MEMORANDUM

DATE **January 21, 2010**

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

FROM **Arnold J. Soolman, CTPS Director**

RE **Work Program for: Congestion Management Process (CMP) – February 2010, to September 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 Congestion Management Process (CMP) – February 2010, to September 2011, in the form of the draft dated January 21, 2010.

PROJECT IDENTIFICATION

Unified Planning Work Program Classification
Planning Studies

CTPS Project Number
11138

Client(s)
Boston Region Metropolitan Planning Organization

CTPS Project Supervisors
Principal: Efi Pagitsas
Manager: Eric Howard

Funding
3C PL Transportation Planning Contract #59796

IMPACT ON MPO WORK

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

BACKGROUND

The MPO originally began the Congestion Management Process (CMP)[1] in 1995. As a result of CMP monitoring, numerous studies have been prioritized and included for detailed study in the Unified Planning Work Program (UPWP) and many have been included in the Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP) for construction funding. CMP products can be reviewed in the Boston Region MPO website, www.bostonmpo.org, under Mobility Monitoring and under Resources, MPO Reports. A small sampling of current and recent studies and other products includes:

- Route 60 Mobility Study
- Route 126 Corridor Study
- Improving Pedestrian and Bicycle Access to Selected Transit Stations
- Bicycle Parking Need at MBTA Transit and Commuter Rail Stations
- Arterial and Freeway Average Travel Speed Maps
- Lists of Most Congested Intersections
- MBTA and MassDOT Parking Lot Monitoring
- Lower North Shore Transportation Study
- HOV Monitoring
- Freeway Speed and Travel Time Monitoring

The CMP is a federally required[2] program for this MPO and one that benefits the planning process in the region. *Its purpose is to apply a systematic, performance-driven approach to the region to identify congestion and its causes, propose mitigation strategies, and evaluate the effectiveness of implemented strategies.* In addition, the CMP's "performance-driven" approach is consistent with the initiative of MassDOT's Office of Performance Management and Innovation to improve agency performance by setting goals and measuring progress.[3]

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[1] The CMP is the continuation of the program formerly referred to as the Mobility Management System (MMS) and, before that, as the Congestion Management System (CMS). The current name is consistent with the increased emphasis in SAFETEA-LU and subsequent federal regulations and guidances on addressing congestion "through a process that provides for effective management and operations, and an enhanced linkage to the planning process and to the environmental review process, based on cooperatively developed travel demand reduction and operational management strategies as well as capacity increases" (SAFETEA-LU).

[2] A CMP is required in Transportation Management Areas (TMAs), defined as urban areas with a population over 200,000.

[3] MassDOT Office of Performance Management and Innovation, A Vision for 2010: Performance Management at MassDOT, January 12, 2010; MassDOT Score Card, Secretary Mullan's Message, December 2009.

The CMP is not viewed by federal regulation as a stand-alone process, but as an integral part of the metropolitan transportation planning process. At its core, the CMP identifies congested and mobility-deficient locations and services and recommends projects and strategies to be included in the LRTP and funded for implementation in the TIP. Also, based on monitoring and the identification of congested locations, the CMP recommends appropriate studies and prioritizes them for funding in the UPWP.

The CMP is one of the primary avenues for planning for management and operations (M&O)strategies. These generally include non-capital-intensive solutions that typically require no right-of-way takings and usually include incident management, traffic signal management, HOV lanes, transit signal priority, dedicated bus lanes, and other types of improvements.

Federal regulation requires the implementation of such strategies and the public also seems to favor them. For example, several of the 10 core themes from the public workshops of MassDOT's youMove Massachusetts public engagement process are focused, respectively, on reliability,[4] system management and preservation,[5] efficiency,[6] choices,[7] and technology.[8] These emerging themes indicate that the public places a high priority on reliability of transit service, provision of accurate information for making choices in travel modes and routes, coordination of traffic signals, identification and redesign of crash-prone locations, and effective use of technology to optimize system performance across the region's modes and services. Also, with respect to natural disasters and homeland security, efficient emergency response and evacuation are critical, and they rely on good communication technology, efficient agency coordination, and cooperative management[9] and operations.

In addition, it is estimated that over half of congestion experienced by travelers is caused by nonrecurring events.[10] These are not typically taken into account in the development of a traditional regional transportation plan. Planning for operations through the CMP, a strategic and informed approach, is a new way to address these types of congestion problems. This approach ensures that the LRTP is not exclusively a "project-focused" document but also addresses short- and medium-range issues usually associated with transportation

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[4] "Theme 1: You want a more reliable transportation system where the delays are minimized and travel times are consistent."
[5] "Theme 2: Our transportation assets need to be managed to extend their useful life and thereby maximize the benefits of our past investments."
[6] "Theme 3: Transportation facilities and operations should be better informed by real-world conditions faced by system users."
[7] "Theme 4: With so many users competing for space, we must find better ways to share our roadways, through engineering, education, and enforcement."
[8] "Theme 6: Consumers want a more user-friendy transportation systen, where information is easier to access and the travel experience is more comfortable and welcoming."
[9] Note that "management" implies a systematic approach to optimize the efficiency of a service, program, or operation. It differs from "maintenance," which refers to keeping a facility in good working condition (as in, for example, foliage trimming for improved driving visibility and aesthetics).
[10] Weather conditions, work zones, special events, and major incidents.

operations and strategies that seek to optimize existing capacity rather than simply building new capacity.

The close connection between the LRTP and the CMP requires that they be developed in an integrated manner, where the objectives of the LRTP flow into the CMP objectives, performance measures, and strategies—strategies that in turn will be selected for inclusion in the MPO's 2011 LRTP. To ensure this, this region's LRTP and CMP work programs and schedules must be coordinated.

In order to coordinate with the work program and schedule of the LRTP, staff designed this CMP work program to overlap with the 15-month time period in which the next LRTP will be developed. As the CMP work program contains tasks not directly related to the LRTP, CMP work will continue for five more months, for a total of 20 months. Most of the coordination between the CMP and the LRTP actually will occur under Tasks 1 and 2 of the LRTP work program.

OBJECTIVES

The main purpose of the CMP is to support the development of the MPO's Long-Range Transportation Plan, Unified Planning Work Program (UPWP), Transportation Improvement Program, and other planning activities, so that the MPO's certification documents promote and fund efficient transportation system management and operations strategies that benefit the region's economic vitality, safety, security, accessibility, mobility, quality of life, and energy conservation and that support preservation of the existing transportation system. To this end, the objectives of this proposed work program are to:

- Develop the CMP regional goals and operations objectives
- Define area of application and transportation system components covered
- Develop performance measures which are consistent with those of the LRTP
- Summarize and apply existing monitoring information and continue monitoring
- Identify congested locations, operational deficiencies and management, and operations and capital needs for the LRTP
- Identify and evaluate strategies to inform LRTP and UPWP development
- Select appropriate implementation strategies and include in LRTP and TIP
- Monitor strategy effectiveness
- Coordinate with transportation agencies' operations staff and LRTP/TIP staff
- Update CMP webpage
- Document CMP findings and recommendations
- Provide information and recommendations to the MPO to support its considerations of management and operations issues and its adoption of management and operations strategies and projects to meet the region's goals and objectives

WORK DESCRIPTION

The diagram on the following page shows the CMP work program's tasks and how they relate to the development of this region's certification documents: the LRTP, TIP, and UPWP. The task descriptions that follow provide the details on how staff will meet the above-stated objectives.

Task 1 Develop Regional CMP Operations Goals and Objectives

The CMP is part of developing the LRTP and the TIP; therefore, CMP operations goals and objectives naturally relate to, and flow from, these documents' goals and objectives. As such, the CMP goals and objectives relate to just about all focus areas, policies, visions, goals, and objectives of the LRTP.

The major focus of the CMP is the MPO policies related to system preservation, modernization, and efficiency, to mobility, and to the environment. In addition it is related most closely to the SAFETEA-LU planning factor "Promote Efficient System Management and Operations." This factor relates to accessibility/intermodality, reliability, system preservation/sustainability, modernization, efficiency, mobility, and safety and security. From these themes, staff will develop goals and objectives for the CMP.

The federal regulation guidance is for the CMP objectives to be Specific, Measurable, Agreed, Realistic, and Time-bound (SMART), in order to lead stakeholders to the accomplishment of the goal or goals for specific aspects of congestion.

Product(s) of Task 1

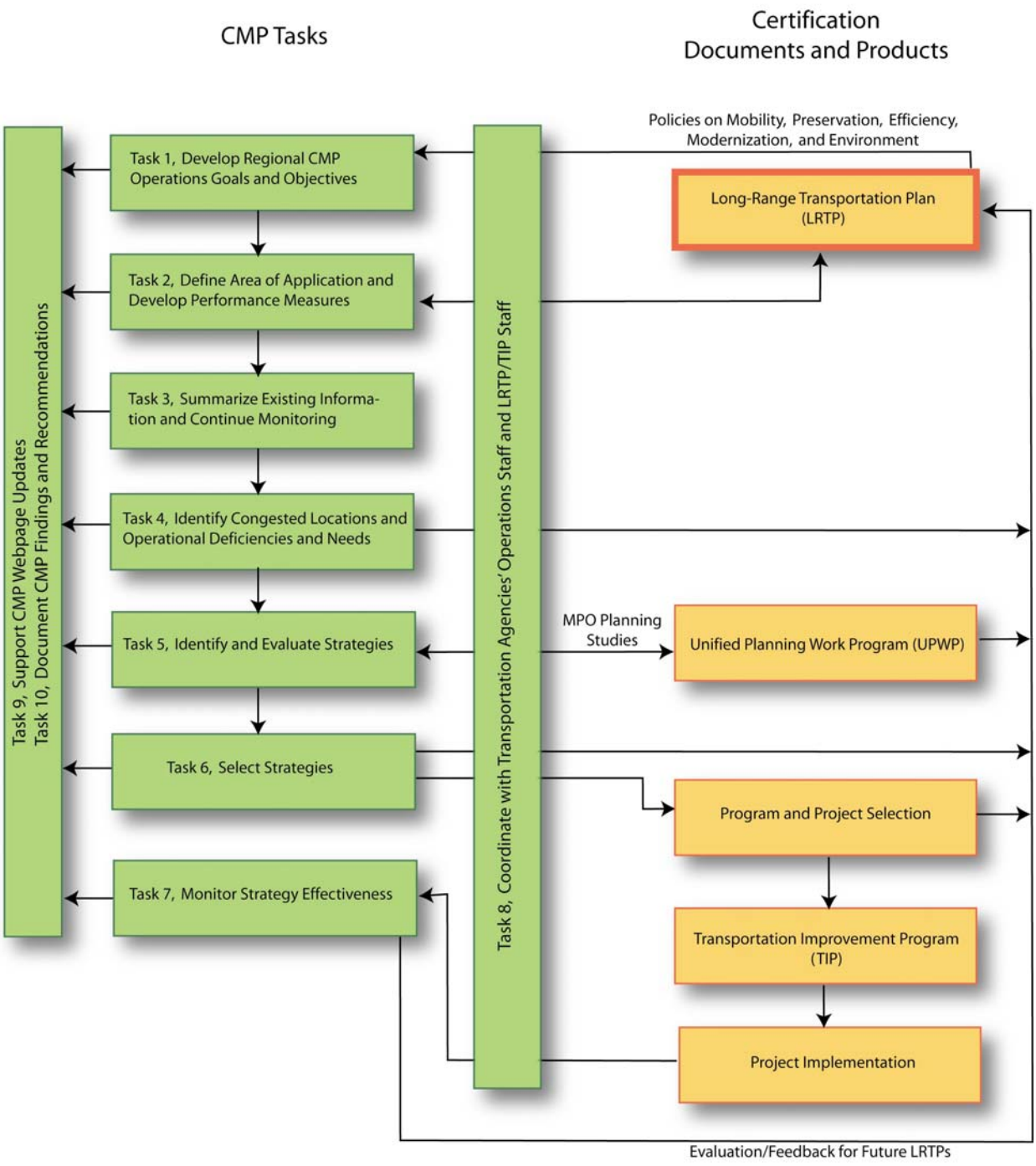
Staff will develop CMP goals and objectives for the management of congestion and improvement of mobility that are specific, measurable, agreed, realistic, and time-bound. The goals and objectives will flow from visions, policies, goals, and objectives defined in the LRTP, and most specifically from those that relate to system efficiency. A brief technical memo will describe the goals and objectives.

Task 2 Define Area of Application and Develop Performance Measures

The CMP will be applied, at a minimum, to the area that the Boston Region MPO covers; more specifically, the area the LRTP covers. Staff, in coordination and consultation with MassDOT and the MPO, may propose an extended geographic area based on the area covered by the MBTA system, the ITS architecture, the region's transportation planning model, or the area that will become part of the present urbanized Boston area[11] in the next 20 years. Alignment of the CMP area with these other systems will ensure that regional network and system descriptions are linked to it.

[11] Boston Transportation Management Area (TMA).

Boston Region MPO
Congestion Management Process (CMP):
Integration with Certification Documents



In addition to encompassing the entire metropolitan area, the CMP will place particular emphasis on needs and strategies pertaining to the corridors, travel patterns, and activity centers that the LRTP defined for evaluation as being of particular significance for accommodating travel, congestion management, operations, mobility, and other factors. Consideration of these factors will help in the definition of the LRTP corridors.

The CMP will be multimodal and will include, at a minimum, the modes traditionally included in this MPO's planning activities: roadways (arterials, freeways, interchanges, and intersections), public transit, park-and-ride, pedestrian, and bicycle. Truck transportation may also be included, depending on the LRTP's relevant performance measures. In this task, staff will derive CMP performance measures from the established CMP goals and objectives that were developed from the LRTP. The performance measures must be able to measure the extent, duration, intensity, and source of congestion and of mobility or safety deficiencies, must be able to evaluate strategy effectiveness, and must be established in a cooperative manner. They also must be measurable, have a clear and intuitive meaning, be comparable across time and geographic areas, have a relationship to actual system operations, and provide for cost-effective data collection.

Staff will continue to use some of the originally used measures from the CMS and the MMS. Also, new measures will be established based on the LRTP's goals and objectives and the operations strategies that will likely be evaluated. Potential measure categories include:

- Travel time (contour maps, congested speeds, speed index, other)
- Delay (percent incident delay per VMT, intersection delay, other)
- Level of service (percent VMT with LOS D or worse, other)
- Volume-to-capacity ratio (percent miles with v/c greater than 0.80 by functional classification, other)
- Freight-related (percent truck VMT by congestion level, other)
- Transit-related (passengers per revenue-vehicle-mile, average bus speed, other)
- Roadway-network-related (percent congested lane-miles, average person-speed, other)
- Nonmotorized-modes-related (percent of center-miles by town with sidewalks on one side, other)

Information and mapping developed in this task will be used in the LRTP discussions of existing conditions.

Product(s) of Task 2

- Maps showing the geographic area for CMP application, including corridors of significant interest for travel, congestion, operations, and mobility

- Maps showing the multimodal transportation system considered in the CMP
- A brief technical memorandum listing performance measures associated with LRTP and CMP objectives, by mode, and relevant to potential operational strategies to be evaluated

Task 3 Summarize Existing Monitoring Information and Continue Monitoring

Data is a prerequisite for the use of performance measures to identify needs. Since 1995, the MPO has had a well-organized, coordinated data collection and system performance monitoring program for congestion management and for the support of programming decisions in the UPWP, the TIP, and the LRTP. Specifically, staff monitor freeways for traffic volumes and speeds; interchanges for volumes, speeds, and crash rates; arterials for speeds and level of service; intersections for traffic volumes, level of service, bicycle and pedestrian accommodations, and crash rates; park-and-ride lots for utilization; bicycle parking for utilization; transit service for seating capacity and on-time performance; and HOV lanes for speed and vehicle occupancy.

For many of these categories of monitoring information, the MPO staff has current data that is relevant for the development of the proposed CMP program for federal fiscal years 2010 and 2011 and the associated LRTP. This is because transit and HOV lanes are being monitored continuously, freeway and interchange monitoring is very recent, park-and-ride lots are currently being monitored, and arterial conditions are rather stable. Staff will use existing information, supplemented by HPMS[12] 2005 to 2007 crash data, recent automatic traffic recorder (ATR) counts, transportation planning model runs, and census data, to map and summarize congestion locations and mobility problems area-wide and by corridor or by significant travel pattern.

In addition, staff will continue the intersection-monitoring program of the CMP and perform other monitoring as may be required by the development of the LRTP. This monitoring is described in Subtasks 3.1 and 3.2. Information from this monitoring activity will inform the LRTP assessment of needs and TIP evaluations.

Subtask 3.1 Intersection Monitoring Program

The quality of travel along an arterial roadway is largely determined by the quality of flow through intersections. For this reason, the operational performance of intersections must be monitored continuously. Often bottlenecks at intersections can be addressed by simple remedial actions that improve operations, such as coordination between signals, equipment updates, signal design updates for sensitivity to traffic flow changes, pedestrian signal updates, maintenance of markings and warning signs, and installation of new signals. Managing and operating intersections appropriately promotes safety for traffic, pedestrians, and bicyclists; lowers energy consumption; and improves mobility and air quality.

[12] Highway Performance Monitoring System.

To this end, staff began monitoring intersections under the 2005 MMS work program. Between 2006 and 2008, for over 200 intersections, field data, including counts, were collected, and analyses, including crash analyses, were conducted. In addition, data for up to 100 additional intersections became available from existing sources, including:

- Functional design reports
- Environmental impact reports
- CMS-related transportation studies

Presently, intersection performance information is available for display in the interactive intersection map of the CMP webpage in the Boston Region MPO website. This work has provided a better understanding of congested roadways and has improved upon the prioritization of intersection locations in need of improvements.

In this work program, staff will enhance intersection performance information for additional intersections. Over 1,000 of these will be selected from the CMP arterial roadway network, where travel time and delay information was collected during past CMP monitoring cycles. Staff will supplement this information by:

- Observing traffic operations
- Noting type of signal control by approach
- Documenting signal operations, including phasing, timing, and equipment
- Performing turning movement counts, including of heavy vehicles
- Observing and estimating vehicle queues
- Noting curb cut and property access in the intersection's vicinity
- Noting crosswalk and sidewalk design and condition
- Counting bicyclists and pedestrians
- Summarizing the number of crashes by type
- Recommending potential improvements

Other sources of intersection locations to monitor and study for possible recommendations for improvements will be conceptual projects in the TIP.

The final result of this task will be a catalogue of intersections and their mobility and safety issues. This catalogue will include a description of the issues and potential or proposed solutions that are based on a study's recommendations. The catalogue will be made available via the CMP webpage of the MPO website, discussed with the MPO, and used as input to the LRTP.

Subtask 3.2 Perform Other Monitoring

In addition to intersection monitoring, staff will perform other monitoring, as necessary, depending on the final management and operations objectives of the LRTP and the CMP. It could be that arterial travel times need to be updated based on travel time runs for a selected sample of arterials in the region. Another type of monitoring, useful for the planning and operation of transportation demand strategies, including HOV lanes, is that of vehicle occupancies. Vehicle occupancy data along key highways helps in determining congestion impacts using measures such as PMT (person-miles traveled) or average person speed (person-miles traveled divided by person-hours traveled).

Product(s) of Task 3

- Summaries of existing measures regionwide, by corridor, travel pattern, and mode of travel
- Field reconnaissance and data collection, processing, and analysis for intersections, including documentation of mobility and safety issues
- Data collection, processing, and analysis of additional monitoring information, as necessary
- Summary and discussion of the findings, provided via the website and via technical memos to the MPO for LRTP and TIP development

Task 4 Identify Congested Locations and Operational Deficiencies and Needs

In this task, staff will use the results of the previous task not only to identify congested locations and measure regional performance, but also to measure operational performance by LRTP corridor, subarea, facility, or service. This information will be presented to the MPO and used to determine needs for the LRTP and TIP.

Based on the goals and objectives of the LRTP and the CMP, staff and the MPO will first establish what is congestion and what is operational deficiency. The use of various thresholds can lead to the definition of concepts such as unacceptable congestion, lack of mobility, lack of accessibility, and other deficiency types by service, facility, or corridor. For example, slower speeds may be acceptable in the region's town centers but not so on freeways. Differentiating between types of congestion recognizes that the MPO stakeholders and the public do not expect reduction of all types of congestion at any cost.

Depending on the availability of operational data, staff will focus on identifying operational needs to the degree possible. Potential sources for such data are transit operations and AVL (automatic vehicle location) data, incident management data, City of Boston Traffic Operations data, CA/T Traffic Operations Center data, electronic toll collection data, and other sources.

Product(s) of Task 4

- Maps showing congestion locations regionwide, by corridor, travel pattern, or subarea
- Tables, maps, and graphs identifying services, facilities, and travel modes with operational deficiencies
- A technical memorandum, including the above products, to be discussed with the MPO and considered in the development of the LRTP

Task 5 Identify and Evaluate Strategies

In order for the Boston Region MPO to implement strategies consistent with its visions, goals, and objectives, the CMP and the LRTP must be performance-based. To that end, planning staff, the MPO, and agency operators must first identify strategies that mitigate congestion and operational deficiencies and then evaluate them using the performance measures identified in Task 2. Evaluation will lead to the selection of effective strategies to include in the LRTP.

Staff will work with agency operators and service providers complete this task. The following are examples of strategies that can be included in the MPO's CMP strategy "toolbox" and be considered for inclusion in the LRTP:

- Operating Existing Capacity More Efficiently
  - Transit signal priority
  - Optimizing the timing of traffic signals
  - Effective incident response
  - Coordinating transit service schedules
  - Access management
  - Identifying weather and road surface problems for rapid response
  - Improving management of work zones
  - HOV lanes

- Demand Management
  - Providing real-time information on transit schedules and arrivals
  - Parking management
  - Telecommuting programs
  - Suburban transit programs
  - Programs that encourage transit use, ridesharing, bicycling, and walking
  - Congestion pricing
  - Employer-based programs

- Land Use Strategies
  - Transit-oriented development
  - Smart growth/clustering development
  - Urban design

- Infrastructure Development
  - Adding capacity to the transit system
  - Removing bottlenecks at interchanges
  - Removing bottlenecks at lane drops
  - Adding bicycle or pedestrian transportation capacity

A CMP toolbox of potential strategies such as these is a framework for responding to congestion. For example, since one of the present policies of this MPO is to "Put priority on projects that maintain, repair, and modernize existing infrastructure,"[13] roadway capacity projects would be considered after other strategies from the toolbox, such as demand management or operations, have been applied. Also, strategies can be individual programs or projects (for example, incident management or bus AVL) or be implemented as part of a safety project or capacity improvements (for example, HOV lanes or ramp metering as part of a lane expansion project.).

Strategies from the CMP toolbox will have to be evaluated for effectiveness and for prioritization. Although there is a limited number of inexpensive tools that one can use to quantify benefits from these strategies, staff will apply qualitative and quantitative methods, to the extent that resources allow it, to predict the effects of operational strategies on system performance. This information will be used to assist the MPO in identifying strategies for inclusion in the LRTP. Tools available to staff, include:

- Sketch planning tools
- Travel demand forecasting model post-processors
- Simulation models (SYNCHRO, CORSIM, VISIM)
- Transportation planning model
- Archived data for before-after analysis

Staff feel it is likely that only very important strategies—and a minimal number of them—will be tested with quantitative methods as part of this work program, due to funding and schedule constraints. Evaluations will most likely be done qualitatively or using some preliminary, sketch-planning methods and tools. Additional evaluations could be done as part of projects funded in the UPWP over a period of time covered by the next LRTP.

Product(s) of Task 5

A technical memorandum on the following:

- Toolbox of available strategies
- Inventory of available analytical tools

[13] *JOURNEY TO 2030,* Visions and Policies section, page 4-2.

- Evaluation of selected strategies for effectiveness for identified congested locations, services, facilities, or modes
- Short-list of strategies for implementation or further study

Task 6 Select Appropriate Implementation Strategies and Include in LRTP, TIP, and UPWP

In this task, staff and the MPO will coordinate with project sponsor agencies and municipalities to select appropriate implementation strategies. Strategies will be categorized as short-term or long-term, depending on horizon of completion. The results of this task will be incorporated in the LRTP and TIP project selection or in the UPWP for further study.

For management and operation strategies, the LRTP could reflect this task in two different ways:

- contain a chapter specifically dedicated to management and operations strategies, or
- include a discussion of management and operations strategies in the context of LRTP strategies aimed at fulfilling goals and objectives of the LRTP that relate to improving congestion, mobility, accessibility, and safety, focus areas of the CMP.

Product(s) of Task 6

- A list of selected strategies, projects, programs, partnerships, and management approaches to implement and fund in the LRTP or TIP, or to study further in the UPWP

Task 7 Monitor Strategy Effectiveness

The purpose of this task is to:

- Evaluate the effectiveness of implemented strategies using the adopted performance measures
- Document successes and failures
- Provide feedback to beginning steps of CMP and LRTP for future interactions

These evaluation elements are important because they can: help transportation agencies communicate to the public and decision makers about the benefits of the adopted strategy, project, or program; track system performance; assess and refine operations objectives; support effective decision making; and inform decision makers of whether adjustments are needed for various strategies to work better.

This is a key step in the process prescribed by the federal regulation guidance, and enough time will be spent by staff on this task to formulate the monitoring program to begin after implementation of projects from this LRTP cycle. It may take some time to

study, fund, and implement most of the strategies selected as part of this integrated process. However, it is possible that management-type strategies or short-term operational improvements could be evaluated in the context of this work program. These types of strategy evaluations include before-and-after assessments of traffic signal timing improvements and coordination, bus rapid transit improvements (queue jumps, busways, signal priority), and removing bottlenecks.

Product(s) of Task 7

- Results from program, project, and strategy evaluation studies
- Development of guidelines or incentives for local governments that receive funding to conduct evaluation studies

Task 8 Coordinate with Transportation Agencies' Operations Staff and LRTP/TIP Staff

For the CMP to be fully integrated with the LRTP and the TIP through an objectives-driven approach to planning for operations, staff and the MPO must foster regional collaboration among the MPO, MPO and transportation agency planning staff, agency operators, safety officials, and others who routinely affect or depend on the region's transportation system. The involvement of operations, safety, and emergency response professionals from the following agencies would be required:

- MassDOT
  - Massport
  - MBTA
  - Highway Division
- City and town operations staff
- Police and fire officials
- Truck freight shippers
- Emergency response
- Business organizations

Engaging agency operator stakeholders to think in terms of regional management and operations objectives and programs is key to the success of incorporating management and operations strategies in the LRTP. Specifically, it is important to engage day-to-day-operations managers from a systems operations perspective and not from a capital projects perspective. One way to start this effort is by participating in existing forums in the region, like the regional ITS architecture or the ongoing safety evacuation planning efforts, sponsored by MassDOT. The role of the MPO would be to support MassDOT-sponsored interagency operations coordination and to promote the funding of effective strategies in the LRTP and the TIP. For example, MPO staff can facilitate interjurisdictional coordination and data sharing, help address funding strategies, increase operators' awareness of broader regional trends, needs, and strategies, deal with detailed technical or policy issues, and prioritize operations initiatives.

Product(s) of Task 8

- MPO staff support of a structure and a process that facilitates interagency collaboration for the purpose of identifying, through a performance-driven approach, operations strategies to fund in the LRTP and the TIP

Task 9 Support CMP Webpage Updates

One of the main components of the 2005 MMS work program[14] was to develop and maintain a webpage for the documentation and dissemination of MMS findings and of related information. This task is now complete, and the webpage[15] has become the primary medium for disseminating the findings from each of the program's tasks. Staff and other users visit the webpage seeking information and data to input in various types of analyses.

However, as new information and data become available, the webpage needs to be updated periodically. For example, the results of the monitoring and evaluations described in this work program will be uploaded, including text that describes the method of data collection and analysis, the results, and recommendations.

Product(s) of Task 9

- Further development and maintenance of CMP webpage, including uploading data and information collected and analyzed as part of this work program's monitoring

Task 10 Document CMP Findings and Recommendations

The purpose of this task will be to develop a technical briefing report to document the nine steps in the CMP process, the findings, and the recommendations for incorporating selected strategies in the LRTP and the TIP.

Product(s) of Task 10

- Technical report documenting CMP process, including findings and recommendations

ESTIMATED SCHEDULE

It is estimated that this project will be completed 20 calendar months after the notice to proceed is received. The proposed schedule, by task, is shown in Exhibit 1.

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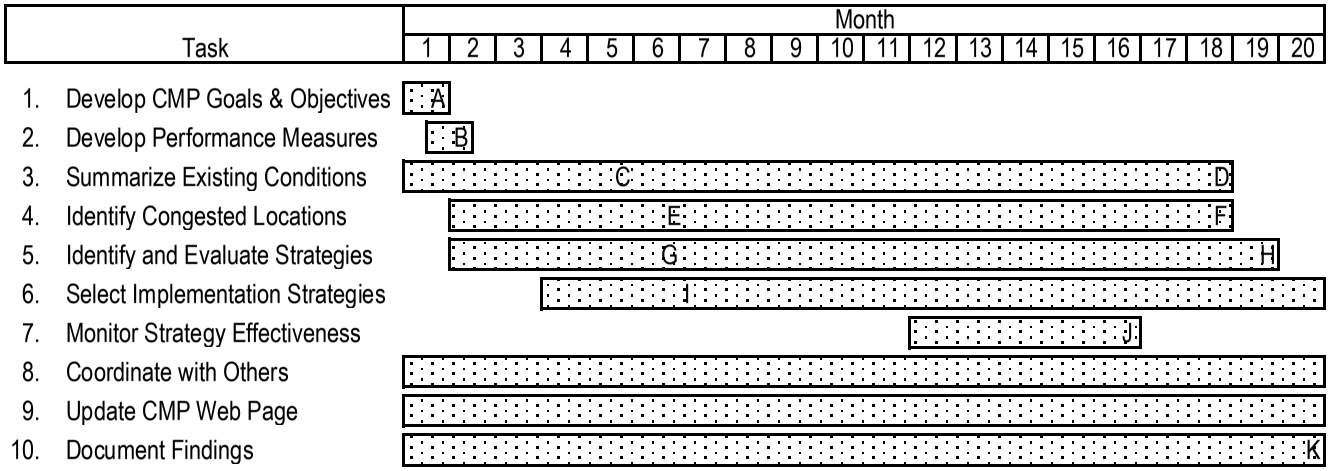
[14] Work program for Mobility Management System (MMS), 2005-2008, October 20, 2005.
[15] http://www.bostonmpo.org/bostonmpo/3_programs/6_mms/mms.html

ESTIMATED COST

The total cost of this project is estimated to be $383,053: $155,000 in FFY 2010 and $228,053 in FFY 2011. This includes the cost of 201.0 person-weeks of staff time, overhead at the rate of 88.99 percent, and travel. A detailed breakdown of estimated costs is presented in Exhibit 2.

AJS/EP/ep

Exhibit 1
ESTIMATED SCHEDULE
Congestion Management Process (CMP): February 2010, to September 2011



Products/Milestones

A: Technical memorandum no. 1
B: Technical memorandum no. 2
C: Technical memorandum no. 3
D: Technical memorandum no. 4
E: Technical memorandum no. 5
F: Technical memorandum no. 6
G: Technical memorandum no. 7
H: Technical memorandum no. 8
I: Technical memorandum no. 9
J: Technical memorandum no. 10
K: Technical Report

Exhibit 2
ESTIMATED COST
Congestion Management Process (CMP): February 2010, to September 2011

Direct Salary and Overhead	**$382,053**

Task	Person-Weeks								Direct Salary	Overhead (@ 88.99%)	Total Cost
	M-1	P-5	P-4	P-3	P-2	P-1	Temp	Total			
1. Develop CMP Goals & Objectives	1.0	0.5	0.0	1.0	0.0	0.0	0.0	2.5	$3,464	$3,083	$6,546
2. Develop Performance Measures	1.0	0.0	0.0	4.0	0.0	0.0	0.0	5.0	$5,753	$5,120	$10,873
3. Summarize Existing Conditions	2.0	0.0	0.0	16.0	0.0	36.0	2.0	56.0	$44,990	$40,036	$85,026
4. Identify Congested Locations	3.0	0.0	3.0	10.0	5.0	15.0	2.0	38.0	$34,248	$30,477	$64,725
5. Identify and Evaluate Strategies	6.0	8.0	0.0	20.0	10.0	3.0	0.0	47.0	$53,727	$47,812	$101,539
6. Select Implementation Strategies	4.0	2.0	0.0	3.0	0.0	0.0	0.0	9.0	$12,827	$11,414	$24,241
7. Monitor Strategy Effectiveness	1.0	0.0	3.0	6.0	0.0	2.0	3.0	15.0	$14,345	$12,765	$27,110
8. Coordinate with Others	1.0	0.0	0.0	2.0	0.0	0.0	0.0	3.0	$3,695	$3,288	$6,984
9. Update CMP Web Page	0.5	2.0	0.0	5.0	0.0	2.0	0.0	9.5	$10,500	$9,344	$19,845
10. Document Findings	4.0	2.0	0.0	6.0	0.0	4.0	0.0	16.0	$18,606	$16,558	$35,164
Total	23.5	14.5	6.0	73.0	15.0	62.0	7.0	201.0	$202,155	$179,898	$382,053

Other Direct Costs	**$1,000**
Travel	$1,000

TOTAL COST	**$383,053**

Funding

3C PL Transportation Planning Contract #59796