BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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Jeffrey B. Mullan
MassDOT Secretary and CEO
and MPO Chairman

Arnold J. Soolman
Director, MPO Staff

MEMORANDUM

DATE **December 16, 2010**

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, FFY 2011**

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 December 16, 2010.

PROJECT IDENTIFICATION

Unified Planning Work Program Classification
Planning Studies

CTPS Project Number
13253

Client
Boston Region Metropolitan Planning Organization

CTPS Project Supervisors
Principal: Efi Pagitsas
Manager: Chen-Yuan Wang

Funding
MassDOT 3C PL Contract #66104
MassDOT §5303 Contract #MA 80-005

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 acts on recommendations generated by the MPO's Congestion Management Process (CMP) to address safety and congestion problems at intersections in the MPO region. Three similar studies in previous funding years are completed or underway and have received favorable responses from municipal administrators and department of public work directors. Municipalities in the region are receptive to this type of study, as it gives them potential low-cost solutions or a head start on conceptual design for intersections in need of attention for safety improvements and congestion mitigation.

Typically, intersections dictate the quality of flow along an arterial, and therefore when improvements are made to their operations and safety, the safe processing capacity of that arterial can increase as a result. This can prevent the addition of traffic lanes from becoming necessary, result in fewer vehicle miles of travel, reduce use of neighborhood streets as "cut-throughs,"and enhance the reliability of any transit vehicles traversing the intersection. In addition, this type of work assists in "promoting efficient system management and operations," one of the planning factors in the MPO's regional planning process. Most importantly, when intersections are managed and operated efficiently, safety improves as well.

This study's purpose is to evaluate up to 10 intersections[1] for safety and operations improvements. Intersections anywhere in the region will be eligible to be selected for study, and the improvement recommendations will be intended to enhance the intersections' operations for all vehicles, including transit vehicles, 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. One important basis for intersection selection will be staff interaction with municipal officials and the officials' interest in project implementation.[2] Other criteria are described below under Task 1.

[1] The number of intersections selected for study will depend on the complexity of the analysis required by the selected locations. That is, if some of the intersections that are given highest priority for inclusion in the study require particularly time-consuming analysis, the number of intersections studied may be fewer than 10.

[2] The CMP intersection survey launched by the Boston Region MPO in June 2010 is an additional important source of information to use in selecting intersections. The MPO has received considerable feedback and suggestions about intersection safety and operations from the public and municipal officials. Staff will review the suggested intersections' crash rates and other traffic information in order to develop a list of intersections to give priority for attention.

OBJECTIVE

This study will identify improvements that address operational and safety problems at up to 10 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:

- Reviewing public feedback received in the MPO's CMP intersection survey through the MPO website.
- In coordination with MAPC, soliciting selection recommendations from MAPC Subregions and individual cities and towns that will declare their commitment to shepherding the recommended improvements to design and implementation.
- Reviewing the most recent Massachusetts Department of Transportation (MassDOT) Registry Division crash data.
- Reviewing TIP projects from the conceptual and pre-TIP categories.
- Reviewing intersection delay data from CMP monitoring.

Up to 10 intersections will be selected for consideration from the initial 25 based on criteria in the following categories:

- Safety (Equivalent Property Damage Only [EPDO] crashes)
- Regional equity
- Strong indication from the community that it will follow 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 10 intersections throughout the region, selected as described above. The table will include information explaining why the 10 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 10 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
- Transit vehicle counts
- Signal timing data (phases, timing lengths)
- Queue lengths
- Geometric data (lanes, curb cuts, sidewalks, crosswalks, pedestrian buttons, transit amenities)
- 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 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 selected 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 Develop Improvement Alternatives and Receive Input from MassHighway and Local Officials

Based on the evaluation and analyses, staff will develop potential improvement alternatives. Staff will contact MassDOT Highway Division District Office staff and local officials in each community involved 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 MassDOT Highway Division 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 MassDOT Highway Division officials, staff will recommend short- and long-term measures to improve operations and safety levels at the selected intersections. Recommendations will include improvements for transit, specifically buses, which may pass through the intersection; these could include curb extensions, bus stop relocations, and Transit Signal Priority options. The cost of the measures will be estimated and the jurisdictional entity responsible for implementation identified.

Product of Task 5

A summary 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 technical 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, for each of the selected intersections; a technical memorandum summarizing the study as a whole

ESTIMATED SCHEDULE

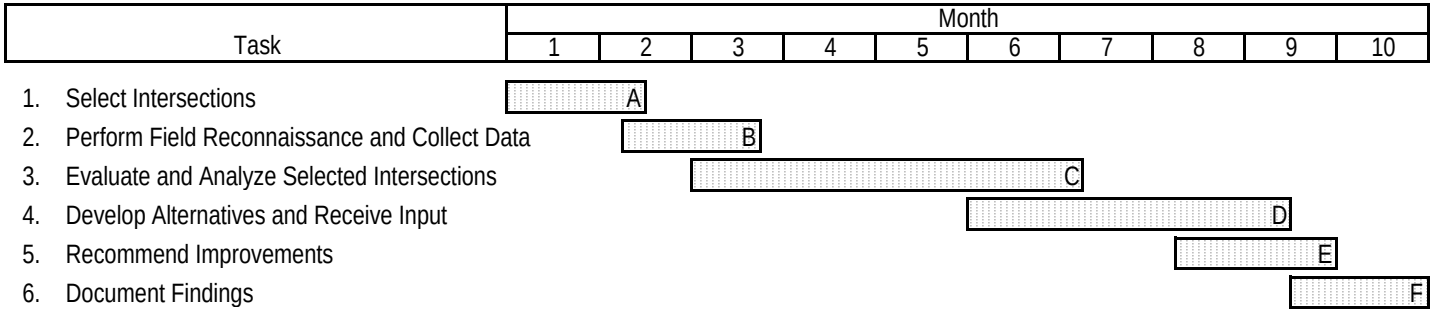
It is estimated that this project will be completed 10 months after the notice to proceed is received. The proposed schedule, by task, is shown in Exhibit 1.

ESTIMATED COST

The total cost of this project is estimated to be $70,194, and will be made up of $58,294 in PL funds and $11,900 in Section 5303 funds. The total cost includes the cost of 26.7 person-weeks of staff time, overhead at the rate of 90.69 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, FFY 2011



Products/Milestones

A: A table of the selected intersections with information on basis for selection
B: Summaries of count, traffic control, geometric, and land use data
C: Summaries of crash data and intersection capacity analyses; overall assessment of the intersections
D: Summary of discussions and interactions with communities and MassDOT Highway Division District Offices
E: Summaries of recommended operational and safety improvements
F: Final technical memoranda

Exhibit 2
ESTIMATED COST
Safety and Operations Analyses at Selected Intersections, FFY 2011

Direct Salary and Overhead	$69,854

Task	Person-Weeks						Direct Salary	Overhead (@ 90.69%)	Total Cost
	M-1	P-5	SP-3	SP-1	Temp	Total			
1. Select Intersections	0.2	2.5	0.0	0.0	0.0	2.7	$4,316	$3,914	$8,229
2. Perform Field Reconnaissance and Collect Da	0.0	2.0	1.0	1.0	4.0	8.0	$6,625	$6,008	$12,633
3. Evaluate and Analyze Selected Intersections	0.0	2.5	0.0	0.0	0.0	2.5	$3,988	$3,617	$7,605
4. Develop Alternatives and Receive Input	0.5	3.5	0.0	0.0	0.0	4.0	$6,402	$5,806	$12,208
5. Recommend Improvements	1.0	2.0	0.0	0.0	0.0	3.0	$4,828	$4,378	$9,206
6. Document Findings	2.5	4.0	0.0	0.0	0.0	6.5	$10,474	$9,499	$19,973
Total	4.2	16.5	1.0	1.0	4.0	26.7	$36,633	$33,222	$69,854

Other Direct Costs	$340
Travel	$340

TOTAL COST	$70,194

Funding

MassDOT 3C PL Contract #66104 ($58,294) and Section 5303 Contract #MA 80-005 ($11,900)