BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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

# *MEMORANDUM*

**DATE** October 19, 2017
**TO** Boston Region Metropolitan Planning Organization
**FROM** Karl H. Quackenbush, Executive Director
**RE** Work Program for Addressing Safety, Mobility, and Access on Subregional Priority Roadways FFY 2018

## Action Required

Review and approval

## Proposed Motion

That the Boston Region Metropolitan Planning Organization (MPO) votes to approve the work program for Addressing Safety, Mobility, and Access on Subregional Priority Roadways Federal Fiscal Year (FFY) 2018, presented in this memorandum

## Project Identification

### Unified Planning Work Program Classification

Planning Studies and Technical Analysis

### CTPS Project Number

13286

### Client

Boston Region MPO

### CTPS Project Supervisors

*Principal:* Mark Abbott
*Manager:* Chen-Yuan Wang

### Funding

MPO Planning Contract #101725
MPO §5303 Contract #98873 and subsequent MPO §5303 contract

## Impact on MPO Work

This is MPO work and will be carried out in conformance with the priorities established by the MPO.

## Background

During outreach for the development of the Boston Region MPO's Unified Planning Work Program (UPWP) and Long-Range Transportation Plan (LRTP), Metropolitan Area Planning Council (MAPC) subregional groups and other entities submit comments and identify transportation problems and issues that concern them. Often these issues are related to roadway bottlenecks, safety, or lack of safe or convenient access to abutters along roadway corridors. Such issues can affect not only mobility and safety along a roadway and its side streets, but also livability, quality of life, economic development, and air quality.

To address these kinds of issues, the MPO staff implements the *Addressing Safety, Mobility, and Access on Subregional Priority Roadways* study each year to identify and study roadway corridor segments in the MPO region that are of concern, but that have not been identified in the LRTP regional needs assessment.[1] The roadways selected for study are not major arterials, but rather arterial or collector roadways that carry fewer vehicles daily than major arterials. The studies emphasize the issues that are identified by relevant subregional groups and develop recommendations for short- and long-term improvements. In addition to safety, mobility, and access, other subjects that are considered are transit feasibility, truck-related issues, and bicycle and pedestrian transportation.

Roadway corridor segments are selected for study based on criteria that are used to evaluate safety and mobility needs; agency, municipal, and MAPC subregional group input; and the feasibility of implementing study recommendations. A segment selected for study may span multiple municipalities, or it may be restricted to a few intersections in a town center, shopping area, or office park.

- A roadway corridor study is a logical way to address subregional multimodal transportation needs, since it evaluates a roadway corridor segment comprehensively; pedestrians, bicyclists, motorists, public transportation users, and abutters are all considered. A holistic approach is taken to analyze the issues and develop recommendations for improvements within the roadway's right-of-way. The recommendations are intended to improve transportation facilities and traffic operations, and to increase safety and quality of life for all users. Pedestrians and bicyclists should be able to cross the street safely on their way to shops, schools, or recreation; buses should be

[1] *Charting Progress to 2040, the Long-Range Transportation Plan of the Boston Region Metropolitan Planning Organization,* July 30, 2015.

able to run on schedule; and transit riders should be assured safe access to and from transit stations.

## Objectives

The objectives of this study are as follows:

- Select an arterial or collector roadway segment based on prioritization criteria and input from agencies, municipalities, and MAPC subregional groups
- Identify safety, mobility, access, and other transportation-related problems within the roadway segment
- Evaluate the feasibility of multimodal transportation solutions addressing the pedestrian, bicycle, truck, and transit modes

## Work Description

The MPO staff will perform the following tasks:

- Elicit input from agencies, municipalities, and MAPC subregional groups
- Select a roadway segment for study
- Collect data
- Analyze data
- Recommend improvements
- Document methodology, findings, and recommendations

### Task 1 Elicit Agency, Municipal, and MAPC Subregion Input

The MPO staff will review existing public comments gathered during the development of the LRTP and UPWP and from other outreach activities, and begin constructing an initial list of roadway segments to consider. Subsequently, staff will invite municipal officials and members of the MAPC subregional groups in the potential study areas, and representatives from the Massachusetts Department of Transportation (MassDOT) Office of Transportation Planning and Highway Division, the MBTA, and regional transit authorities (if the segment is in the service area of MetroWest or Cape Ann) to comment on the candidate roadway segments. Participants will provide advice and input regarding data, the selection of roadway segments for study, and the identification of transportation-related problems associated with those roadways. The recommendations from this study will be implemented by the MassDOT Highway Division or municipalities; therefore, it is important that the study recommendations reflect their experience and design standards.

#### *Products of Task 1*

- Documentation of input received from participants, including their advice regarding data and the selection of roadway segments for study
- Identification of transportation-related problems and possible solutions

### Task 2 Select Roadway Segment for Study

The MPO staff will develop a ranking system, similar to what they used for the *Addressing Safety, Mobility, and Access on Subregional Priority Roadways: FFY 2017* study, and apply it to the candidate roadway segments in order to select a segment for study. The ranking system will use metrics for the following criteria:

- Safety conditions
- Multimodal significance
- Subregional priority
- Implementation potential
- Regional equity (so that over time locations will be studied throughout the MPO's planning area)

The proposed selection, along with the list of candidate segments, will be presented to the MPO for discussion and approval.

Then, the MPO staff—working in conjunction with agencies, municipalities, and subregional groups—will identify the problem locations within each roadway segment selected for study. For each segment, staff will examine the safety, mobility, and access problems facing pedestrians, bicyclists, motorists, and transit users, as well as any transit service deficiencies and connectivity problems. Staff also will identify truck traffic issues indicated by crash locations with an unusually high level of truck involvement, turning-radius issues at intersections, heavy truck volumes contributing to congestion along the corridor, and points where trucks conflict with cars and pedestrians.

In addition, to identify projects and studies planned or already implemented in the study areas, staff will review the MassDOT Highway Division's databases and the MPO's Transportation Improvement Program (TIP) project information database, and contact the municipalities in the study areas. The information gathered from these sources will not only guide the selection of problem locations within each segment, but will enable staff to consider previous recommendations for incorporation into this study.

#### *Products of Task 2*

Documentation of the following:

- Safety, operational, and mobility problems facing pedestrians, bicyclists, motorists, and transit users
- Transit service issues, including service deficiencies and problems with connectivity
- Truck traffic issues
- Projects and studies already planned or conducted that address the roadway segments in this study

- The process for selecting the roadway segment (presented in a technical memorandum)

### Task 3 Collect Data

Once the problem locations have been identified on the roadway segment selected for this study, corresponding recent and historical data will be gathered from existing sources, including studies performed by municipalities or proponents of private development projects, and databases maintained by the MPO and MassDOT Highway Division. Some data may be collected in the field, such as the following:

- Turning movement counts for trucks, pedestrians, and bicyclists in the AM and PM peak periods
- Average annual weekday traffic data from automatic traffic recorder counts
- Traffic signal timing plans and coordination settings
- Lane configurations
- Bus service performance data and locations of bus stops, signage, and shelters
- Truck traffic data, including truck origins and destinations
- Right-of-way measurements
- Condition of pavement, sidewalks, and midblock crossings
- Mitigation proposals for development projects and proposed transportation projects, and specific proposed improvements for the chosen roadway segment from these sources
- Crash statistics, rates, and diagrams for locations with crash rates exceeding the MassDOT Highway Division's district average, based on the most recent five-year data
- Signage and street markings
- Video recordings of traffic operations and geometrics along corridor

***Products of Task 3***

- Data sets for assessing safety, mobility, access, and operational performance at problem locations
- A list of economic development and transportation improvement proposals previously planned for the areas near the selected roadway segment

### Task 4 Analyze Data

The MPO staff will perform a series of analyses, similar to those conducted for past studies, to use in developing recommendations for ways to provide Complete Streets—where pedestrians, bicyclists, motorists, and transit riders of all ages and abilities are able to travel safely. The following analyses and evaluations will be performed:

- Analysis of crash data and preparation of crash diagrams to identify safety issues and possible safety improvements
- Analysis of crash, traffic-volume, and intersection turning-radius data to develop potential safety improvements related to truck traffic
- Evaluation of sidewalk continuity to determine the need to install new sidewalks or replace damaged sidewalks
- Evaluation of pedestrian crosswalks to determine the need for new midblock crosswalks or the need to improve existing crosswalks by installing flashing beacons, improving signage, or making the crosswalks accessible to people with disabilities
- Development of safe and economical means for accommodating bicyclists, for example, by adding bicycle lanes, providing adequate shoulders, or making other provisions so that bicyclists can share the road with motorists
- Analyses of traffic signal warrants and signal retiming and coordination plans to determine the appropriate intersection traffic controls and best signal timing plans for the safe and efficient movement of pedestrians, bicyclists, and motorists
- Assessment of traffic signal equipment to determine the need for upgrades, including upgrades to signalized intersections for compliance with the requirements of the Americans with Disabilities Act
- Evaluation of the on-time performance of bus service, bus stop placement in relation to demand and pedestrian activity, and the need for bus route signs and shelters

***Product of Task 4***

Documentation of the results of Task 4 analyses, including crash analysis tables, intersection crash diagrams, delay-and-queue calculations, warrant analyses, bus performance statistics, maps, and other graphics showing pedestrian and bicyclist needs

### Task 5 Recommend Improvements

Based on the analyses described above, staff will develop short- and long-term improvement strategies that would address the following issues: pedestrian, bicyclist, and motorist safety; accommodation of pedestrians, bicyclists, and transit users; other traffic operations issues, including those related to trucks; and bus service issues.

Specific improvements may relate to the following: geometric configuration; traffic control devices; pavement rehabilitation; and traffic operations, including effective and safe accommodations for pedestrians and bicyclists. Staff will also make recommendations related to truck traffic, improving on-time performance of bus service, and providing safe access to bus stops and train stations for pedestrians and bicyclists.

Staff will then evaluate the proposed strategies and review them with participating municipal officials, agencies, and subregional group representatives.

***Products of Task 5***

Recommendations of improvements

### Task 6 Document Methodology, Findings, and Recommendations

The MPO staff will produce a final technical memorandum documenting the study's tasks and products. The final document will cover the following: study background; input from agencies, municipalities, and MAPC subregional groups; identification of problems; data collection; analyses; and recommendations. When preparing the document, staff will follow the MassDOT Highway Division's guidelines for preparing functional design reports to the extent possible considering the limits of the study's budget. A draft document will be made available for review by municipal officials, members of the subregional groups where the study segment is located, and the MassDOT Highway Division and Office of Transportation Planning. Once their comments have been addressed, the memorandum will be presented to the MPO.

***Product of Task 6***

Final technical memorandum

## Estimated Schedule

It is estimated that this project will be completed 11 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 $120,000. This includes the cost of 35.8 person-weeks of staff time, overhead at the rate of 105.66 percent, and travel. A detailed breakdown of estimated costs is presented in Exhibit 2.

KQ/MSA/msa

**Exhibit 1**
**ESTIMATED SCHEDULE**
**Addressing Safety, Mobility, and Access on Subregional Priority Roadways FFY 2018**

| Task | Month | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1. Elicit Agency, Municipal, and MAPC Subregion Input | | | | | | | | | | | |
| 2. Select Roadway Segment for Study | | | | | | | | | | | |
| 3. Collect Data | | | | | | | | | | | |
| 4. Analyze Data | | | | | | | | | | | |
| 5. Recommend Improvements | | | | | | | | | | | |
| 6. Document Methodology, Findings, and Recommendations | | | | | | | | | | | |

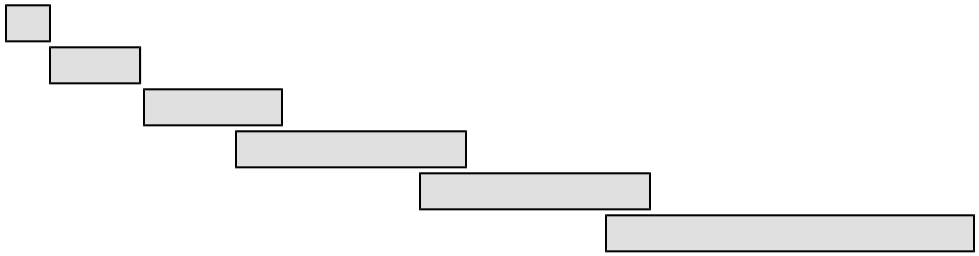

**Exhibit 2**
**ESTIMATED COST**
**Addressing Safety, Mobility, and Access on Subregional Priority Roadways FFY 2018**

| **Direct Salary and Overhead** | | | | | | | | | **$119,002** |
|---|---|---|---|---|---|---|---|---|---|
| Task | Person-Weeks | | | | | | Direct Salary | Overhead (105.66%) | Total Cost |
| | M-1 | P-5 | P-4 | P-3 | Temp | Total | | | |
| 1. Elicit Agency, Municipal, and MAPC Subregion Input | 0.2 | 1.2 | 0.0 | 0.0 | 0.0 | 1.4 | $2,656 | $2,806 | $5,463 |
| 2. Select Roadway Segment for Study | 0.8 | 2.6 | 0.0 | 0.0 | 0.0 | 3.4 | $6,436 | $6,800 | $13,237 |
| 3. Collect Data | 0.2 | 2.2 | 0.4 | 0.0 | 1.0 | 3.8 | $5,627 | $5,945 | $11,572 |
| 4. Analyze Data | 0.4 | 2.2 | 0.0 | 0.2 | 2.0 | 4.8 | $6,196 | $6,546 | $12,742 |
| 5. Recommend Improvements | 0.4 | 7.6 | 0.0 | 1.0 | 3.0 | 12.0 | $17,966 | $18,983 | $36,949 |
| 6. Document Methodology, Findings, and Recommendations | 3.0 | 6.4 | 0.0 | 1.0 | 0.0 | 10.4 | $18,983 | $20,057 | $39,040 |
| Total | 5.0 | 22.2 | 0.4 | 2.2 | 6.0 | 35.8 | $57,863 | $61,139 | $119,002 |
| **Other Direct Costs** | | | | | | | | | **$998** |
| Travel | | | | | | | | | $998 |
| **TOTAL COST** | | | | | | | | | **$120,000** |

**Funding**

MPO Planning Contract #101725
MPO §5303 Contract #98873 and subsequent MPO §5303 contract