



BOSTON REGION 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 15, 2009
TO Transportation Planning and Programming Committee
of the Boston Region Metropolitan Planning Organization
FROM Arnold J. Soolman, CTPS Director
RE Work Program for: Safety and Operations Analyses at Selected
Intersections

ACTION REQUIRED

Review and approval

PROPOSED MOTION

That the Transportation Planning and Programming Committee of the Boston Region Metropolitan Planning Organization vote to approve the work program for Safety and Operations Analyses at Selected Intersections in the form of the draft dated October 15, 2009.

PROJECT IDENTIFICATION

Unified Planning Work Program Classification
Planning Studies

CTPS Project Number
13246

Client
Boston Region Metropolitan Planning Organization

CTPS Project Supervisors
Principal: Efi Pagitsas
Manager: Mark Abbott

Funding
MassHighway 3C PL Contract #TBD

IMPACT ON MPO WORK

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

BACKGROUND

This study was one of the recommendations from the MPO's Congestion Management Process (CMP). Typically, intersections dictate the quality of flow along an arterial, and, when improvements are made to their operations and safety, the processing capacity of that arterial can increase as a result. This is a desirable outcome as it can prevent the addition of lanes becoming necessary and thus result in fewer vehicle miles of travel and avoid use of a neighborhood street as a "cut-through." In addition, the "promotion of efficient system management and operations" is one of the planning factors in recent federal legislation. The concept of "efficient operations" must be integrated into the existing planning process, including the Regional Transportation Plan, the Transportation Improvement Program, and the Unified Planning Work Program, in order to sustain the region's arterial roadway system through improved management and operations. Even more importantly, when intersections are managed and operated efficiently, usually safety improves as well.

This study's purpose is to evaluate up to 12 intersections from throughout the region and to develop recommendations for improvements intended to enhance the intersections' operations and the safety of drivers, bicyclists, and pedestrians. The selected intersections may or may not call for improvements requiring right-of-way acquisition. Locations will be selected only if they are not currently under study by MPO staff or by others, or under design. Finally, locations will be selected based on staff interaction with municipal officials and the officials' interest in project implementation.

OBJECTIVE

This study seeks to accomplish the following objective: to identify improvements that address operational and safety problems at up to 12 intersections in the Boston Region MPO area.

WORK DESCRIPTION

Task 1 Select Intersections

This task will initially identify approximately 25 intersections throughout the region that have low levels of service and high vehicle crash levels. Staff will generate this group of intersections by employing a variety of strategies:

- Coordinating with MAPC to receive input from cities and towns

- Reviewing TIP projects from the conceptual and pre-TIP categories
- Reviewing intersection delay data from CMP monitoring
- Reviewing the most recent Massachusetts Registry of Motor Vehicles (RMV) data

Up to 12 intersections will be selected from the initial 25 based on criteria in the following categories:

- Safety (Equivalent Property Damage Only [EPDO] crashes)
- Community (regional equity)
- Community Interest in Following Up with Implementation

Regarding the last criterion, staff will coordinate with the involved communities to (a) receive their input to the process with respect to appropriate intersections to be studied and (b) discuss communities' interest in and mechanisms for following up with implementing eventual recommendations.

Product of Task 1

A table listing up to 12 intersections throughout the region from the sources referenced above. The table will include information explaining why the 12 intersections were chosen using safety, regional equity, and municipal interest in implementation as criteria. If the TPPC so desires, staff will make a presentation on the selection process and results to the Committee.

Task 2 Perform Field Reconnaissance and Collect Data

Once the set of up to 12 intersections has been selected, staff will collect detailed data and information pertaining to each location. This will involve visiting each site and inventorying all relevant geometric, land use, and signal features. Data will include:

- Manual turning movement counts (MTMCs)
- Bicycle counts
- Pedestrian counts
- Signal timing data (phases, timing lengths)
- Queue lengths
- Geometric data (lanes, curb cuts, sidewalks, crosswalks, pedestrian buttons)
- Land use/zoning information
- Jurisdictional/administrative system responsibilities

Products of Task 2

Summaries of count, signal, queue, and geometric data, as well as land use and jurisdictional information, for the final group of selected intersections.

Task 3 Evaluate and Analyze Selected Intersections

Staff will evaluate each intersection using various types of analysis. First, the crash data for each intersection will be analyzed with regard to crash type and severity and whether bicycles or pedestrians were involved in the crashes. Second, capacity analysis will be performed in order to determine the operational level of service at each signalized or unsignalized intersection. Particular attention will be given to the evaluation of existing pedestrian signal phases, if any, or the need for them. Third, field observations will yield a full understanding of safety levels and of the operations of vehicles, bicycles, and pedestrians at each location.

Products of Task 3

Summaries giving each of the 12 intersections' incidence and types of crashes, its operational level of service, and an overall assessment of how safe or unsafe it is and how well or how poorly traffic is processed through it.

Task 4 Receive Input from MassHighway and Local Officials

Once staff have analyzed the selected intersections, MassHighway District Office staff and local officials in each community involved will be contacted in order to discuss the intersection summaries, receive input on analysis and findings, and discuss potential improvements, including potential actions to promote implementation. The combined comments generated by local and state officials will steer the development of all final recommended improvements.

Product of Task 4

A summary of discussions and interactions with MassHighway District Office staff and local officials with respect to the preliminary findings.

Task 5 Recommend Improvements

Based on the evaluation and analysis performed in Task 3 and on the feedback given by local and MassHighway officials, staff will recommend specific measures to improve operations and safety levels at the selected intersections. The costs will be estimated and the jurisdictional entity responsible for implementation identified.

Product of Task 5

A list of recommended operational and safety improvements for the selected intersections.

Task 6 Document All Findings and Recommendations

Staff will document all study tasks in a technical memorandum. Each of the communities involved will also receive a condensed memorandum providing the analysis and recommendations pertaining to its particular intersection(s).

Product of Task 6

A technical memorandum documenting Tasks 1 through 5, including documentation of the correspondence with municipal officials with respect to a course of action for implementation.

ESTIMATED SCHEDULE

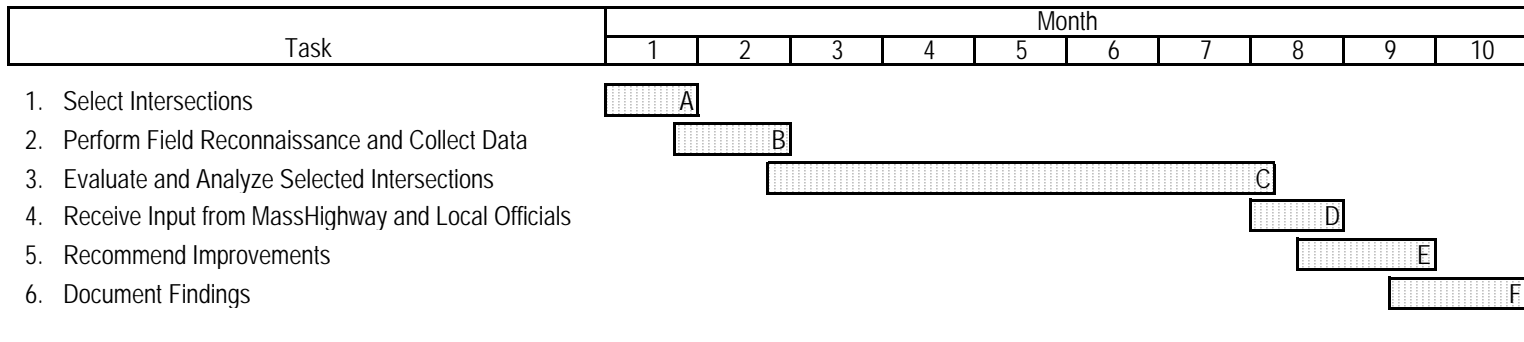
It is estimated that this project will be completed 10 months after the notice to proceed is received. The proposed schedule, by task, is shown in Exhibit 1.

ESTIMATED COST

The total cost of this project is estimated to be \$64,081. This includes the cost of 23.0 person-weeks of staff time, overhead at the rate of 88.99 percent, and travel. A detailed breakdown of estimated costs is presented in Exhibit 2.

AJS/EP/ep

Exhibit 1
ESTIMATED SCHEDULE
Safety and Operations Analyses at Selected Intersections



Products/Milestones

- A: Products of Task 1
- B: Products of Task 2
- C: Products of Task 3
- D: Products of Task 4
- E: Products of Task 5
- F: Final Technical Memorandum

Exhibit 2
 ESTIMATED COST
 Safety and Operations Analyses at Selected Intersections

| | |
|-----------------------------------|-----------------|
| Direct Salary and Overhead | \$63,381 |
|-----------------------------------|-----------------|

| Task | Person-Weeks | | | | Direct Salary | Overhead (@ 88.99%) | Total Cost |
|---|--------------|------|------|-------|---------------|---------------------|------------|
| | M-1 | P-5 | Temp | Total | | | |
| 1. Select Intersections | 0.1 | 2.0 | 0.0 | 2.1 | \$3,354 | \$2,985 | \$6,339 |
| 2. Perform Field Reconnaissance and Collect Data | 0.0 | 3.0 | 3.0 | 6.0 | \$6,313 | \$5,618 | \$11,931 |
| 3. Evaluate and Analyze Selected Intersections | 0.0 | 5.0 | 0.0 | 5.0 | \$7,976 | \$7,098 | \$15,074 |
| 4. Receive Input from MassHighway and Local Officials | 0.0 | 1.5 | 0.0 | 1.5 | \$2,393 | \$2,129 | \$4,522 |
| 5. Recommend Improvements | 0.4 | 3.0 | 0.0 | 3.4 | \$5,441 | \$4,842 | \$10,282 |
| 6. Document Findings | 2.0 | 3.0 | 0.0 | 5.0 | \$8,060 | \$7,173 | \$15,233 |
| Total | 2.5 | 17.5 | 3.0 | 23.0 | \$33,537 | \$29,845 | \$63,381 |

| | |
|---------------------------|--------------|
| Other Direct Costs | \$700 |
|---------------------------|--------------|

| | |
|--------|-------|
| Travel | \$700 |
|--------|-------|

| | |
|-------------------|-----------------|
| TOTAL COST | \$64,081 |
|-------------------|-----------------|

Funding
 Massachusetts Highway Department 3C PL Contract #TBD