MEMORANDUM

DATE **August 7, 2014**

TO **Boston Region Metropolitan Planning Organization**

FROM **Karl H. Quackenbush**
CTPS Executive Director

RE **Work Program for: McGrath Boulevard Area Traffic Analysis: Modeling Support**

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 McGrath Boulevard Area Traffic Analysis: Modeling Support, presented in this memorandum

Project Identification

Unified Planning Work Program Classification

Planning Studies

CTPS Project Number

22208

Client

Massachusetts Department of Transportation, Highway Division
Project Supervisor: Michael Trepanier

CTPS Project Supervisors

Principal: Scott Peterson
Manager: Bruce Kaplan

Funding

MassDOT Contract #TBD

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

East Somerville and other areas adjacent to or near Route 28 are the locations of a great deal of existing and future residential, commercial, and industrial development that is important to overall development in the Boston metropolitan region. Accessibility to and within this corridor, and accessibility to surrounding areas from this corridor, including access to open space and connections to the Boston core, is very important for the corridor's development and for the quality of life of its residents.

Route 28 is a heavily traveled roadway, which is why it is classified as an "other freeway," a higher classification than "urban principal arterial." It provides regional mobility and land access to neighborhoods adjacent to the roadway. Most of Route 28 in Somerville is congested during peak hours, and motorists experience low speeds and delays.

Concerns about corridor accessibility led to a recent MassDOT study carried out under the guidance of the Route 28 Corridor Advisory Committee. One result of this extensive study and additional research was a decision to redesign Route 28 as a "boulevard" type of roadway similar to the segment of Massachusetts Avenue between Harvard Square and Porter Square in Cambridge. The design currently includes a median with green landscaping, street furniture, and wide sidewalks for pedestrians.

As the design has proceeded, it has become apparent that there are two major issues regarding traffic capacity and traffic patterns that would require further analysis: 1) whether a four-lane boulevard would provide suitable traffic capacity or whether a six-lane boulevard would be required; and 2) how the diversion of traffic from the new boulevard segment of Route 28 would affect traffic levels on nearby roadways, especially on Rutherford Avenue, whether Rutherford Avenue were to retain present configuration or be a redesigned boulevard. It is hoped that this study will begin to answer these questions.

Objectives

The objectives of this study are to prepare estimates of the changes in local and regional travel patterns that would occur as a result of each of four potential future scenarios and to analyze the consequent impacts on air quality and environmental justice in and around the project area.

Work Description

Work on this study will consist of the following six tasks: calibrating an updated base-year regional travel demand model, creating a microsimulation model of the project area, modeling a future-year no-build scenario, modeling future-year build scenarios, documenting the results of the study in a memorandum, and providing ongoing modeling assistance.

Task 1 Calibrate an Updated Base-year Model

CTPS will take the most up-to-date TransCAD version of the base-year (2010) Boston Region MPO regional travel demand model and calibrate it to the available data on traffic patterns in the project area (including the latest set of roadway volume counts).

Products of Task 1

- Regional model network with accurate representation of the McGrath Boulevard corridor
- Tabular summary comparing estimated AM peak, PM peak, and average weekday vehicle volumes with available roadway volume counts for the McGrath Boulevard corridor
- Tabular summary comparing estimated AM peak, PM peak, and average weekday transit ridership volumes with available transit ridership counts for transit services in the McGrath Boulevard corridor

Task 2 Create a Microsimulation Model of the Project Area

While the regional model that was used to create the base-year model in Task 1 could be used to estimate regional changes, as well as many local changes, in travel patterns resulting from changes in the transportation infrastructure and transit services, it is not capable of estimating changes at the detailed traffic engineering level. In order to make that possible, CTPS will create a microsimulation model of the project area using TransModeler software, building on the model calibrated in Task 1. In order to complete this task, CTPS will obtain data on the transportation infrastructure (such as traffic signal locations and timing) from the consultant and will add several local roads to the network.

Product of Task 2

- Microsimulation model of the McGrath Boulevard project area in the base year with accurate representation of the infrastructure and services

Task 3 Model a Future-Year No-Build Scenario

CTPS will model a future-year version of the Boston Region MPO's regional travel demand model, using the latest available demographic forecasts for 2035 and transportation networks that will include all of the projects that would be in place by 2035 under the Boston Region MPO's current adopted Long-Range

Transportation Plan (including the Green Line Extension to Union Square and Medford). CTPS will also update the microsimulation model of the McGrath Boulevard area to reflect network changes and estimated changes in travel volumes.

Products of Task 3

- Tabular summaries of estimates of traffic growth from the base year to the future year in AM peak, PM peak, and average weekday roadway vehicle and transit ridership volumes in the McGrath Boulevard area
- Microsimulation model of the McGrath Boulevard project area in the future year, tabular summaries of changes in turning-movement volumes and intersection queues and delays, and an animated depiction of the changes in project-area travel patterns brought about by changes between the base-year and future-year no-build scenarios

Task 4 Model Future-Year Build Scenarios

CTPS will apply the future-year regional travel demand model and microsimulation model (both prepared in Task 3) to up to four build scenarios. Each scenario will incorporate the proposed modifications to the roadways and services into the transportation network.

The scenarios will analyze the impacts on travel patterns, vehicular emissions, and environmental justice metrics of the construction of a four-lane McGrath Boulevard or a six-lane McGrath Boulevard, which would replace the present McGrath Highway, and the replacement of the present Rutherford Avenue infrastructure with a boulevard. The microsimulation model will be used to analyze the impacts of traffic engineering changes and will estimate the changes in travel patterns at a more detailed level.

Products of Task 4

- Tabular summaries of changes in roadway traffic and transit ridership volumes from the future-year no-build scenario to each future-year build scenario in AM peak, PM peak, and average weekday volumes in the McGrath Boulevard area
- Tabular summaries of changes in vehicular emissions and environmental justice metrics resulting from changes in the McGrath Boulevard area from the future-year no-build scenario to each future-year no-build scenario
- Tabular summaries of turning-movement volumes and intersection queues and delays for each scenario.
- An animated depiction of the changes in travel patterns in the project area brought about by each of the four build scenarios.

Task 5 Produce a Technical Memorandum

CTPS will prepare a technical memorandum that will describe the models and techniques used in carrying out the analysis during this study and the results of the analysis

Product of Task 5

Technical memorandum documenting the analytical procedures used in this study and the results of the analysis

Task 6 Provide Additional Technical Assistance

CTPS will provide up to five person-weeks of additional support to the modeling efforts performed for the McGrath Boulevard project. This work could include attending MassDOT project team meetings and public meetings.

Product of Task 6

Tabular or graphical summaries of the results of additional analysis performed as part of this task

Estimated Schedule

It is estimated that this project will be completed 4.5 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 $127,954. This includes the cost of 42.0 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.

KQ/IEH/ieh

Exhibit 1
ESTIMATED SCHEDULE
McGrath Boulevard Area Traffic Analysis: Modeling Support

Task	Month 1	2	3	4	5
1. Calibrate an Updated Base-Year Model					
2. Create a Microsimulation Model of the Project Area					
3. Model a Future-Year No-Build Scenario					
4. Model Future-Year Build Scenarios			A B	C D	E
5. Produce a Technical Memorandum					F
6. Provide Additional Technical Assistance					

Products/Milestones

- A: Results of first build scenario
- B: Results of second build scenario
- C: Results of third build scenario
- D: Results of fourth build scenario
- E: Results of environmental justice analysis
- F: Technical memorandum

Exhibit 2
ESTIMATED COST
McGrath Boulevard Area Traffic Analysis: Modeling Support

Direct Salary and Overhead	**$127,954**

Task	Person-Weeks					Direct Salary	Overhead (91.82%)	Total Cost
	M-1	P-5	P-4	P-3	Total			
1. Calibrate an Updated Base-Year Model	0.0	4.5	0.0	2.0	6.5	$10,105	$9,278	$19,383
2. Create a Microsimulation Model of the Project Area	0.0	3.5	0.0	2.0	5.5	$8,349	$7,666	$16,015
3. Model a Future-Year No-Build Scenario	0.5	3.0	0.0	1.0	4.5	$7,247	$6,654	$13,901
4. Model Future-Year Build Scenarios	1.0	12.0	0.0	4.0	17.0	$27,169	$24,946	$52,115
5. Produce a Technical Memorandum	1.5	1.0	1.0	0.0	3.5	$5,711	$5,243	$10,954
6. Provide Additional Technical Assistance	0.5	3.5	0.0	1.0	5.0	$8,125	$7,460	$15,585
Total	3.5	27.5	1.0	10.0	42.0	$66,705	$61,249	$127,954

Other Direct Costs	**$0**

TOTAL COST	**$127,954**

Funding

MassDOT Contract #TBD