputs for Alternatives (2010) and Apply the Model	0.5	6.0	6.5	\$8,419	\$8,131	\$16,549
3. Analyze and Summarize Model Results for the Alternatives	0.5	1.5	2.0	\$2,740	\$2,646	\$5,386
4. Perform Air Quality Analyses	0.5	2.5	3.0	\$4,002	\$3,865	\$7,867
5. Produce a Technical Memorandum	0.5	1.0	1.5	\$2,109	\$2,037	\$4,146
Total	2.5	12.5	15.0	\$20,010	\$19,325	\$39,335

Other Direct Costs	\$0
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TOTAL COST	\$39,335
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Funding
 MBTA Revenue Bonds