BOSTON REGION METROPOLITAN PLANNING ORGANIZATION
Richard A. Davey, MassDOT Secretary and CEO and MPO Chairman
Karl H. Quackenbush, Executive Director, MPO Staff

MEMORANDUM

DATE **December 6, 2012**

TO **Lourenço Dantas,**
Chairman
Boston Region MPO Congestion Management Committee

FROM **Ryan Hicks, Efi Pagitsas, and Pam Wolfe**
MPO Staff

RE **TIP Program for Intersection Improvements**

Introduction

The MPO has allocated an amount of approximately $350,000 in the FFY 2014 element of the FFYs 2013-2016 Transportation Improvement Program (TIP) to fund an intersection improvements implementation program. The impetus for this program is federal guidance for the development of the Congestion Management Process (CMP), where identified congestion, mobility, and safety needs, once studied for improvement recommendations, are addressed by funding the construction of relevant and effective improvements.

The focus of this program would be low-cost, small scale, and quickly implementable improvements, including signal retiming and, possibly signs and pavement markings. Typically, the cost of such improvements is very small, in the vicinity of less than $10,000 for each location. These improvements qualify for TIP-funding and could be implemented within a program instead of as individual projects. These types of improvements, known as transportation system management (TSM) or management and operations (M&O), enjoy a high benefit-to-cost ratio. The Boston Region MPO wishes to capitalize on this fact by identifying these problem locations and addressing the problems in a low cost way.

There is no existing framework at MassDOT for this type of program involving designing and constructing MPO-identified low-cost intersection improvements. Developing this program calls for MassDOT and FHWA cooperation with the MPO in identifying an approved process for implementing this program in the Boston Region.

The aim of this memo is to provide a clear statement about the program purpose and objectives, identify issues and obstacles, and discuss possible next steps in implementing this program.

Progress to Date

In anticipation of FFY 2014, when the funding can be spent for improvements, the Chair of the Boston Region MPO Congestion Management Committee consulted with staff of MassDOT, the MPO (CTPS), and the Chair of the MPO's Clean Air and Mobility Committee (an MPO committee that has overseen similar programs). The following persons were involved in two discussions about how to define, procure, and manage this program:

- Eric Bourassa, MAPC, Chair, MPO Clean Air and Mobility Committee
- Marie Rose, MassDOT
- Bill Palmer, MassDOT
- Lourenço Dantas, MASSPORT
- Pam Wolfe, MPO staff
- Sean Pfalzer, MPO staff
- Anne McGahan, MPO staff
- Ryan Hicks, MPO staff
- Hiral Gandhi, MPO staff
- Efi Pagitsas, MPO staff

Program Purpose

To fund low-cost and short-term improvements to either MassDOT- or municipally-owned roadways, as recommended in MPO United Planning Work Program (UPWP) studies.

Objectives

- To implement a program of low-cost, high-benefit roadway improvements
- To benefit MassDOT and/or municipal roads with a focus on low-cost, small scale and quickly implementable improvements
- To integrate the Congestion Management Process (CMP) (where the MPO intersection studies are generated) with the UPWP (where the studies are funded), and the TIP (where projects are programmed for implementation).
- To adhere to MAP-21 regulation about implementing Management and Operations (M & O) type improvements to address bottlenecks, safety, operational, and other multimodal improvements.
- To adhere to MAP-21 requirements for monitoring roadway performance.

Experiences from Other States and MPOs

Implementing low-cost improvements, especially traffic signal retiming, is performed in other states where MPOs and DOTs coordinate to analyze locations, select priorities, design, and construct the improvements. Below are two examples:

Delaware

WILMAPCO, the New Castle County MPO, coordinates with DelDOT's Traffic Management Center (TMC) to perform intersection signal retiming on a priority basis. "Intersection Improvements" is a program funded in the TIP. Design is done in-house or by consultants hired by the DOT. Usually retiming and other minor improvements are implemented within 2 to 3 months. Unlike the case in Boston region MPO, all roads in WILMAPCO are owned and maintained by DelDOT, which promotes a rather uncomplicated implementation.

Florida

The Orlando Metro has a $4,000,000 TIP program of which $2,000,000 are dedicated to traffic signal retiming exclusively. Metro and FDOT participate in the Management and Operations (M & O) Committee, which identifies priority locations due for retiming improvements. Through FDOT's Local Area Program (LAP), FDOT signs agreements with local jurisdictions responsible for the roadway maintenance to hire consultants for design and implementation of retiming improvements.

Ohio

ODOT funds a retiming program under its Safety & Congestion Program. Any local agency may request to have their signals retimed. ODOT has task order consultants to do all work, including traffic counts, field work, model creation, and timing optimization. Program can be as "turnkey" as local agency wishes. Program has extremely high benefit-to-cost ratio and is run by ODOT's District Safety Review Team (DSRT). Local match enhances potential for project funding.

Examples of Funding Small Improvements in Massachusetts

Clean Air and Mobility Program, Newton Signal Retiming Project

The MPO has a Clean Air and Mobility Program that funds a wide variety of projects that improve air quality and mobility and that reduce congestion in the region using federal Congestion Mitigation and Air Quality (CMAQ) funds. An example of a project that was funded through this program is the Citywide Traffic Signal Timing Improvement in the City of Newton. The majority of the traffic signals in Newton ran on a fixed timing program throughout the day and did not adjust to changes in traffic flow, direction, or intensity caused by commuting demands. Many of the signals were running on the same program timing since they were originally built and were not updated to reflect shifts in travel patterns. The City hired a consultant who created a computer-based traffic model of all of the traffic signals within the study area. Changes to timing patterns were recommended and signal timings were changed at over 70 traffic signals citywide. This project was administered by the City.

STOP-Controlled Intersections Project

This was federally-funded pilot program to install/replace warning signs ahead of STOP-controlled intersection approaches, including replacing outdated STOP signs, to improve crash rates at STOP-controlled intersections. Municipal participation was voluntary and included providing design of the intersection with the existing location and size of STOPs and other signs. A contractor would be responsible for installing the new signs at predetermined points on the intersection approaches. According to MassDOT staff, municipal participation was rather low and proved a difficult project to manage.

Safe Routes to School

Safe Routes to School is a federally-funded program that implements capital improvements and other strategies to enable students to walk and bike to school in a safer environment. Safe Route to School projects requires no local funding match. Safe Route to School programs are administered by Safe Route to School task forces, consisting of local volunteers including school officials, teachers and local officials from planning, safety and public works departments.

In Massachusetts, educational institutions collaborate with MassDOT to receive program services and assistance that includes: technical assistance, customized program design and implementation, pedestrian and bicycle trainings, educational materials and programs, student incentives and rewards, and safety enhancements as well as operational and physical improvements to roadways surrounding schools. Currently, there are eight Safe Routes to School projects programmed in the Fiscal Year 2013–16 TIP, and project costs typically range from $430,000 to $770,000. For Safe Routes to School projects, MassDOT contracts with a third party consultant who plans and designs the project. MassDOT engineers review the project internally and solicit the project for bids to construct, when the design is complete.

Implementation Options and Roadway Ownership

The intersection improvement implementation program is currently a one year program that is funded for $350,000. It is not known if this program will continue after the one year period is over. This program is for the funding, with federal funds, of low cost improvements such as pavement striping and traffic signs. If using federal funds of any amount, the FHWA requires MassDOT to incorporate a design and engineering process, which may result in an increase of the project cost, due to the comprehensive review conducted by MassDOT (in compliance with federal requirements) and resulting add-ons to the project.

MassDOT does not prefer to become involved with projects under $100,000 in costs, due to the relative expense of staff time for design review and administration.

These are obstacles to the program. To implement the program, the CM Committee must figure out a procedure for funding small projects, without involving the design and engineering phases that may cause delays, and the increase in project costs. The workgroup hopes to work with the FHWA in the near future to collaborate on a structured solution to this problem.

MassDOT-owned Roadways

Presently, for MassDOT-owned roadways, MassDOT highway districts use maintenance funds to implement minor improvements, like markings, signs, and signal retimings. Typically, these jobs are less than $10,000 and often up to $100,000. The jobs are done by district staff or through district-wide contracts and betterment funds. Low-cost, short-term MPO study recommendations for MassDOT-owned roadways have often been implemented in this manner by MassDOT district staff. This has included, for example, recommendations from bottleneck studies along I-95 and recommendations from studies such as Safety and Operational Improvements at Selected Intersections. It is expected that this practice would continue in the future. However, if these improvements are implemented through a formal program between MassDOT and the MPO, they would stand a higher chance of implementation.

Municipally-owned Roadways

Presently, it is unclear how to implement this program for municipally-owned roadways. There are the following areas of issues:

- Design
- Construction
- Supervision/Project Management

Typically, for TIP-funded projects, municipalities are responsible for the design of improvements for roadways that they maintain. Municipalities can use Chapter 90 funds for design; however, according to the municipal stakeholders these funds are insufficient for systematic and comprehensive roadway maintenance. Through innovative thinking, many municipalities coordinate with developers and make design and improvements feasible through development mitigation funds.

Under the Massworks Infrastructure Program, municipalities with less than 7,000 in population are eligible to apply for design/engineering cost along with the construction costs. Municipalities that have more than 7,000 in population are eligible to apply for design/engineering costs along with the construction costs, but the design/engineering costs must not exceed 10 percent of the total grant request.

As federal funds would be expended for construction in this program, design and construction would have to be reviewed and supervised by MassDOT staff. One option that might make the design and construction oversight process more flexible and compatible with the low-cost nature of the Intersection Improvement Program projects

may be that this is done at the Highway Division district level, where staff is familiar with selected locations. Another option may be that MassDOT enters into a contract with municipalities who hire consultants for design and construction and MassDOT oversight is skipped. However, the latter may need to meet with the approval of FHWA.

Challenges and Major Questions to Answer

There is no existing framework at MassDOT for this type of program involving designing and constructing MPO-identified low-cost intersection improvements. Developing this program calls for MassDOT and FHWA cooperation with the MPO in identifying an approved process for implementing this program in the Boston Region.

The following questions remain unresolved:

- Can some types of intersection improvement projects be designed and constructed without the full MassDOT design review and construction review processes? For example, for intersection improvements on MassDOT-owned roadways, can design be done in-house? Or for municipally-owned roadways, can funds be contracted directly to the municipalities for the design and construction?
- Can the Intersection Improvement Program be operated on a programmatic basis with a contractor hired to do all the designated improvements in various qualifying municipalities? May projects be bundled together? Can a single contractor design and construct the projects?

Potential Next Steps

1. Form an Intersection Improvement Program team (including CM Committee, and appropriate MassDOT and MPO staff persons) to meet and discuss which options are possible and what direction should be taken for implementation.
2. Consult with MassDOT (and possibly the FHWA) to see if there is a possibility that a less facilitated design process can transpire, where MassDOT is not required to review the design. This would lift the requirements that often cause project scopes and costs to increase.
3. Determine which recommended projects from the Congestion Management Process would qualify for the Intersection Improvement Program. These recommended projects have already been assessed through the CMP and have been identified as viable solutions to problem areas.
4. Establish a process for project selection and administration.

After presenting these findings to the CM Committee, staff recommends that the CM Committee Chairman consult with the MPO Chairman about how to resolve the remaining questions related to setting up the Intersections Improvements Program. The

MPO Chairman (Director of MassDOT Planning), along possibly with his counterpart in MassDOT's Highway Division, could draw from their experience with other similar programs and play a catalytic role in the development of this program.

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