Memorandum for the Record
Transportation Planning and Programming Committee of the
Boston Region Metropolitan Planning Organization (MPO)

December 16, 2010 Meeting
10:30 AM – 1:20 PM, State Transportation Building, Conference Rooms 2 & 3, 10 Park Plaza, Boston
David Mohler, Chair, representing Jeffrey Mullan, Secretary and Chief Executive Officer, Massachusetts Department of Transportation (MassDOT)

Decisions

The Transportation Planning and Programming Committee voted to take the following actions:

- approve the minutes of the meetings of November 18 and December 2
- approve the work program for *Safety and Operations Analyses at Selected Intersections, FFY 2011*

Meeting Agenda

The meeting was preceded by a reception honoring Arnie Soolman, Director of Central Transportation Planning Staff (CTPS), on his retirement. The Committee and other participants who had worked with him in the past recognized and thanked him for his 29 years as Director of CTPS and his 35 years of service to the MPO and CTPS.

1. Public Comments

There were none.

2. Chair's Report – *David Mohler, MassDOT*

D. Mohler made several announcements:

Staff has distributed a schedule of Certification Activities Group work for federal fiscal year (FFY) 2011.

Staff has provided a weblink where members can view materials distributed for the Transportation Planning and Programming Committee meetings.

The Committee will add an extra (tentative) meeting in January, on the 27th.

Eric Bourassa, Metropolitan Area Planning Council, then reported on a recent meeting that MPO staff held with staff of the Old Colony Planning Council and the Southeastern Regional Planning and Economic Development District, the two MPOs in the southern portion of the Boston Urbanized Area. The group discussed opportunities for information sharing, collaboration on Unified Planning Work Program (UPWP) studies, coordination with the regional transit agencies, specific transportation projects (Route 3, Route 18, Route 24, and South Coast Rail), and livability activities.

3. Subcommittee Chairs' Reports
E. Bourassa reported on the activities of the MPO's Clean Air and Mobility Program. Staff held two How-To seminars for members of the public on December 8 and 15. There were nine attendees at the first seminar, and 15 at the second.

4. Regional Transportation Advisory Council – *Laura Wiener, Regional Transportation Advisory Council*
The Advisory Council met on December 8 and heard presentations on the MPO's Clean Air and Mobility Program and on the development process for the Transportation Improvement Program (TIP).

5. Director's Report – *Arnie Soolman, Director, Central Transportation Planning Staff*
A. Soolman provided an update on an issue raised at the meeting of December 2 regarding a contract for Section 5303 funding. He stated that new contracts are being developed and the funding should be available to Central Transportation Planning Staff (CTPS) soon. He expressed concern, however, that the funding might not be adequate to completely fund the work in the UPWP. MPO staff and MassDOT staff are discussing this issue.

Karl Quackenbush, Deputy Technical Director of CTPS, drew members' attention to a memorandum regarding the posting of audio files of the Committee's meetings on the MPO's website. (See attached memorandum.) Staff determined that there are two options for making the audio recordings available to the public:

- The recordings could be posted immediately in a streaming audio file using the software currently available.
- Staff could investigate software programs, such as Soniclear, that provide annotation of the audio files.

Members then asked questions and provided feedback.

D. Mohler asked if staff investigated the possibility of video recording the Committee meetings. Michael Callahan, MPO Staff, replied that staff has access to video cameras and the ability to post video on YouTube, however, the video equipment is old and staff would probably have to invest in new equipment if meetings were to be regularly videoed.

Paul Regan, MBTA Advisory Board, raised the issue of staff time that would be required to operate the equipment. He also questioned whether there is a demand for this service, and suggested that staff put counters on the audio postings to see if people actually access them.

David Koses, City of Newton, and John Romano, MassDOT Highway Division, expressed preference for the first option presented by staff – posting the audio as a streaming audio file.

Mary Pratt, Town of Hopkinton, asked about the cost of the second option – using software that would annotate the meeting. K. Quackenbush replied that the software costs about $1,600. Staff would need to investigate how the annotation and segmentation of the files are accomplished.

Staff was advised to begin posting the Committee meetings on the MPO's website, and to track the number of hits on the audio files.

On another topic, Lourenço Dantas, Massachusetts Port Authority, asked for an update on the federal recertification of the MPO. Pam Wolfe, Manager of Certification Activities, MPO Staff, noted that the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) have not contacted the MPO about the outcome of the recertification review that was held last summer. Staff was expecting to learn of the outcome in late October.

6. Meeting Minutes – *Pam Wolfe, Manager of Certification Activities, MPO Staff*
A motion to approve the minutes of the meeting of November 18 was made by P. Regan, and seconded by M. Pratt. The motion passed unanimously.

A motion to approve the minutes of the meeting of December 2 was made by M. Pratt, and seconded by P. Regan. The motion passed unanimously.

7. Plan Update – *Anne McGahan, Long Range Transportation Plan Manager, MPO Staff*
Members were provided with materials showing changes that staff made, at the recommendation of the Committee, to the draft long range transportation plan (LRTP) documents that the Committee reviewed on December 2. The following changes were made to the draft Needs Assessment chapter of the LRTP on the North Corridor:

- A map showing the Boston neighborhoods was added.
- A map showing transit services cachement areas was revised to change colors so that the population density could be seen and also to show express bus routes.
- Table 2-7 was revised to provide information about residents who live in the municipality in which they work and who walk to work.
- Maps showing travel speed indices for express highways and arterials at AM and PM peak periods were added.
- Table 3-17, which shows data on the performance of bus routes, was revised to include a column for vehicle load standard (to show routes that are failing performance standards).

Members then asked questions and made comments about several topic areas in the text:

Walk to Work Data
D. Koses asked about how the Boston neighborhoods would be handled in the "walk to work" table. A. McGahan stated that those figures would be included in the chapter on the Central Corridor.

Bicycle and Pedestrian Data
D. Mohler advised staff to include weekend bicycle count data (if available for all locations) in Table 2-8, which depicts bicycle and pedestrian count data. This would provide information about whether trails are used more as commuter facilities or recreational facilities.

D. Koses suggested breaking out the data in Table 2-8 by bicyclists and pedestrians, rather than summing the two categories.

Speed Index Data
D. Mohler requested that staff revise the travel speed index maps to show the gradation of congestion in greater (roadway segment) detail, if possible.

D. Koses requested that staff provide an interpretation of the travel speed index data.

M. Pratt pointed out that the AM and PM peak traffic on Interstate 93 does not correspond as one would think (the southbound AM traffic appears heavier than the northbound PM traffic). Efi Pagitsas, Manager of Traffic Analysis, MPO staff, provided an explanation for that observation by noting that the speed index data does not relate directly to traffic volume data. Also, the travel index data is averaged over a period, rather than at peak travel times.

Tom Kadzis, City of Boston, noted that economic conditions could be a variable regarding speed index. (The most up to date speed index data for freeways is from the years 2004 to 2007.) E. Pagitsas noted that the value of the speed index data is in relative terms (how one highway segment compares to another). A. McGahan added that staff will be providing volume-to-capacity maps, as well, to provide clarity.

Bus Schedule Adherence Data
Liz Moore, Manager of Transit Service Planning, MPO Staff, provided information pertaining to Table 3-17, which shows the performance of bus routes. She noted that the MBTA evaluates schedule adherence of buses by using time-points along the routes. The figures on the table show the percent of times over the course of a month that the buses fail to reach their time-points on time. This gives an indication of which routes are experiencing minor or major schedule adherence failures. Text will be provided in the chapters to explain how schedule adherence data is collected and measured.

Members discussed the issue that a large number bus routes are failing to adhere to schedules. D. Mohler noted that a solution would be to adjust the schedules of those routes to more accurately reflect the trip times of buses that are slowed by congestion, however, that would change the headways and appear as if there were reductions in service. P. Regan remarked on the usefulness of including information about the schedule adherence failures as a means to demonstrate the failure of the road system to handle existing traffic volumes.

L. Dantas noted that the information on bus route performance and the failure of the road system to accommodate traffic volumes can lead the MPO to consider what needs to be done to improve those conditions. He noted that the data points to the need for investments to improve arterials and signalized intersections, and for strategies that help buses operate more reliably, such as transit signal priority.

D. Koses suggest adding a table on performance data for the subway system to the Needs Assessment. Staff will look into how to depict that data.

In closing, A. McGahan stated that staff will post the revised North Corridor chapter on the members' FTP site for the members to review.

8. Work Program for Safety and Operations Analyses at Selected Intersections – *Karl Quackenbush, Deputy Technical Director, Central Transportation Planning Staff*
Members were provided with the work program for *Safety and Operations Analyses at Selected Intersections, FFY 2011*. (See attached.) K. Quackenbush introduced this work program as the fourth in a series of analyses staff has conducted since 2006 to evaluate selected intersections for safety and operational improvements. These analyses are multi-modal in nature, and include consideration of pedestrians, bicyclists, and transit operations. There is an emphasis on selecting locations in municipalities where there is a high probability that the study recommendations will be implemented.

Candidate locations for study are selected based on information from the MPO's Congestion Management Process, which monitors intersection performance in the region, Registry of Motor Vehicle crash data, and from information obtained from MAPC's outreach work. This new program will draw on an additional data source, a survey that the MPO implemented this summer inviting members of the public to tell the MPO about intersections they believe are in need of attention. In selecting a final, smaller list of intersections for the study, staff will take into account crash experience, geographic equity, and community interest in implementing identified solutions.

Members made comments:

Tom Bent, City of Somerville, suggested that staff conduct follow-up to determine whether municipalities had implemented recommendations from past studies and to get feedback.

M. Pratt recommended that the MPO notify municipalities when there are opportunities to take action on safety problems, such as by using Chapter 90 monies or requesting changes to speed limits. She also agreed that it would be good to find out if municipalities have taken recommendations from the studies.

A motion to approve the work program for *Safety and Operations Analyses at Selected Intersections, FFY 2011*, was made by M. Pratt, and seconded by T. Bent. The motion passed unanimously.

9. Pavement Management System Memorandum – *Karl Quackenbush, Deputy Technical Director, Central Transportation Planning Staff, and Seth Asante, MPO Staff*

Members were provided with a memorandum titled, "Federal-Aid Eligible Boston Region MPO Roads: A Rough Estimate of Maintenance Costs for FFYs 2010 – 2014 and Recommendations on the Development of a Pavement Management System." (See attached.)

K. Quackenbush introduced the topic by reporting that the FHWA and FTA included language in their letter approving the MPO's FFY 2010 UPWP that directs MPOs to analyze the cost of maintaining federal-aid eligible, non-state owned roadways in their region. The Boston Region MPO has since included that topic as a study in its FFY 2011 UPWP, and it was assumed that a Pavement Management System would have to be instituted in order to be able to correctly estimate those costs. As a first step, staff conducted a rough cost analysis and also put together some information describing what a Pavement Management System would look like.

Seth Asante, MPO Staff, then gave a PowerPoint presentation on the findings of the preliminary analysis, which is summarized below. (See attached PowerPoint presentation.)

The study had four purposes:

- to estimate the cost of maintaining the federal-aid eligible roads in the Boston region (there are 3,463 centerline miles of federal-aid eligible roads in the Boston MPO region; 694 miles are maintained by MassDOT and 2,768 are maintained by municipalities)
- to define the principles of a Pavement Management System
- to inform the Committee of the next steps to develop a Pavement Management System
- to seek direction from the Committee on the next steps

The Massachusetts Association of Regional Planning Agencies (MARPA) and MassDOT formed a Pavement Management Subcommittee to assist MPOs in estimating maintenance costs, to explore the principles of pavement management practices, and to explore opportunities for consistent methodologies and software to be used by all the state's regional planning agencies (RPAs) and MPOs.

Pavement management systems have two components: a database of information on past pavement condition; and models and methods used to predict how pavement conditions will be in the future. The systems are designed to assist decision makers with strategies for evaluating and maintaining pavement, and to help avoid the need for expensive deep reconstruction projects.

In conducting the analysis, staff developed cost estimates for a five-year cycle using two methods: the first method is based on lane miles and the second is based on center-lane miles. Staff made the assumption that the goal would be to bring the roadways to an

"excellent" condition. If the MPO were to implement a Pavement Management System, however, it could make a policy decision about what level of condition would be acceptable. Staff determined that it would cost between $172 million and $324 million a year to bring the region's federal-aid eligible, non-state owned roadways to an "excellent" condition.

Staff believes that implementing a Pavement Management System would be beneficial for the MPO in terms of developing effective maintenance strategies, producing better cost estimates, and reducing the number of high cost deep reconstruction projects in the Transportation Improvement Program (TIP).

As a result of the analysis, staff recommends that the MPO begin to take the following actions:

- plan for a Pavement Management System
- discuss the current MPO policy regarding the use of MPO target funding for resurfacing projects (currently the MPO does not fund resurfacing)
- explore Pavement Management System policies and funding to promote investment in pavement
- define how an MPO Pavement Management System would relate to municipal systems
- identify the UPWP funding that would be required to implement a Pavement Management Program

Following the presentation, members made comments and asked questions.

M. Pratt pointed to the need for funding for municipal owned roads that are not federal-aid eligible. She said that the state should put more funding into Chapter 90 to help municipalities maintain their roads.

L. Wiener suggested that the MPO could assist municipalities in developing their own Pavement Management Systems through a study.

T. Bent expressed support for an MPO Pavement Management System. He stated that there needs to be a uniform approach to evaluating the pavement condition of roads.

Richard Reed, Town of Bedford, also expressed support, but noted that he was concerned that there might be a duplication of effort as some municipalities, including Bedford, already have Pavement Management Systems. He suggested that staff find out which municipalities are already using a system. M. Pratt also suggested collecting the pavement management data that towns already have compiled.

To those points, E. Pagitsas noted challenges to compiling that data. MassDOT, MPOs, and RPAs have used different data collection methods and different software. Municipalities likely use different methods as well, ranging from simple visual methods to more sophisticated methods. It may be difficult to reconcile data from all those sources. Staff needs to research the existing data.

E. Bourassa inquired as to whether staff had access to data that compares pavement condition to safety. E. Pagitsas replied that staff does not have access to such data.

L. Dantas asked if there is any federal or state guidance on the role of the MPOs in collecting pavement management data. E. Pagitsas replied that the federal transportation agencies, in their UPWP approval letter, reported that they have a good sense of the pavement condition of MassDOT owned roads. Staff believes that FHWA and FTA want the MPOs to collect data on municipally-owned roads.

T. Kadzis expressed support for a pavement management system as an asset management tool but cautioned that there may not be federal funding to maintain it. He also noted that Pavement Management Systems do not address the functionality of roadways and he suggested that functionality be considered as part of the MPO's study. He also suggested limiting the study to focus the analysis on candidate projects in any given TIP cycle.

R. Reed recommended that the analysis provide a range of information to give an idea of the level of investment needed to produce certain roadway conditions, given that it might not be possible to fund improvements that bring roads to an "excellent" condition.

M. Pratt advised using lane miles, rather than centerline miles, for the analysis.

D. Mohler noted that the MPO needs to discuss its policy of not funding resurfacing projects.

L. Wiener asked if there are any other sources of funding for resurfacing projects. D. Mohler replied that the Interstate Maintenance and National Highway System line items in the State Transportation Improvement Program (STIP) fund resurfacing projects. Those sources do not fund resurfacing on municipally-owned roads.

R. Reed stated that there would be value in developing pavement management data for municipally-owned roads. This information could be used as an educational tool to highlight the need to invest in the roadway system. D. Mohler noted that the MassDOT Capital Investment Program highlighted a large annual gap in the ability of the state to fund resurfacing projects on state owned roads.

D. Mohler advised staff to go forward with preparing a work program with an assessment of the annual cost that would be required from the UPWP to start and maintain the program. Marie Rose, MassDOT Highway Division, invited MPO staff to consult with MassDOT's Pavement Management Section as they develop the work program.

10. FFYs 2012 – 2015 Transportation Improvement Program Update – *Hayes Morrison, TIP Manager, MPO Staff*
Members were provided with three handouts: a draft letter to municipal chief elected officials regarding the development of the FFYs 2012 – 2015 Transportation

Improvement Program (TIP), draft text for posting on the MPO's website, and proposed revisions to the TIP criteria. (See attached for all three handouts.)

H. Morrison gave a PowerPoint presentation discussing how staff has addressed members' questions about TIP outreach, project recommendations, and thresholds for project readiness and fiscal constraint. The presentation is summarized below. (See attached presentation.)

In this year's revised TIP process, the MPO will not be holding Municipal TIP Input Days, and instead, will be putting more emphasis on gathering project information from the Project Information Forms (PIFs) (which municipal project proponents will continue to fill out) and the corresponding evaluations. There is a webpage on the MPO's website where project proponents can view the project information and interact with their respective projects' database. Staff will discontinue the TIP How-To Seminars and instead hold TIP Building Workshops with updated and refocused content so that project proponents can learn about the new TIP process and can consult with the TIP Manager on TIP matters.

Staff made several recommendations. First, project readiness should be determined by the MassDOT Highway Division's Project Management Section. Second, the former Universe of Projects will become a smaller set of projects, the First Tier Projects, which will be those that rate well in the evaluation process and would be especially good candidates for future funding. The cut-off point for the First Tier list of projects would be an amount (combined project costs) that is twice the amount of federal funding available in the TIP annual element (approximately $120 million). And last, the TIP criteria would be updated to have six categories (some revised) aligned with the vision and policies of the Long Range Regional Transportation Plan. Projects would be evaluated based on a point system.

Members asked questions and made comments:

C. Stickney asked for definition of a "certified Green Community." (A project would receive recognition for being a certified Green Community under the Environmental and Climate Change category in the proposed TIP criteria.) H. Morrison replied that the Executive Office of Energy and Environmental Affairs (EOEEA) defines the term and certifies municipalities. C. Stickney expressed concern that the criterion might put certain municipalities at a disadvantage in the TIP process since municipalities that operate their own light departments may be ineligible for certain EOEEA certification programs. H. Morrison replied that all municipalities in the Commonwealth are eligible for the Green Community certification.

At members' request, H. Morrison explained the TIP criteria point system. Projects may score a range of points under each of the six TIP criteria categories, and those points are summed (rather than averaged, as in the past). This method allows for comparison across categories.

D. Koses expressed concern that there would be duplication of factors in the point system. H. Morrison noted that there were duplicate items in past TIP criteria as well. For example, projects could receive points for having bicycle and pedestrian accommodations under more than one category. D. Koses also noted that members should look at points scored in each category rather than the projects' total scores.

D. Koses also expressed concern that MassDOT's GreenDOT policies are not reflected in the TIP criteria. H. Morrison noted that they are included in the Environment and Climate Change category under the "air quality impacts" and "CO_2 reduction" items, among others.

M. Pratt stated that another item should be added to the Environment and Climate Change category to reflect impacts from polluted storm water run-off. H. Morrison and P. Wolfe noted that staff discussed adding such an item, but determined that storm water pollution issues are addressed by state and federal project permitting processes. All projects that have gone through the MassDOT project development process have had storm water issues addressed. Steve Olanoff, Regional Transportation Advisory Board, also expressed support for including a water quality item in the criteria since there may be projects that would be more beneficial in terms of improving water quality than others. Staff was asked to consider adding an item to account for possible benefits.

C. Stickney asked for more information about an item under the Safety and Security category that would evaluate projects based on whether they "improve the ability to respond to extreme conditions." H. Morrison noted that the item includes consideration for projects that improve facilities on evacuation routes, for example, and information the MPO has from a recent UPWP study. P. Wolfe added that information from that UPWP study will be available to the MPO for the TIP evaluation.

E. Bourassa requested that staff provide the questions behind the criteria categories to members. H. Morrison stated that staff will do so. Staff will also be revising the TIP handbook to reflect the new scoring information.

In response to members' requests, staff will provide them with information on the number of attendees at the TIP Building Seminars and upcoming MPO Open Houses, and staff will schedule the MPO's vote on the TIP in June (rather than in July, as previously proposed).

11. State Implementation Plan Update – *Stephen Woelfel, MassDOT*
MassDOT's monthly report on the State Implementation Plan was distributed to members.

S. Woelfel reported that MassDOT will be developing potential interim offset measures to compensate for schedule delays on the *Fairmount Line Improvement* project. CTPS will be asked to conduct modeling to determine the air quality benefits of those measures. He also reported on the schedule for the *Green Line Extension* project, which is scheduled to open in October, 2015.

T. Bent asked for an update on the decision about the location of the new Green Line maintenance facility. S. Woelful reported that MassDOT is proposing to site the facility at the location referred to as Option L. This is the location that is referenced in the draft Environmental Assessment for the project. He also noted that property owners from the Brickbottom area have filed a notice of intent to sue MassDOT, but negotiations between the parties are ongoing.

T. Bent also asked if the company M.S. Walker, which is located in the Brickbottom area, would be taken. S. Woelful explained that Pan Am, which provides freight service to the company, would have to stop operating on those tracks. He stated that MassDOT has been meeting with M.S. Walker. He does not believe MassDOT will be changing its recommendation at this time.

12. Members Items
There were none.

13. Adjourn
A motion to adjourn was made by M. Pratt, and seconded by Ginger Esty, Town of Framingham. The motion passed unanimously.

Transportation Planning and Programming Committee Meeting Attendance
Thursday, December 16, 2010, 10:30 AM

Member Agencies	Representatives and Alternates
MassDOT	David Mohler
MassDOT Highway	Marie Rose
	John Romano
City of Boston	Tom Kadzis
City of Newton	David Koses
City of Somerville	Tom Bent
Massachusetts Port Authority	Lourenço Dantas
MAPC	Eric Bourassa
MBTA	Benjamin Bloomenthal
MBTA Advisory Board	Paul Regan
Regional Transportation Advisory Council	Laura Wiener Steve Olanoff
Town of Bedford	Richard Reed
Town of Braintree	Christine Stickney
Town of Framingham	Ginger Esty
Town of Hopkinton	Mary Pratt

MPO Staff/CTPS
Seth Asante
Mike Callahan
Maureen Kelly
Robin Mannion
Anne McGahan
Liz Moore
Hayes Morrison
Efi Pagitsas
Sean Pfalzer
Karl Quackenbush
Arnie Soolman
Alicia Wilson
Pam Wolfe

Other Attendees

Micah Gensler	City of Newton
Sonia Hamel	Consultant
Tom O'Rourke	Neponset Valley Chamber of Commerce
Karen Pearson	MassDOT Office of Transportation Planning
Bryan Slack	MassDOT District 3
Stephen Woelful	MassDOT

BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

State Transportation Building
Ten Park Plaza, Suite 2150
Boston, MA 02116-3968
Tel. (617) 973-7100
Fax (617) 973-8855
TTY (617) 973-7089
www.bostonmpo.org

Jeffrey B. Mullan
MassDOT Secretary and CEO
and MPO Chairman

Arnold J. Soolman
Director, MPO Staff

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:

MassDOT Office of Planning and Programming
City of Boston
City of Newton
City of Somerville
Town of Bedford
Town of Braintree
Town of Framingham
Town of Hopkinton
Metropolitan Area Planning Council
Massachusetts Bay Transportation Authority Advisory Board
Massachusetts Bay Transportation Authority
MassDOT Highway Division
Massachusetts Port Authority
Regional Transportation Advisory Council (nonvoting)
Federal Highway Administration (nonvoting)
Federal Transit Administration (nonvoting)

MEMORANDUM

DATE December 2, 2010

TO Transportation Planning and Programming Committee of the Boston Region Metropolitan Planning Organization

FROM Karl Quackenbush and Mike Callahan

RE Posting Audio Files of TPPC Meetings on our Website

At a recent TPPC meeting, staff was asked to investigate the issues associated with posting audio files of TPPC meetings on the MPO website. This memorandum outlines what we found.

CURRENT BOSTON REGION MPO PRACTICE

We currently use a small digital audio device to record TPPC meetings. The device works well, is easy to use, and creates high-quality audio recordings that clearly record everyone in the room with minimal background noise. These files are available for anyone to hear, but their existence is not widely known, and an interested party has to request a particular audio file from us. We can then transfer the file to a CD and mail it to the person. We have only responded to one such request in recent years.

CURRENT PRACTICE AT OTHER PUBLIC ORGANIZATIONS

A quick web search revealed that posting audio files of meetings seems to be fairly widespread practice for city and county governments. Among other large MPOs, several are posting either audio or video files of their meetings. Those we have identified are shown in the table at the end of the memo.

ISSUES ASSOCIATED WITH OUR POSTING AUDIO FILES

Means of Making Files Available

An audio file can simply be posted on the website, and an interested party can download that file to her computer. Once it has been downloaded, she can then listen to it. Alternatively, the file can be made available on the website in a "streaming" format. This would allow the user to begin listening to the file immediately, would obviate the need to download, would therefore be more convenient for the user, and would not put as much strain on our system. For these reasons, this solution is preferable, but it would require our purchasing software for a few hundred dollars.

Storage Space for Files

Audio files are rather large. Currently, there is sufficient space for us to store several months' worth of them on the computer that sits outside of our firewall and is publicly accessible. Eventually, however, we would have to purchase additional computer storage space for the files.

File Embellishment/Recording Equipment

If we simply posted audio files without editing them, then our current recording equipment would suffice. A couple of MPOs annotate their audio files with references to who is speaking and insert bookmarks that delineate each agenda item. If we were to do those things as well, we would need to upgrade our recording equipment and purchase special editing software. Staff time would also be required to perform the editing.

Timeliness

Currently, it takes about two weeks after a TPPC meeting before the minutes appear on our website. Audio files could be posted to the website within hours of the meeting, therefore making the proceedings available right away, and without requiring an interested person to make a special request for the audio file.

Meetings Whose Audio Files Would be Posted

This practice could be confined to TPPC and MPO meetings, or it could be expanded to include RTAC and subcommittee meetings. Obviously, as the kinds of meetings covered by this practice increased, so too would the required computer storage space.

Editing and Context

Meeting minutes go through an editorial process, including TPPC review, to ensure clarity and accuracy. Raw audio files are, by definition, accurate, but they could sometimes suffer from lack of clarity in places. They would also be unaccompanied by the context that our other public outreach communications usually have. For those who follow the MPO's activities, this would not be an issue, but others might not fully comprehend what they are hearing on the audio files.

CONCLUSION

If so desired, staff could begin posting audio files of TPPC/MPO meetings quite soon and with minimal investment of time and money, under the assumption that no editing of the files would be performed. Given that meeting attendees identify themselves at the beginning of meetings, that members are usually called upon by name, and that presentation speakers are identified as well, staff believes that simply posting audio files "as is" could work well.

If there is a strong desire for these files to be embellished with annotation and bookmarking, then staff will have to conduct further investigations of required recording equipment and editing software, and staff time would have to be identified to perform the editing work on an ongoing basis.

A decision on whether or not to confine this practice to just TPPC/MPO meetings would have to be made.

TABLE 1
Use of Audio and Video Recordings of Meetings by Major MPOs

MPO	Audio	Video
Atlanta		
Baltimore		
Chicago		
Dallas	X	
Detroit	X	X
Minneapolis/St. Paul		X
New York City		X
Newark		X
Philadelphia		
San Diego	X	
San Francisco	X	
Washington, DC		

KHQ/khq

BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

State Transportation Building
Ten Park Plaza, Suite 2150
Boston, MA 02116-3968
Tel. (617) 973-7100
Fax (617) 973-8855
TTY (617) 973-7089
www.bostonmpo.org

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.

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[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

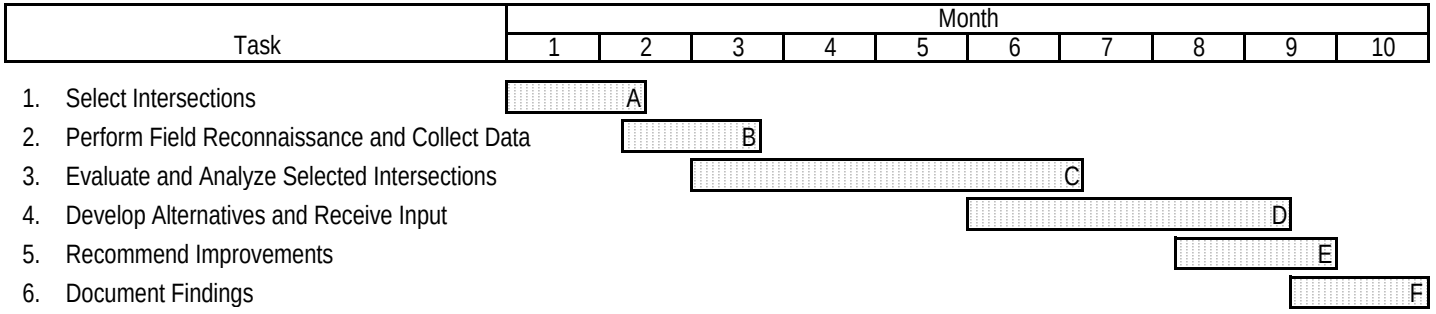
It is estimated that this project will be completed 10 months after the notice to proceed is received. The proposed schedule, by task, is shown in Exhibit 1.

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)

BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

State Transportation Building
Ten Park Plaza, Suite 2150
Boston, MA 02116-3968
Tel. (617) 973-7100
Fax (617) 973-8855
TTY (617) 973-7089
www.bostonmpo.org

Jeffrey B. Mullan
MassDOT Secretary and CEO
and MPO Chairman

Arnold J. Soolman
Director, MPO Staff

Draft

MEMORANDUM

DATE: **December 16, 2010**

TO: **Transportation Planning and Programming Committee**

FROM: **Efi Pagitsas and Seth Asante**

RE **Federal-Aid-Eligible Boston Region MPO Roads: A Rough Estimate of Maintenance Costs for FFYs 2010–2014 and Recommendations on the Development of a Pavement Management System (PMS)**

STUDY PURPOSE AND SUMMARY OF FINDINGS

The purpose of this study is threefold:

- To develop a sense of the magnitude of the costs required to maintain the Boston Region MPO's Federal-Aid (FA) local roads
- To define and describe the principles of a pavement management system (PMS)
- To bring to the TPPC's attention the next steps in beginning to explore the development of a pavement management system that would facilitate informed decision making regarding pavement investment strategies

The study's conclusions may be summarized as follows:

- A PMS provides extremely important input for investment strategy decisions.
- The MPO should consider maintaining such a system in order to:
  - Estimate accurately the maintenance costs for FA-eligible roads in the region
  - Help develop and choose from maintenance strategies for the effective use of increasingly limited resources
  - Reduce the number of Transportation Improvement Program (TIP) "Reconstruction" projects that include a very costly deep pavement-reconstruction component
- In preparation for a possible PMS for the MPO region, the staff seeks authorization to begin planning for the development of such a system. The planning work this would include is specified in the final section of this memo.

INTRODUCTION

In their October 2009 communication to the MPOs regarding the approval of the Massachusetts FFY 2010 Unified Planning Work Program (UPWP),[1] the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) recommended that "…the RPAs undertake a study to establish the cost of maintaining the roadway systems in the cities and towns that make up their regions. The interstate and the National Highway System arterials in each region have their own dedicated federal funding source and are largely the responsibility of Massachusetts Department of Transportation Highway Division. The remaining miles of arterials as well as the urban collectors in the regions are the responsibility of the cities and towns working in cooperation with the MPOs. As such, the MPOs need to know the cost of maintaining these roadways, and more importantly, need to ensure that priority is given to their maintenance. Many of the MPOs do not have a good handle on matters pertaining to the maintenance of roadways, and therefore it is necessary that priority be given to undertaking these studies. It is the expectation that the results of these studies will be used to inform MPO decision-making in the next major update of the Regional Transportation Plans to begin in FY 2010."

This memorandum essentially presents the analysis from and results of the study that the FHWA and the FTA recommended above and discusses issues related to the development of a Boston Region MPO PMS so that, in the future, analysis can be done more accurately and pavement maintenance priority decisions can be made explicitly.

2010 MARPA PAVEMENT MANAGEMENT/MAINTENANCE SUBCOMMITTEE

In response to the FHWA and FTA recommendation, the Massachusetts Association of Regional Planning Agencies (MARPA) and the Massachusetts Department of Transportation (MassDOT) Office of Transportation Planning formed the Pavement Management/Maintenance Subcommittee, which included representatives from most of the 13 RPAs in Massachusetts. The subcommittee's goal was to assist those RPAs that do not maintain a PMS with determining the cost of maintaining the FA-eligible local-roadway system and to ensure that priority is given to the maintenance of that system.

The subcommittee met several times in the spring and summer of 2010. The discussion topics, which were recommended by the subcommittee chairperson, Charles Kilmer, OCPC, were specified by him as follows:

- "Existing methods and priorities of measuring pavement condition, maintenance, and level of investment
- Current pavement management practices
- Results and usage of existing PMSs, and what are the conditions and costs of maintaining the system
- Potential for prioritizing repairs by roadway type, and identifying funding sources

[1] FHWA and FTA letter to EOT Secretary James A. Aloisi, Jr., October 1, 2009, regarding "Approval of the Massachusetts FY 2010 Unified Planning Work Programs."

- Opportunities for consistent methodologies, repair strategies, pavement management software, etc."

The main findings from the subcommittee meetings were:

- Of the 13 RPAs in Massachusetts, the following 7 have a PMS to assist them with identifying and prioritizing pavement maintenance needs in their region:[2]
    - Central Massachusetts Regional Planning Commission (CMRPC)
    - Montachusett Regional Planning Commission (MRPC)
    - Merrimack Valley Planning Commission (MVPC)
    - Nantucket Planning and Economic Development Commission (NP&EDC)
    - Old Colony Planning Council (OCPC)
    - Pioneer Valley Planning Commission (PVPC)
    - Southeastern Regional Planning and Economic Development District (SRPEDD)
- The RPAs that have a PMS collect data on a two-to-five-year cycle at a cost of $10,000 to $45,000 annually, and apply a variety of PMS software to process and analyze the collected data.
- In 1986, the Metropolitan Area Planning Council (MAPC) developed a Pavement Management Program[3] manual to assist the region's 101 cities and towns in the development of their own PMSs. In addition to the published manual, MAPC employed one staff person to manage the program, which focused on technical assistance to the region's cities and towns. The MAPC program was discontinued in the early to mid-1990s. Presently, although every city and town's public works director in the Boston Region MPO area makes pavement management priority decisions annually, it is unclear what kind of pavement management system each municipality relies on.
- For the MAPC/Boston Region MPO area and the rest of the RPAs that do not maintain pavement management systems, it is possible to employ sketch-planning-level methods and generic data from MassDOT and RPAs that maintain a PMS to make initial approximate calculations of the amount of funding required to maintain each region's FA-eligible roads to a target level.
- In order to determine pavement management priorities and more accurately calculate maintenance cost for FA-eligible roads, RPAs that do not have a PMS should consider developing one. A PMS would allow for the analysis of investment strategies that most effectively match available funding.

Other information and findings from subcommittee meetings include the following:

- There are 3,463 FA centerline miles in the Boston Region MPO area, of which 694 (20%) are MassDOT-maintained and 2,768 (80%) are municipality-maintained.[4]

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[2] The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) required states and MPOs to implement management systems, including a pavement management system. This requirement was modified in the FHWA and FTA 1996 Final Rule on Management and Monitoring Systems encouraging states and MPOs to selectively implement, rather than mandating that they implement, management systems, including a pavement management system, with the exception of the Congestion Management System (CMS).

[3] *Pavement Management: A Manual for Communities,* Metropolitan Area Planning Council, 1986.

[4] MassDOT Pavement Management System.

- For the rest of the planning regions in the commonwealth, the total centerline miles of municipally owned FA roads range from 253 to 1,002 miles.
- MassDOT has pavement condition data for a sample of 936 (34%) of the 2,768 centerline miles that are owned and maintained by cities and towns in the Boston Region MPO area. (Because these segments are between segments of MassDOT-maintained roadways, data on the former are captured during collection of data on the latter by MassDOT pavement management staff for MassDOT's PMS.) According to MassDOT, the pavement condition of the 936 sample centerline miles is as follows:[5]
    - 57 centerline miles (6%) excellent
    - 275 (29%) good
    - 284 (30%) fair
    - 319 (34%) poor
- Extrapolating from the MassDOT sample data in order to assess the pavement condition of all city- and town-owned FA roads in the commonwealth, the centerline miles are distributed as follows:
    - 12% excellent
    - 36% good
    - 28% fair
    - 24% poor
- Pavement condition distributions of FA-eligible local roads derived from MassDOT-collected data differ significantly from the distributions derived from data collected by the RPAs.
- The consensus was that RPAs with established PMSs should adopt pavement condition distributions derived from their PMS databases, while RPAs without PMS programs should consider using the condition distribution from the MassDOT sample or a weighted average based on neighboring RPAs.

WHAT IS A PAVEMENT MANAGEMENT SYSTEM (PMS)?

The condition of roads in a region is an important factor in the planning process, because roads are the foundation of any regional transportation system. Consequently, PMS strategies are needed as part of the planning process in order to inform the Long-Range Transportation Plan's (LRTP's) and the TIP's allocations of resources to long-term and short-term roadway projects. Effective fund allocation is especially important at times when funding is scarce and decision makers are looking to maximize the benefit of every dollar spent.

A PMS is a set of tools, methods, and processes to assist in overseeing the maintenance of a roadway network. Specifically, a PMS can assist decision makers in finding cost-effective

[5] It is unclear whether the pavement condition distribution based on MassDOT's sample of local FA roads in the MAPC/Boston Region MPO area is accurate for the area's local FA roads overall. This is mainly because MassDOT's rating system for pavement conditions adheres to a higher standard than that for local roads. In the rough analysis presented later in this memo, staff decided to adopt a weighted average distribution of existing conditions based on the two neighboring RPAs, CMRPC and OCPC, as being more representative of the condition of the Boston Region MPO's local FA roads.

strategies for monitoring and evaluating road pavement and maintaining it in a state of good repair. A PMS system comprises two components:

- A detailed database that describes historical pavement condition, traffic levels, and pavement structure for predefined roadway segments. Most PMSs collect pavement condition information via a "windshield" or "photologging" survey of pavement roughness and distress. (MassDOT does this with an Automatic Road Analyzer, or ARAN.) The combined overall road pavement condition of a segment is assigned a rating from a road rating system. For example, MassDOT uses the PSI (Pavement Serviceability Index) rating system, which assigns values from 0.00 to 5.00 or the ratings "poor," "fair," "good," and "excellent." MassDOT's target pavement value is "excellent" for both interstate and non-interstate roads, but the associated PSI targets differ slightly: 4.0 for interstate roads and 3.5 for non-interstate roads.[6]
- The second component of a PMS consists of a set of tools or models that determine existing and future pavement conditions and funding needs, and point to priority pavement-preservation projects. This is done through timelines that are built into the models to estimate at what pace the roadway will deteriorate. For example, for MassDOT's FFY 2011–2015 Highway Capital Investment Plan (CIP), MassDOT pavement management staff applied associated models for pavement deterioration to estimate the cost of maintaining interstate and non-interstate roads in "excellent" condition. According to MassDOT's CIP, it would require $128 million annually to achieve the targeted PSI for interstate highways and $185 million annually to achieve the targeted PSI for non-interstate roads.

A very important question PMS models can analyze is, Which roads should be maintained at a predefined target level, given the amount of funding available for a sequence of forecast years? To reach a conclusion, the PMS tool allows MPOs and state DOTs to define and "run" several "what if" scenarios to find the applicable optimum one.

ESTIMATING MAINTENANCE COSTS FOR FEDERAL-AID-ELIGIBLE LOCAL ROADS IN THE BOSTON REGION MPO AREA

In order to begin developing a sense of the order of magnitude of pavement management costs for local roads in the region, staff selected the approach of answering the question, What would be the approximate cost of bringing to "excellent" condition the 2,768 centerline miles that are the responsibility of MPO communities? Note that, chances are, the preferred policy of the municipalities and the MPO would be one that defines different mixes of roadway types and target condition levels to implement annually. This is because the general theory and practice in asset management systems dictates that the least costly strategy is to exercise sufficient maintenance in order to prevent further deterioration of roads in "good" and "fair" condition as opposed to upgrading those which are in "poor" condition first. Therefore, analyzing the cost of bringing all 2,768 miles to "excellent" condition would yield an upper-bound estimate of maintenance cost.

[6] Draft FFY 2011–2015 Highway Capital Investment Plan, MassDOT, Office of Transportation Planning, May 2010.

Staff used two different methods to estimate the annual cost of bringing all FA-eligible local roads in the Boston Region MPO area to "excellent" pavement condition over the course of FFYs 2010–2014:

Method 1: Applying Weighted Average Pavement Conditions and Average Pavement Repair Cost per Centerline Mile from Neighboring RPAs' Data

Staff calculated the annual maintenance cost for FFYs 2010 to 2014 by making assumptions based on neighboring RPAs' pavement condition and cost data. The method applied was based on a modified sketch-planning tool[7] presented at one of the MARPA pavement management subcommittee meetings. The following assumptions and calculations were made:

- All cost calculations are for bringing pavement condition to "excellent."
- The weighted average existing pavement condition distribution of OCPC and CMRPC was assumed as this region's pavement condition distribution: 20% excellent, 29% good, 25% fair, and 26% poor.[8]
- The total cost for all the FA-eligible local roads in the Boston Region MPO area was calculated by applying the weighted average cost per centerline mile ($306,746, the weighted average for the two neighboring RPAs) to the total FA local miles in our area, 2,768 miles, which yields $849,072,928. See Table 1A.
- Reflecting the assumption of a five-year maintenance cycle, the total cost was distributed over five years, yielding $169,814,586 annually. See Table 1B.

In summary, this analysis points to a $169.8 million annual cost over five years to bring all FA-eligible local roads in the Boston Region MPO area to "excellent" pavement condition.[9]

Method 2: Applying Weighted Average Pavement Conditions from Neighboring-RPA Data and Average Pavement Repair Cost per Lane-Mile from Compatible MPOs' Data

In this method, staff calculated the annual maintenance cost for FFYs 2010–2014 by making the same assumptions about the distribution of pavement condition as those made in Method 1, but estimating cost per lane-mile[10] based on compatible MPOs' data and taking into account the varying types of maintenance required. First the distribution of pavement condition (excellent,

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[7] Charlie Kilmer, Old Colony Planning Council, 2010

[8] Staff applied the weighted average of actual existing pavement condition data from CMRPC and OCPC because they are neighboring MPOs, they have established PMS systems, and their travel and land use characteristics are similar to those of the Boston Region MPO area. The rest of the MPOs that maintain PMSs are more rural, and their roads would be expected to exhibit different deterioration characteristics. Note that the existing pavement condition distribution for the entire state, as estimated from the MassDOT sample, is 12% excellent, 36% good, 28% fair, and 24% poor. The MassDOT sample distribution for the Boston Region MPO area is 6% excellent, 29% good, 30% fair, and 34% poor. This distribution was not used in the present analysis because it appears to reflect mostly higher-classification roads, which MassDOT maintains at a higher pavement condition standard. The distribution that was used is not likely, of course, to match the region's actual distribution exactly.

[9] The cost would of course be lower if the target pavement condition were lower than "excellent"—say, "good"—or if the existing pavement condition distribution assumed for the region had a higher proportion of roads in "excellent" condition.

[10] While centerline miles are used in Method 1, lane-miles are used in Method 2 because input data are in lane-miles.

Table 1A
Federal-Aid (FA) Local Road Maintenance Costs
(to bring all roadways to "excellent" condition)
as Estimated by Method 1,
Boston Region MPO, FFYs 2010-2014

Centerline Miles	Weighted Average Cost per Mile	Total Cost	Annual Cost
2,768	$306,746	$849,072,9284	$169,814,586

Table 1B
Annual Federal-Aid (FA) Local Road Maintenance Costs
(to bring all roadways to "excellent" condition)
as Estimated by Method 1,
Boston Region MPO, FFYs 2010-2014

	FFY 2010	FFY 2011	FFY 2012	FYY 2013	FFY 2014
Required funding	$169,814,586	$169,814,586	$169,814,586	$169,814,586	$169,814,586

good, fair, or poor) was estimated for FA-eligible local roads in the Boston Region MPO area from the weighted average of OCPC and CMRPC pavement condition data.

To determine the total cost of repairs, staff applied estimates of per-lane-mile costs by type of repair (preventative maintenance for pavement in good condition, rehabilitation for pavement in fair condition, and reconstruction for pavement in poor condition) to the corresponding number of miles in each type of condition. As reliable information on cost by type of repair was not available for Massachusetts, staff applied corresponding data from the Southeastern Michigan Council of Governments (SEMCOG), which appears to employ a well-established PMS. Tables 2A and 2B show the results of this estimation approach, which points to a cost of approximately $1.6 billion, or $324 million annually for FFYs 2010–2014, to bring FA local roads in the Boston Region MPO area to "excellent" pavement condition.

SUMMARY AND NEXT STEPS

The Boston Region MPO does not presently maintain a PMS. Consequently, it is impossible to estimate reliably the cost of maintaining the region's FA local roads. The following information essential to traditional pavement management analysis is unavailable:

- Accurate knowledge of existing pavement conditions
- A forecasting tool that, based on existing conditions, is able to evaluate investment strategies
- A policy that details how to maintain these roadways (target condition levels)

Table 2A
Federal-Aid (FA) Local Road Maintenance Costs by Current Pavement Condition
(to bring all roadways to "excellent" condition)
as Estimated by Method 2,
Boston Region MPO, FFYs 2010-2014

Current Pavement Condition	PSI Range	% of Region's Lane-Miles	Number of Lane-Miles	Type of Maintenance Required	Generic Cost per Lane-Mile[11]	Total Cost	Annual Cost
Excellent	3.50 - 5.00	20%	1,169	None	0	0	--
Good	2.80 - 3.49	29%	1,637	Preventive	$32,525	$55,140,934	--
Fair	2.30 - 2.79	25%	1,462	Rehabilitation	$239,500	$350,029,250	--
Poor	0.00 - 2.29	26%	1,520	Reconstruction	$798,500	$1,213,688,060	--
Total			5,846			$1,618,858,244	$323,771,649

Table 2B
Annual Federal-Aid (FA) Local Road Maintenance Costs
(to bring all roadways to "excellent" condition)
as Estimated by Method 2,
Boston Region MPO, FFYs 2010-2014

	FFY 2010	FFY 2011	FFY 2012	FYY 2013	FFY 2014
Required funding	$323,771,649	$323,771,649	$323,771,649	$323,771,649	$323,771,649

Furthermore, in order to determine costs in a "targeted" manner, one must be able to identify the investment strategies that are most effective for this region's existing pavement conditions, funding levels, and desired maintenance level. However, it is unrealistic to do this without actual data from a PMS and software which, applying the data, model alternative investment strategies and corresponding costs.

From this study, staff concluded the following:

- A PMS is extremely important for investment strategy decisions
- The MPO should consider maintaining such a system in order to:
    - Estimate accurately maintenance costs for FA-eligible local roads in this region

[11] Southeastern Michigan Council of Governments, Transportation Investment Prioritization Process, Cambridge Systematics, Inc., June 30, 2009.

  - Help develop and choose from maintenance strategies for the effective use of increasingly limited resources
  - Reduce the number of TIP "Reconstruction" projects that include a very costly deep pavement-reconstruction component
- To this end, staff seeks concurrence from the TPPC to begin planning for the development of a PMS, including:
  - Leading a discussion at the TPPC level regarding the current practice of not using "target" funding for resurfacing projects
  - Exploring pavement management policies, with associated funding, that would promote effective investments in pavement maintenance and would be included in the 2035 LRTP
  - Defining how an MPO-maintained PMS would relate to the PMSs of municipalities in the region
  - Identifying the UPWP funding commitment required to develop and maintain a PMS

EP/SAA/ep/saa

Pavement Management System (PMS)

Cost Estimates and Recommendations on Development of a PMS

December 16, 2010

Seth Asante and Efi Pagitsas

Boston Region Metropolitan Planning Organization

Study Purpose

- Estimate maintenance costs for Federal Aid-eligible Boston Region MPO roads
- Define basic principles of a PMS
- Inform the TPPC on next steps in developing a PMS
- Seek authorization from the TPPC to begin planning for the development of a PMS

MPO Federal Aid-Eligible Roads

There are 3,463 centerline miles in the Boston Region MPO

- 694 centerline miles are MassDOT-maintained.
- 2,768 centerline miles are municipality-maintained.

2010 MARPA PMS Subcommittee

- Assist MPO that do not have a PMS with developing maintenance costs
- Explore current pavement management practices, including repair priorities and costs
- Explore opportunities for consistent methodologies and software

What Is a PMS?

- A PMS is a set of tools, methods, and processes to assist in overseeing the maintenance of a roadway network.
- A PMS can assist decision makers in finding cost-effective strategies for monitoring and evaluating road pavement and maintaining it in a state of good repair.

Cost Estimates for a Five-Year Cycle

- Cost estimates to bring roads to "Excellent" condition
- Assumed existing conditions: 20% "Excellent," 29% "Good," 25% "Fair," and 26% "Poor"
- Weighted average costs per centerline mile
- Estimates of costs per lane-mile by repair type
- Annual maintenance cost FFY 2010-FFY 2014: $169.8M to $323.7M

Conclusions

A PMS is very important tool for:

- Developing and choosing maintenance strategies
- Estimating maintenance costs accurately
- Reducing number of costly "deep reconstruction" projects

Recommendations

Staff seeks TPPC concurrence to:

- Begin planning for a PMS
- Lead discussions of present policy regarding use of "target" funding for non-resurfacing projects
- Explore PMS policies and funding to promote effective pavement investments
- Define how the MPO PMS would relate to PMS work done by municipalities
- Identify the required UPWP funding commitment

BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

State Transportation Building
Ten Park Plaza, Suite 2150
Boston, MA 02116-3968
Tel. (617) 973-7100
Fax (617) 973-8855
TTY (617) 973-7089
www.bostonmpo.org

Jeffrey B. Mullan
MassDOT Secretary and CEO
and MPO Chairman

Arnold J. Soolman
Director, MPO Staff

January 10, 2011

«First_Name»«Last_Name»
«Position»
«Organization»
«Address1»
«Address_City_Town», «State»«Zip_Code»

Re: FFYs 2012–15 Transportation Improvement Program Development

Dear «FIRST» «LAST»:

The Boston Region Metropolitan Planning Organization (MPO) is beginning the process of developing the federal fiscal years (FFYs) 2012–15 Transportation Improvement Program (TIP). This year the MPO is changing its approach to collecting information and to the development of the TIP in consideration of the fiscal picture regarding available federal funds for transportation. The MPO will not be hosting Municipal TIP Input Days this year.

This lack of available funds will limit the number of projects the MPO can reasonably expect to fund in a four-year period. In order to insure that the projects and programs selected for funding are the most consistent with the MPO's visions and policies, the MPO will place emphasis on the Project Information Forms (PIFs) and their corresponding evaluations for project prioritization and selection.

These evaluations will be the basis for development of the FFYs 2012–15 TIP. Projects that evaluate highest and can be made ready for project advertisement in a given federal fiscal year will be developed into a staff recommendation for the FFYs 2012–15 TIP and presented to the MPO. Staff will also provide a first-tier list of projects (those projects that evaluate highly, but may not meet fiscal constraint or immediate readiness factors) for future consideration and/or to be programmed in the event that any project listed cannot be obligated. The staff recommendations and the list of first-tier projects will be presented and discussed in an open forum. Municipalities will be notified in advance and will be welcome to participate.

In order to make sure the MPO and its staff are receiving accurate and timely information regarding your project(s) and to discuss any questions you may have, the MPO will host **TIP Building Workshops on February 16, 22, and 23**. We strongly encourage all municipalities to attend at least one of these workshops.

Please visit the MPO website at www.bostonmpo.org/??? for more information regarding these adjustments to the MPO's TIP development process.

If you have any questions, please contact Hayes Morrison at hayesm@bostonmpo.org or 617-973-7129.

Sincerely,

David J. Mohler, Chair
Transportation Planning and Programming Committee

Information for TIP Contacts

This page presents information for TIP contacts on important changes in the development process for the federal fiscal years (FFYs) 2012–15 Transportation Improvement Program.

A Revised Process for TIP Development

The Boston Region Metropolitan Planning Organization (MPO) has begun to develop the federal FFYs 2012–15 Transportation Improvement Program (TIP). This year the MPO is modifying the way it gathers information for the development of the TIP. Considering the fiscal picture regarding available federal funds for transportation, the MPO will not be hosting Municipal TIP Input Days this year.

Information Gathering through Project Information Forms (PIFs) and Project Evaluations

A decrease in available funds will limit the number of projects the MPO can reasonably expect to fund in a four-year period. In order to insure that the projects and programs most consistent with the MPO's visions and policies are selected for funding, the MPO will place emphasis on the Project Information Forms (PIFs) and their corresponding evaluations for project selection. These evaluations will be the basis for development of the FFYs 2012–15 TIP.

Staff Recommendation and First-Tier List of Projects

Projects that are evaluated and given the highest scores and that can also be made ready for project advertisement in a given federal fiscal year will be developed into a staff recommendation for the FFYs 2012–15 TIP and presented to the MPO. Staff will also provide a list of first-tier projects (those projects that earn a high score based on the evaluation criteria, but that might not meet fiscal-constraint standards or immediate-readiness factors) for either future consideration and/or to be programmed in the event that a project that is listed cannot be ready for advertisement during the FFYs 2012-15 TIP time frame. .

TIP-Building Workshops

In order to make sure the MPO and MPO staff are receiving accurate and timely information regarding projects and to discuss any questions from project proponents, the MPO will host **TIP-Building Workshops on February16, 22, and 23**. For more detailed information on the locations and times of the workshops, please view the FFYs 2012–15 TIP Development Calendar **[hyperlink].** The MPO strongly encourages all municipalities to attend at least one of these workshops.

Important Information for Municipalities to Update

All municipalities are strongly encouraged to update the following information:

1) *Project Information Forms (PIFs* – Proponents can update their proponent-provided information and view their project information forms (PIFs) online. Please **click here** to start updating this information.
2) *List of projects for which your municipality intends to seek federal funding.* Municipalities will find a list of the known projects in each municipality online at

http://www.bostonmpo.org/bostonmpo/TIP_development.html. To submit information on these projects, click here. If a project is not listed online, please check the "Other" box and fill out the requested information.

3) *TIP Contact.* Your municipal TIP Contact is listed **here**. To list a new contact, please click **here**.

Discussions with the MPO

The staff's recommendation and list of first-tier projects will be presented to the MPO and discussed at a public meeting. Project proponents will be notified in advance of the staff recommendation, the first-tier list of projects, and the date and time of the presentation and discussion. Please view the FFYs 2012–15 TIP Development Calendar for more information.

ID	Municipality	Project Name	Community Priority	Subregional Priority	Transportation Plan	Maintenance, Modernization and Efficiency							Livability and Economic Benefit							Mobility							Environment and Climate Change							Environmental Justice				Safety and Security										**129 TOTAL POINTS POSSIBLE:**
						Rating (18 Total Points Possible):							**Rating (28 Total Points Possible):**							**Rating (22 Total Points Possible):**							**Rating (22 Total Points Possible):**							**Rating (10 Total Points Possible):**				**Rating (29 Total Points Possible):**										
						Improves substandard pavement	Improves substandard signal equipment condition	Improves traffic signal operations	In a Congestion Management Process identified area	Provides intermodal accommodations/connections to transit	Implements ITS strategies other than traffic signal operations	**TOTAL CATEGORY POINTS (up to 18)**	Design is consistent with complete streets policies	Provides multimodal access to an activity center	Reduces auto dependency	Project serves a targeted redevelopment site	Provides for development consistent with the goals of MetroFuture	Improves the Quality of Life	**TOTAL CATEGORY POINTS (up to 28)**	Existing peak hour Level of Service (LOS)	Improves an MPO or State identified freight movement issue	Improves proponent identified primary mobility issue	Improves MPO identified mobility issue	Project reduces congestion	Improves transit reliability	**TOTAL CATEGORY POINTS (up to 22)**	Project serves a targeted redevelopment site	Air quality impacts	CO2 reduction	Project is in an EOEEA certified Green Community	Project within municipally(s) that are ICLEI members	Project reduces VMT/VHT	**TOTAL CATEGORY POINTS (up to 22)**	Improves transit for an EJ population	Design is consistent with complete streets policies in an EJ area	Improves an MPO identified EJ transportation issue	**TOTAL CATEGORY POINTS (up to 10)**	Improves emergency response	Improves ability to respond to extreme conditions	EPDO/Injury Value Using the Commonwealth's listing for EPDO or Injury Value information	Improves proponent identified primary safety need	Improves MPO identified primary safety issue	Improves freight related safety issue	Improves bicycle safety	Improves pedestrian safety	Improves safety or removes an at grade railroad crossing	**TOTAL CATEGORY POINTS (up to 29)**	**TOTAL POINTS (up to 129)**
												0							**0**							**0**							**0**				**0**										**0**	**0**
												0							**0**							**0**							**0**				**0**										**0**	**0**
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												0							**0**							**0**							**0**				**0**										**0**	**0**
						36 total questions						**0**							**0**							**0**							**0**				**0**										**0**	**0**

FFYs 2012-15 TIP Development

Hayes Morrison, TIP Manager

December 16, 2010

Transportation Planning and Programming Committee Presentation

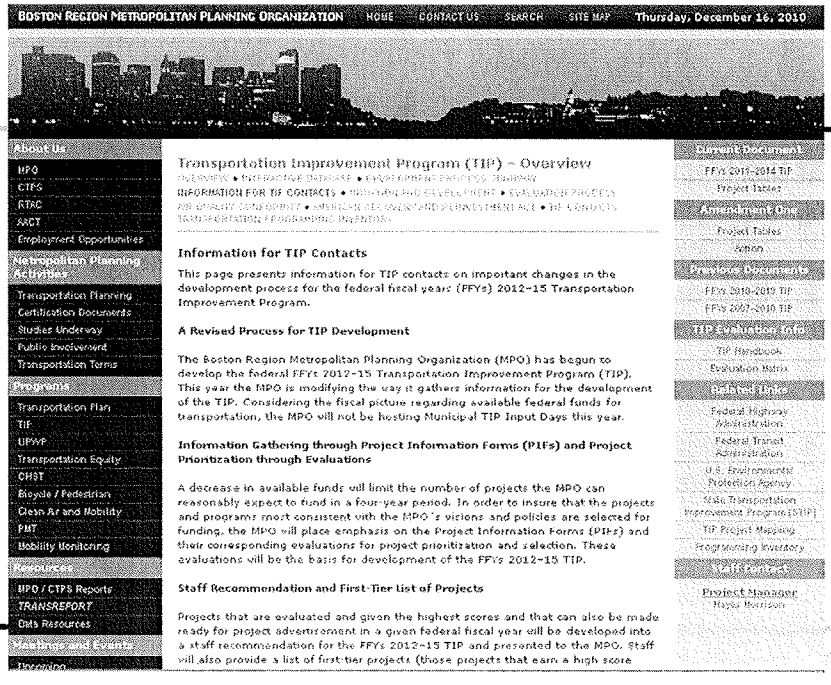
Boston Region Metropolitan Planning Organization

FFYs 2012-15 TIP Development

- At the December 2, 2010 meeting, MPO staff was asked to:
  1. Provide documentation for outreach to Chief Elected Officials, TIP Contacts and the public.
  2. Provide documentation regarding how staff will form the staff recommendation and first tier of projects.
  3. Provide a recommendation regarding readiness thresholds for the staff recommendation and first tier of projects.
  4. Provide a recommendation for policy(s) regarding the fiscal constraint of the first tier of projects.

Provide documentation for outreach to Chief Elected Officials, TIP Contacts and the public

- Staff has drafted a letter for Chief Elected Officials
- Staff has drafted a webpage with instruction for TIP contacts and more information



Provide documentation regarding how staff will form the staff recommendation and first tier of projects

Readiness Threshold:

- Consultation on readiness will be with the implementing agency (MassDOT – Highway Division) and will vary given the year and complexity of the project.

Frist Tier of Projects Fiscal Constraint:

- There will be approximately $120M worth of projects (two years of TIP Target Funding) in the First Tier of Projects.

Provide documentation regarding how staff will form the staff recommendation and first tier of projects

Project Prioritization Factors:

- Evaluation against the TIP Criteria. The TIP criteria and the corresponding evaluations are reflective of the visions and policies adopted by the Boston Region Metropolitan Planning Organization (MPO) on April 22, 2010.
- Readiness factors (to include all permitting). Deference will be given to MassDOT – Highway Division staff on this factor.
- Long Range Transportation Plan (Paths to a Sustainable Region – 2035) implementation.
- Geographic Equity.