



## BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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

### *MEMORANDUM*

**DATE** January 22, 2015  
**TO** Boston Region Metropolitan Planning Organization  
**FROM** Karl H. Quackenbush  
CTPS Executive Director  
**RE** Work Program for: Kendall Square Mobility Task Force

#### 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 the Kendall Square Mobility Task Force presented in this memorandum

#### Project Identification

##### Unified Planning Work Program Classification

Planning Studies

##### CTPS Project Number

12345

##### Client

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

##### CTPS Project Supervisors

*Principal:* Scott Peterson  
*Manager:* Bruce Kaplan

##### Funding

MassDOT SPR Contract #81334

## 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

Cambridge's Kendall Square has been transformed in the past few decades from an industrial zone to an internationally renowned biotech and high-tech center. Rapid growth has occurred since the turn of the 21st century, as 4.6 million square feet of commercial and institutional space has been developed in and around Kendall Square. Substantial future development and redevelopment are planned for this area, including:

- 280,000 square feet of mixed-use development in the Cambridge Center Mixed-Use Development District
- Redevelopment of the US Department of Transportation's Volpe Center
- MIT developments that are located along Main Street and Broad Canal Walk, and developments that link the Charles River area to Kendall Square

The massive change associated with such development presents a challenge of creating a balanced and integrated multimodal transportation system capable of serving the district for its long-term success. In 2013, the Cambridge Community Development Department published a report of their Kendall Square study, in which they had begun to compile a summary of transportation issues. There is a need for a more focused transportation plan given the realities of the current situation and future forecasts of major development. MassDOT has formed a project team; CTPS will be working in conjunction with the team. CTPS has been asked to provide technical assistance in this planning endeavor.

## Objectives

The principal objectives of this work program are:

1. To develop a future land-use build-out scenario for the Kendall Square area
2. To provide modeling support to the project team to examine the existing roadway and transit conditions and future-year forecasts

## Work Description

The seven tasks in this work program are described below:

### Task 1 Perform Base-Year Model Calibration for the Study Area

This task consists of refining and enhancing the Boston Region MPO's regional travel demand model set for the Kendall Square area. Specific attention will be paid to replicating existing conditions on the study area's transit and roadway networks, for which CTPS will compile available study-area transit and roadway counts. The results of running the base-year model will be summarized in sufficient detail to provide systemwide statistics and study-area-specific data, such as daily boardings, alightings, and access-mode shares at major rapid transit stations and boardings on groups of bus lines during the AM peak period (6:00 to 9:00 AM) and the PM peak period (3:00 to 6:00 PM).

#### *Product of Task 1*

An updated calibrated multimodal travel demand model set for the study area

### Task 2 Model the 2040 No-Build Scenario

CTPS will develop the 2040 no-build scenario for this study following consultation with the City of Cambridge and the Metropolitan Area Planning Council (MAPC). The no-build scenario will be based on the most recent demographic assumptions and multimodal transportation networks in the Boston Region MPO's Long-Range Transportation Plan. A trip table for the year 2040 will be developed from these elements, following the running of the regional travel demand model set's trip generation and trip distribution model routines. The mode choice and assignment components of the model set will be used to prepare the same categories of estimated traffic and transit volumes for this scenario that were generated in Task 1 for the base year so that the base-year and no-build scenarios can be compared.

#### *Products of Task 2*

- 2040 No-Build Scenario
- Graphic and tabular summaries of relevant roadway and transit data, including analyses of volume-to-capacity ratios and peak loads

### Task 3 Develop and Model 2040 Build-Out Scenario and Quantify Its Impact on the Transportation System

CTPS will meet with the project task force and other project stakeholders to develop a "build-out" 2040 scenario for the Kendall Square area that will assume the maximum proposed development. The regional travel demand model set will be used to prepare the same categories of estimated traffic and transit volumes from this build-out scenario as were generated in Task 2. CTPS will summarize and compare these results to those of the base-year and 2040 no-build model runs. The results will include roadway and transit volumes in the study area, systemwide person and vehicle trips by mode by time of day, and transit boardings at selected stations and on selected bus lines.

*Products of Task 3*

- 2040 Build-Out Scenario
- Graphic and tabular summaries of relevant roadway and transit data, including analyses of volume-to-capacity ratios and peak loads

**Task 4 Model Build Scenarios and Analyze Results**

Based on input from the project team, CTPS will model up to three transit build scenarios based on the full-build scenario and will summarize the results in the same fashion as in Task 3.

*Products of Task 4*

- Transit build scenarios
- Graphic and tabular summaries of relevant roadway and transit data, including analyses of volume-to-capacity ratios and peak loads

**Task 5 Perform Air Quality and Environmental-Justice Analyses**

CTPS will work in coordination with the project team on air quality analyses. The air quality analyses, building on the model outputs from Tasks 2–4, will estimate mobile emissions from cars, trucks, and transit vehicles of carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), and particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>).

CTPS will conduct environmental-justice analyses for the proposed scenarios. After identifying communities of concern, specified performance measures—accessibility to health care, higher education, and jobs; mobility and congestion; and environmental impacts—will be used as indicators of benefits and burdens for environmental-justice and non-environmental-justice communities.

*Products of Task 5*

- Tabular summaries of emissions for the air quality studies
- Tabular summaries of the results of the environmental-justice analyses

**Task 6 Coordinate with Project Team and Provide Ongoing Technical Assistance**

CTPS will work with the project team throughout the study, with an anticipated time frame for modeling of approximately one year. In the event of project delays beyond the control of CTPS, the timing of project deliverables will be consistent with revised schedules set by the project team. CTPS staff time and budget estimates reflect attendance at a maximum of four task force meetings, two public meetings, and five project team meetings. CTPS will fulfill any data requests from the project team for which the data are readily available.

*Product of Task 6*

Coordination with the project team, attendance at meetings, and other assistance as needed

**Task 7 Prepare a Final Memorandum or Report**

CTPS staff will produce a final memorandum or report that will summarize the findings of the project.

*Product of Task 7*

Memorandum or report

**Estimated Schedule**

It is estimated that this project will be completed 12 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 \$80,611. This includes the cost of 32.5 person-weeks of staff time and overhead at the rate of 91.82 percent. A detailed breakdown of estimated costs is presented in Exhibit 2.

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**Exhibit 2**  
**ESTIMATED COST**  
**Kendall Square Mobility Task Force**

| <b>Direct Salary and Overhead</b>   |              |     |      |       |               |                   |            | <b>\$80,611</b> |
|---|--------------|-----|------|-------|---------------|-------------------|------------|-----------------|
| Task  | Person-Weeks |     |      |       | Direct Salary | Overhead (91.82%) | Total Cost |                 |
|   | M-1          | P-5 | P-3  | Total |               |                   |            |                 |
| 1. Perform Base-Year Model Calibration for the Study Area   | 0.5          | 1.0 | 3.0  | 4.5   | \$5,939       | \$5,454           | \$11,393   |                 |
| 2. Model 2040 No-Build Scenario   | 0.0          | 0.0 | 2.0  | 2.0   | \$2,204       | \$2,024           | \$4,227    |                 |
| 3. Develop and Model 2040 Build-Out Scenario and Quantify Its Impact on the Transportation System | 1.0          | 1.0 | 3.0  | 5.0   | \$6,817       | \$6,260           | \$13,077   |                 |
| 4. Model Build Scenarios and Analyze Results  | 0.5          | 0.0 | 6.0  | 6.5   | \$7,489       | \$6,877           | \$14,366   |                 |
| 5. Perform Air Quality and Environmental-Justice Analyses   | 0.0          | 0.0 | 2.0  | 2.0   | \$2,204       | \$2,024           | \$4,227    |                 |
| 6. Coordinate with Project Team and Provide Ongoing Technical Assistance                          | 1.5          | 0.0 | 3.0  | 4.5   | \$5,939       | \$5,454           | \$11,393   |                 |
| 7. Prepare a Final Memorandum or Report   | 3.0          | 1.0 | 4.0  | 8.0   | \$11,431      | \$10,496          | \$21,927   |                 |
| Total   | 6.5          | 3.0 | 23.0 | 32.5  | \$42,024      | \$38,586          | \$80,611   |                 |
| <b>Other Direct Costs</b>   |              |     |      |       |               |                   |            | <b>\$0</b>      |
| <b>TOTAL COST</b>   |              |     |      |       |               |                   |            | <b>\$80,611</b> |

**Funding**  
 MassDOT SPR Contract #81334