BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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

MEMORANDUM

DATE December 15, 2016
TO Boston Region Metropolitan Planning Organization
FROM Karl H. Quackenbush, Executive Director
RE Work Program for Addressing Priority Corridors from the Long-Range Transportation Plan Needs Assessment: Federal Fiscal Year (FFY) 2017

Action Required

Review and approval

Proposed Motion

That the Boston Region Metropolitan Planning Organization (MPO) vote to approve the work program for Addressing Priority Corridors from the Long-Range Transportation Plan Needs Assessment: FFY 2017 presented in this memorandum

Project Identification

Unified Planning Work Program Classification

Planning Studies

CTPS Project Number

13276

Client

Boston Region MPO

CTPS Project Supervisors

Principal: Mark Abbott
Manager: Seth Asante

Funding

MPO Planning Contract #95411
MPO §5303 Contract #98873

Impact on MPO Work

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

Background

The Boston Region MPO's Long-Range Transportation Plan (LRTP), *Charting Progress to 2040,* identifies existing needs for all modes of transportation in the MPO region.[1] These needs guide decisions about which projects to include in the Transportation Improvement Program (TIP).[2] Among the region's current mobility needs are maintaining and modernizing the roadways that have high congestion levels and safety problems; improving the quantity and quality of venues for walking and bicycling; improving adherence to schedules of transit service; and advancing the efficiency and modernization of transit service.

For roadways, the LRTP identified several priority arterial segments that need maintenance, modernization, and safety and mobility improvements. These arterial segments were identified from previous and ongoing transportation planning work, including the MPO's Congestion Management Process (CMP), the Massachusetts Bay Transportation Authority's Program for Mass Transportation, and MPO planning studies. To help identify solutions to address the mobility and safety concerns in some of the identified arterial segments, a roadway corridor study was included in the FFY 2017 Unified Planning Work Program (UPWP).[3] In prior UPWP studies conducted in FFYs 2012 through 2016, MPO staff studied Route 203 in Boston, Route 114 in Danvers, Route 2 in Concord, Route 30 in Framingham, Route 140 in Franklin, Route 1A (the Lynnway) in Lynn, and the Vinnin Square area in Swampscott, Marblehead and Salem; several of the recommendations from those studies are already being considered.

A roadway corridor study is a logical way to address regional multimodal transportation needs, since it evaluates a roadway corridor or arterial segment comprehensively, considering the needs of pedestrians, bicyclists, motorists, public transportation users, and roadway abutters. Using a holistic approach to analyze the issues, the MPO staff develops short- and long-term recommendations for improvements within the roadway's right-of-way. The intent is to improve a roadway corridor so that it is safe for people to walk or bicycle to shops, schools, transit stations, and recreational areas, and so that buses can run on time.

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

[2] Transportation Improvement Program and Air Quality Conformity Determination, Federal Fiscal Years 2017–21, endorsed by the Boston Region Metropolitan Planning Organization on July 28, 2016.

[3] Federal Fiscal Year 2017 Unified Planning Work Program, Endorsed by the Boston Region Metropolitan Planning Organization on July 28, 2016.

In this document, an arterial segment is defined as either a portion of a roadway corridor that spans multiple towns, an entire town, or a segment that includes a few intersections in a town or near a shopping center. Within these arterial segments, there are problem locations. The arterial segments that will be considered for this study are identified in the current LRTP.

Objectives

The objectives of this study are as follows:

- Select an arterial segment from those identified in the current LRTP
- Identify the safety, mobility, access, and other transportation-related problems within the arterial segment
- Develop and evaluate multimodal transportation solutions to the problems

Work Description

Task 1 Elicit Input from Agencies and Municipalities

The MPO staff will invite municipal officials and members of subregional groups in the MPO's planning area whose jurisdictions include areas in which the arterial segments are located, as well as representatives from the Massachusetts Department of Transportation (MassDOT) Office of Transportation Planning, the MassDOT Highway Division, and the Metropolitan Area Planning Council to participate in the study. These stakeholders will advise the MPO staff about the study areas and data sources; help identify transportation-related problems; and help develop multimodal transportation solutions and recommendations. The recommendations from this study will be implemented by either municipalities or the Highway Division; therefore, it is important that the recommendations reflect those entities' experience and MassDOT design standards.

Products of Task 1

Documentation of stakeholder input

Task 2 Select Study Location

First, MPO staff will rank the arterial segments using available CMP data, such as traffic volumes, crashes, vehicle speeds, freight and truck routes, bus crowding and/or schedule adherence, traffic signal coordination, and pedestrian and bicyclists' needs. The arterial segment considered for study will be segment that could benefit from improvements related to sidewalks and crosswalks, access management, traffic control and operations (including traffic signal upgrades and coordination), and potential redevelopment. In addition, the study proponent, highway jurisdiction agency, and municipalities in which the arterial segments are located would need to be committed to advancing the

recommendations of the study into a project through the Highway Division's project development process.

A number of criteria will be applied to prioritize each arterial segment that is a candidate for study:

- Safety Conditions:
  - High crash rates above the Highway Division's district average
  - Contains intersection(s) on MassDOT's Top 200 High Crash Intersection Locations Report
  - Contains a crash cluster that ranks within the top five percent of crash locations in the region (eligible for Highway Safety Improvement Program funding)
  - Significant number of pedestrian and bicycle crashes (two or more crashes per mile)
- Congested Conditions:
  - Poor levels of service and delays
- Multimodal Significance:
  - Carries at least one bus route
  - Adjacent to a transit stop or station
  - Supports bicycle or pedestrian activities, but has a need for improvements for those modes
  - Lacks bicycle or pedestrian accommodation
  - Carries a high volume of truck traffic that supports regional commerce (five percent or more)
  - A project is already planned or in process to enhance multimodal transportation
- Regional Significance:
  - Carries large percentage of the regional traffic that serves economic, cultural, or recreational development not immediately in the corridor
  - National Highway System roadway
  - Located in environmental justice area
- Implementation Potential:
  - Strong commitment from the community to implement study recommendations
  - Endorsement by the subregional group
  - Endorsement by the agency that oversees the roadway
  - Strong support from other stakeholders
- Regional Equity:
  - Contributes to the goal of having study locations that are distributed throughout the MPO's planning area over time and transportation equity

Then, based on the rankings of the arterial segments and considering stakeholder support for implementing the study's recommendations, the MPO

staff will select an arterial segment for this study. This recommendation, along with the full list of segments from the LRTP, will be presented to the MPO for discussion. When the MPO approves the choice of study location, the MPO staff will work in conjunction with transportation agency and municipal officials to identify the problem locations within the arterial segment. These locations will be the focus for developing multimodal transportation improvements on the arterial segment.

To this end, staff will identify the safety, operational, and mobility problems facing pedestrians, bicyclists, motorists, and transit users, as well as transit service deficiencies (connectivity and linkage problems). Staff also will identify truck traffic issues, such as crash locations with unusually high truck involvement, turning-radius issues at intersections, heavy truck volumes adding to congestion, and points where trucks conflict with cars, pedestrians, or bicyclists. In addition, MPO staff will review the Highway Division and MPO's project information databases and contact municipalities to identify projects and studies that have already been planned for or implemented on the arterial segment.

Products of Task 2

A technical memorandum that will include documentation of the following:

- Safety, operational, and mobility problems facing pedestrians, bicyclists, motorists, and transit users
- Transit service issues, including service deficiencies (connectivity and linkage problems)
- Truck traffic issues
- Projects and studies already planned for the arterial segment
- Rationale for the final selection of the study location
- Final selected arterial segment

Task 3 Collect and Gather Data

Once the problem locations within the arterial segment have been identified, staff will gather recent and historical data from existing sources, including studies performed by municipalities or proponents of private development projects, and databases maintained by the MPO staff and the Highway Division. Some data will need to be collected in the field. The following data likely will be gathered for the arterial segment:

- Turning-movement counts for the AM and PM peak periods, including for trucks, pedestrians, and bicyclists, and average annual weekday traffic data from automatic traffic recorder (ATR) counts
- Traffic signal timing plans and coordination settings; signage; and lane configurations
- Bus service performance data and locations of stops, signage, and shelters

- Truck traffic data
- Right-of-way, pavement widths and conditions, sidewalk widths and conditions, and the condition and signage at midblock crossings
- Already planned development projects, development mitigation proposals, and proposed transportation projects
- Crash statistics, crash rates, and crash diagrams for locations that have crash rates exceeding the Highway Division's district average

Products of Task 3

- Files of various kinds of data for assessing safety, mobility, and operational performance at the problem locations, including roadway inventory data and an inventory of bus service and performance data
- A list of already planned economic development and transportation improvement proposals for the arterial segment

Task 4 Analyze Data

Based on analyses performed in similar past studies and the need to provide Complete Streets—where pedestrians, bicyclists, motorists, and transit riders of all ages and abilities can move along and across a street safely—staff anticipate performing the following tasks:

- Analyze crash data and prepare crash diagrams to confirm safety concerns and identify possible improvements
- Evaluate the need for installing new sidewalks, replacing broken and crumbling sidewalks, and providing continuity of sidewalks
- Evaluate the need for improving midblock pedestrian crossings by adding new ones; installing pedestrian crosswalk flashing beacons; improving signage at or near midblock pedestrian crossings; and/or making crossings accessible
- Assess potential safe and economical means of accommodating bicyclists—for example, by adding protected bike lanes, providing adequate shoulders, and allowing bicyclists to share the road with motorists
- Analyze crash and traffic volume data and intersection turning-radius data to determine potential truck traffic safety improvements
- Conduct analyses of traffic signal warrants, signal retiming plans, and signal coordination to determine appropriate intersection traffic controls and the best signal timing plans for the safe and efficient movement of pedestrians, bicyclists, and motorists
- Assess the need for upgrading traffic signal equipment to comply with Americans with Disabilities Act (ADA) requirements for signalized intersections

- Evaluate the on-time performance of bus service, bus stop placement in relation to demand and pedestrian activity, and the need for bus signs and shelters

Products of Task 4

Crash analysis tables, intersection crash diagrams, delay and queue calculations, tables of bus performance statistics, and maps and other graphics showing pedestrians and bicyclists' activities

Task 5 Recommend Improvements: Pedestrian Mobility, Traffic Operations, Bus Service, and Safety

Based on the results of consultation with agency and municipal officials and the analyses described above, staff will recommend geometric, traffic control, pavement rehabilitation, roadway enhancement, and other changes to improve traffic operations and truck movement, with an emphasis on the effective, safe accommodation of pedestrians and bicyclists. Additional recommendations will suggest improvements to allow buses to run on time, and to make it safe for people to walk to and from bus stops and train stations.

Products of Task 5

Recommendations for addressing pedestrian, bicyclist, and motorist safety; accommodation of pedestrians, bicyclists, and transit users; other traffic operations issues, including trucks; and bus service issues

Task 6 Document Results

Documentation will be in the form of a report or a technical memorandum on the following subjects: background of the study, agency and municipal input, identification of problems, data collection, analyses, and recommendations. The document will follow the Highway Division's guidelines for preparation of functional design reports as much as possible, taking into consideration the study's budget. The document will be available for review by municipal officials, members of the subregional group in which the arterial segment is located, the Highway Division, and the Office of Transportation Planning. After their comments have been addressed, the final document will be presented to the MPO.

Products of Task 6

A final report or memorandum documenting all of the project's tasks and products, including recommendations

Estimated Schedule

It is estimated that this project will be completed nine 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 $110,000. This includes the cost of 35.2 person-weeks of staff time, overhead at the rate of 102.7 percent, travel, and other direct costs. A detailed breakdown of estimated costs is presented in Exhibit 2.

KQ/MSA/msa

Exhibit 1
ESTIMATED SCHEDULE
Addressing Priority Corridors for the Long-Range Transportation Plan Needs Assessment: FFY 2017

Task	Month								
	1	2	3	4	5	6	7	8	9
1. Elicit Input from Agencies and Municipalities	A								
2. Select Study Locations	B								
3. Collect and Gather Data		C							
4. Analyze Data		D							
5. Recommend Improvements				E					
6. Document Results	F								

Products/Milestones

- A: Documentation of stakeholder input
- B: Technical memorandum
- C: List and files of data and information collected
- D: Documentation of analysis
- E: Study recommendations
- F: Final report or memorandum

Exhibit 2
ESTIMATED COST
Addressing Priority Corridors for the Long-Range Transportation Plan Needs Assessment: FFY 2017

Direct Salary and Overhead	**$109,810**

Task	Person-Weeks					Direct Salary	Overhead (102.70%)	Total Cost
	M-1	P-5	P-4	Temp	Total			
1. Elicit Input from Agencies and Municipalities	0.4	1.4	0.0	1.0	2.8	$3,830	$3,933	$7,763
2. Select Study Locations	1.0	2.0	0.0	2.0	5.0	$6,534	$6,711	$13,245
3. Collect and Gather Data	0.1	2.0	1.4	2.0	5.5	$6,803	$6,986	$13,789
4. Analyze Data	0.4	4.4	2.0	1.1	7.9	$12,165	$12,494	$24,659
5. Recommend Improvements	0.4	4.0	2.0	0.0	6.4	$10,867	$11,160	$22,027
6. Document Results	3.0	4.6	0.0	0.0	7.6	$13,975	$14,352	$28,327
Total	5.3	18.4	5.4	6.1	35.2	$54,174	$55,636	$109,810

Other Direct Costs	**$190**
Travel	$190

TOTAL COST	**$110,000**

Funding

MPO Planning Contract #95411
MPO 5303 Contract #98873