



## BOSTON METROPOLITAN PLANNING ORGANIZATION

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The Boston Region MPO, the federally designated entity responsible for transportation decision-making for the 101 cities and towns in the MPO region, is composed of the following:

Executive Office of Transportation  
and Public Works  
City of Boston  
City of Newton  
City of Salem  
City of Somerville  
Town of Bedford  
Town of Framingham  
Town of Hopkinton  
Metropolitan Area Planning Council  
Massachusetts Bay Transportation  
Authority Advisory Board  
Massachusetts Bay Transportation  
Authority  
Massachusetts Highway Department  
Massachusetts Port Authority  
Massachusetts Turnpike Authority  
Regional Transportation Advisory  
Council (nonvoting)  
Federal Highway Administration  
(nonvoting)  
Federal Transit Administration  
(nonvoting)

### MEMORANDUM

**DATE** October 18, 2007  
**TO** Transportation Planning and Programming Committee  
of the Boston Region Metropolitan Planning Organization  
**FROM** Arnold J. Soolman, CTPS Director  
**RE** Work Program for: Support to the Green Line Extension  
Environmental Review

#### ACTION REQUIRED

Review and approval

#### PROPOSED MOTION

That the Transportation Planning and Programming Committee of the Boston Region Metropolitan Planning Organization, upon the recommendation of the Executive Office of Transportation and Public Works, vote to approve the work program for Support to the Green Line Extension Environmental Review dated October 18, 2007.

#### PROJECT IDENTIFICATION

**Unified Planning Work Program Classification**  
Planning Studies

**CTPS Project Number**  
22328

**Client**  
Executive Office of Transportation and Public Works (EOTPW)  
*Project Supervisor:* Steve Woelfel

**CTPS Project Supervisors**  
*Principal:* Karl Quackenbush  
*Manager:* Scott Peterson

**Funding**  
To be determined

## 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

It is an EOTPW legal commitment under the State Implementation Plan to extend the Green Line service from a relocated Lechmere Station through Cambridge and Somerville to Medford on the Lowell commuter rail line right-of-way, with a 0.6-mile spur to Union Square partially along the Fitchburg commuter rail line right-of-way.

This project in various forms has been examined by CTPS in conjunction with the MPO's Regional Transportation Plan, the MBTA's Program for Mass Transportation, SIP project analysis, and the Beyond Lechmere Study over the last 15 years. Based on the latest SIP requirements and the state's desire to move this project forward, CTPS was asked to conduct an analysis focused on supporting the preparation of a draft environmental impact report/draft environmental impact statement (DEIR/DEIS). The DEIR/DEIS will address the comments included in the Expanded ENF Certificate that was issued by EOEPA in December 2006. This includes but is not limited to an examination of localized traffic impacts, an environmental justice analysis, and an analysis of mobile emissions, such as volatile organic compounds (VOC), nitrous oxide (NO<sub>x</sub>), greenhouse gases, carbon monoxide (CO), particulate matter (PM), and primary air toxics. The DEIR/DEIS will be an update to the previous alternatives analysis conducted during the Beyond Lechmere Study; CTPS will assist with the re-evaluation of ridership projections, air quality analysis, and user benefits. CTPS will also provide assistance in the development of a New Starts application.

## OBJECTIVE

CTPS will provide support to the client and the client's consultant in the preparation of the DEIR/DEIS by collecting, analyzing, and reporting of various data and performing travel demand modeling tasks. The work will include:

1. Coordinate with the Federal Transit Administration (FTA) to determine the level of updating required in the ridership forecasting component of the DEIR/DEIS.
2. Compile land use and demographic data for the study area for the years of analysis.
3. Assist in the development of modeling scenarios in collaboration with the client and the consultant.
4. Estimate the travel demand for these alternatives using the regional model.
5. Compile and tabulate the model results and assist the client and consultant in the interpretation of them.
6. Assist EOTPW in the coordination and development of the DEIS/DEIR and the New Starts application.

## WORK DESCRIPTION

The following tasks will be performed by CTPS to support completion of the Green Line extension DEIR/DEIS and New Starts application.

### **Task 1 Project Coordination**

This work will involve coordinating with the client and consultant about the current land use data and other modeling assumptions being used in this analysis.

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

Coordination with EOTPW, the consultant, and other key stakeholders.

### **Task 2 Travel Market Analysis**

One of the tasks identified in the consultant's work program involves updating the travel market analysis performed for the Beyond Lechmere Study. CTPS will assist the consultant by providing trip flow data for the Green Line extension corridor. Using the base-year travel model developed for the Regional Transportation Plan and the future-year travel model assumptions, CTPS will prepare a summary of these trip flows, by mode, to and from the major activity centers in the Green Line extension corridor. This analysis will be conducted in coordination with the various stakeholders and the FTA. These data will be summarized for both the base-year and the future-year conditions.

#### ***Product of Task 2***

Summary of trip flow data for the Green Line extension corridor.

### **Task 3 Travel Demand Forecasts**

CTPS will refine, code, apply, analyze, and report the results of the travel demand forecasting process for up to 22 model runs spanning the base year (2006), opening year (2015), and horizon year (2030) of analysis.

#### **Sub-task 3.1 Refine Calibration**

In order to utilize the latest planning data available to this study, the model set and its inputs will be refined in order to maximize their sensitivity to the current transportation utilization in the study area. This will involve looking in detail at boarding-level data by mode and at roadway traffic counts and patterns, as well as examining the demographic assumptions about the study area. The calibration process includes the highway and transit systems, and the results of this will be applied to the forecast years.

#### ***Product of Sub-task 3.1***

Refined and calibrated model set.

**Sub-task 3.2 Build Future-Year Inputs**

Working with the client and the consultant, CTPS will review and update the inputs for analyzing the future-year alternatives. This includes coding of the highway and transit network to best reflect the alternative being analyzed, with its respective operating assumptions for the year in question. Other future-year model inputs may be refined to reflect the needs of this study. The future years consist of the opening year and the horizon year, 2030.

***Products of Sub-task 3.2***

Updated transportation coding and inputs into the modeling process for future years.

**Sub-task 3.3 Application of the Travel Demand Model**

For each no-build, baseline, and build alternative coded in Sub-task 3.2, CTPS will run the CTPS travel model and produce future-year ridership forecasts. CTPS will also produce highway demand, air quality, and user benefit forecasts. The output of the model runs will be summarized in sufficient detail as needed.

***Products of Sub-task 3.3***

Model runs for each no-build, baseline, and build alternative.

**Task 4 Summaries and Interpretation of the Travel Demand Model Results**

For each no-build and build alternative modeled in Sub-task 3.3, CTPS will analyze and interpret the results of the future-year ridership forecasts. The results will be summarized in tabular form.

***Products of Task 4***

- Summary of systemwide ridership statistics.
- Summary of detailed boardings by transit submode and at selected stations.
- Summary of daily, peak period, and peak hour directional link volumes on the rapid transit and Green Line extension services.
- Summary of user benefits for all alternatives.
- Summary of operating characteristics.
- Summary of regional VMT, VHT, and average speed on the highway system.
- Summary of projected traffic volumes on key links.
- Summary of any selected link analysis, if needed.
- Summary of an air quality analysis consisting of VOC, NO<sub>x</sub>, CO as a surrogate for greenhouse gases, and PM.
- Summary of an environmental justice equity analysis as it relates to mobility and accessibility.

**Task 5 Assistance with Development of a New Starts Submission**

CTPS will provide support to and coordinate with EOTPW and its consultant in data collection, data analysis, developing forecasts of ridership, air quality analysis, forecasting user benefits, and other aspects of developing and supporting a New Starts application.

***Products of Task 5***

Summary and interpretation of data, model results, emissions estimates, and user benefit forecasts for inclusion in a New Starts application.

**Task 6 Technical Memorandum**

CTPS will produce a technical memorandum documenting and interpreting the results of the ridership, air quality, and traffic analyses. All the model results specified in this work program will be summarized and explained for all the alternatives. The major assumptions embedded in the models and in the post-assignment procedures will be summarized as well.

***Product of Task 6***

A technical memorandum on the modeling methodology used and the results produced in Tasks 2, 3, 4, and 5.

**ESTIMATED SCHEDULE**

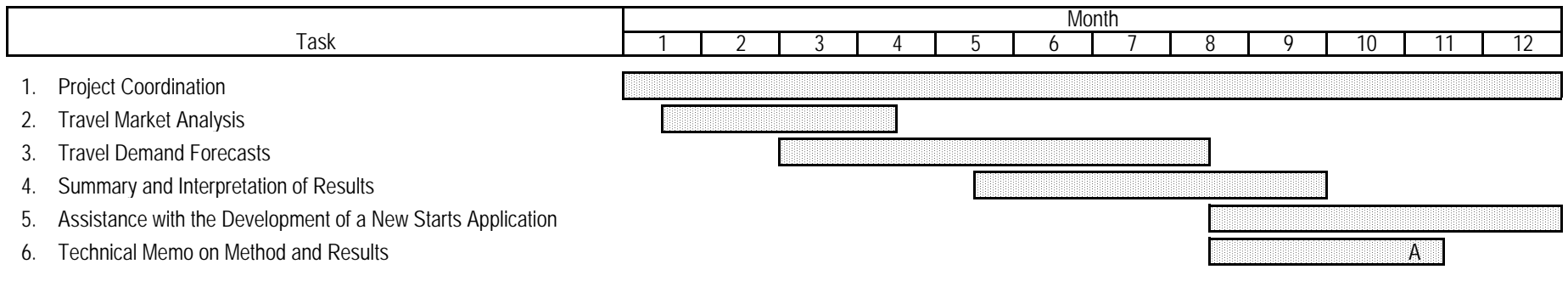
It is estimated that this project would be completed 12 months after the notice to proceed is received. The proposed schedule, by task, is shown in Exhibit 1.

**ESTIMATED COST**

The total cost of this project is estimated to be \$100,000. This includes the cost of 38.8 person-weeks of staff time, overhead at the rate of 84.98 percent and travel. A detailed breakdown of estimated costs is presented in Exhibit 2.

AJS/SAP/sap

Exhibit 1  
 ESTIMATED SCHEDULE  
 Support to the Green Line Extension Environmental Review



Products/Milestones

A: Technical Memorandum on Method and Results

Exhibit 2  
**ESTIMATED COST**  
**Support to the Green Line Extension Environmental Review**

**Direct Salary and Overhead** **\$99,950**

Task	Person-Weeks					Direct Salary	Overhead (@ 84.98%)	Total Cost
	M-1	P-5	P-4	P-3	Total			
1. Project Coordination	0.9	2.5	1.0	0.2	4.6	\$6,689	\$5,684	\$12,373
2. Travel Market Analysis	0.6	2.4	1.9	1.0	5.9	\$7,899	\$6,713	\$14,612
3. Travel Demand Forecasts	1.6	8.3	4.3	2.1	16.3	\$22,553	\$19,165	\$41,718
4. Summary and Interpretation of Results	1.5	2.0	2.2	1.1	6.8	\$9,193	\$7,812	\$17,005
5. Assistance with the Development of a New Starts Application	1.1	1.4	0.6	0.0	3.1	\$4,642	\$3,945	\$8,587
6. Technical Memo on Method and Results	0.5	1.0	0.6	0.0	2.1	\$3,057	\$2,598	\$5,655
Total	6.2	17.6	10.6	4.4	38.8	\$54,033	\$45,917	\$99,950

**Other Direct Costs** **\$50**

Travel \$50

**TOTAL COST** **\$100,000**

*Funding*  
*To be determined*