

## Potential CMP Work Program Tasks—Federal Fiscal Year 2016

### High-Priority Tasks

#### Task 1 Support for the CMP Committee and Additional CMP Staff Activities— \$9,484

The Boston Region Metropolitan Planning Organization (MPO) Congestion Management Process (CMP) committee was formed in January 2012. The purpose of the CMP committee is to help implement recommended solutions from the most recent CMP report, the Long-Range Transportation Plan (LRTP), the Transportation Improvement Program (TIP), and corridor studies.

The CMP committee will meet approximately four times during federal fiscal year (FFY) 2016. In order to support the CMP committee, MPO staff will organize and attend CMP committee meetings; create agendas, take minutes, present materials; and ensure that the meetings are accessible according to the Americans with Disabilities Act (ADA). When the CMP staff completes a task, it will present the results formally to the MPO.

Other CMP-related activities include monitoring progress of the TIP's Intersection Improvement Program; enhancing the CMP's Express Highway Performance Dashboard and Arterial Performance Dashboard; and evaluating projects for CMP criteria that were submitted for the FFYs 2017–21 TIP.

#### *Subtasks*

- Prepare materials for CMP committee meetings
- Monitor TIP Intersection Improvement Program
- Evaluate FFYs 2017–21 TIP Projects through the CMP
- Ensure that the CMP complies with the Moving Ahead for Progress in the 21st Century Act (MAP-21)
- Refine performance measures

#### *Products of Task 1*

- Materials for CMP committee meetings
- Letters to communities to solicit their interest in participating in the Intersection Improvement Program
- List of TIP projects that passed CMP evaluation
- Revised list of performance measures, if applicable

## Task 2 Analyze the Regional Economic Costs of Congestion—\$27,629

The Boston Region MPO will produce a white paper to calculate the cost of time lost because of traffic congestion. For this effort, staff will use INRIX data, combined with data from other sources. The methodology for calculating the cost of delay will be tailored to 2012 land use and transportation characteristics in the MPO region. The findings of this white paper may be used to develop future evaluation criteria for the CMP or the TIP.

### ***Subtasks***

- Review literature to show what other organizations have accomplished in this area
- Research current methodologies for calculating the cost of congestion to the Boston region
- Develop a new process to calculate accurately the cost of congestion on the Boston region's economy
- Prepare a white paper or memorandum that describes the relationship between congestion and economics in the Boston region

### ***Product of Task 2***

- Technical memorandum

## Task 3 Transit Bus Performance Monitoring—\$13,310

In December 2014, the MPO's federal planning certification review recommended that the agency update its CMP transit-monitoring procedures, which evaluate performance monitoring on the Massachusetts Bay Transportation Authority (MBTA) bus system. In the past, the CMP has utilized two performance measures to monitor congestion on the MBTA bus system: on-time performance and passenger crowding. Staff will need to evaluate whether it should add more performance measures for this purpose. Ideally, transit performance measures should contain data that is readily available to the MPO. Staff should contact the Massachusetts Department of Transportation (MassDOT) and the MBTA to see what data they have collected already (e.g., automatic vehicle location data, passenger counts, wait time data, etc.). The selected performance measures should be consistent with those used for the LRTP's objectives (e.g., a major objective of the LRTP is to improve the public transportation system's reliability).

The Boston region MPO will obtain pre-existing data for this task from various sources such as the MBTA. Once staff has the data, it will calculate and map them, then write a short memorandum to summarize the findings.

***Subtasks***

- Research performance measures
- Obtain data from sources
- Create maps and calculate performance measures
- Write a memorandum to document findings
- Present findings to the CMP Committee

***Products of Task 3***

- Technical memorandum
- Updated list of transit performance measures for the CMP

**Task 4 Add/Extend Coverage Routes of 2012 Express Highway Performance Dashboard and Arterial Performance Dashboard—\$16,668**

This task will consist of minor updates to the existing dashboards to expand coverage to include the entire MPO model region, which consists of 164 communities, instead of the actual MPO region, which contains 101 communities. The Arterial Performance Dashboard also will be expanded to include several more arterial roadways that are located in Boston Proper.

***Subtasks***

- Calculate performance measure values for additional roadways
- Upload additional data to the Express Highway and Arterial Performance Dashboards

***Products of Task 4***

- Updated version of the Express Highway Performance Dashboard
- Updated version of the Arterial Performance Dashboard

**Task 5 Build Arterial and Express Highway Performance Dashboards for 2014 or 2015 Data—\$24,623 if INRIX is Used, \$24,623 if NPMRDS Data are Used<sup>1</sup>**

Currently, the Express Highway Performance Dashboard and the Arterial Performance Dashboard display 2012 data from INRIX, the dataset that was purchased for \$53,900. The Boston Region MPO is in the process of determining if it may obtain a more recent dataset from INRIX or another provider. The MPO also is

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<sup>1</sup> Cost does not include purchase of either dataset.

exploring the possibility of collaborating with other organizations such as Boston University or MassDOT to obtain access to a new INRIX dataset. Currently, the options are either to purchase another INRIX dataset for a fee or use the National Performance Measure Research Dataset (NPMRDS) at no charge.

The NPMRDS is provided to MPOs at no cost through an agreement with the Federal Highway Administration (FHWA) and HERE<sup>2</sup>. Although the NPMRDS presently is available at no cost, the contract between FHWA and HERE will expire in 2017, so the availability, price, or format of NPMRDS data may change. If INRIX data is used, the 2012 dataset potentially could be compared to the newer dataset to see where congestion is increasing in the roadway network. If the NPMRDS is selected, then staff recommends that the dataset not be compared to the 2012 INRIX data because it is not good practice to compare two datasets that employ different collection methodologies.

Regardless of which dataset is selected, the performance measures that presently are on the dashboards would be updated to reflect the current year. Thus, in either case, staff would need to calculate and upload the performance measures onto the dashboards.

### ***Subtasks***

- Make a decision to use either the INRIX or NPMRDS dataset
- Obtain either the INRIX or NPMRDS dataset
- Calculate performance measures based on turning movement counts
- Calculate the change in performance measure values (this subtask is not possible if the NPMRDS is used due to the differences between the INRIX and NPMRDS datasets)
- Upload data to dashboards

### ***Products of Task 5***

- Updated version of the Express Highway Performance Dashboard
- Updated version of the Arterial Performance Dashboard

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<sup>2</sup> HERE is a company, owned by Nokia, that brings together mapping and location businesses under one brand, which the NPMRDS uses to collect data.

## Medium-Priority Task

### Task 6 Interactive CMP Congestion Scans—\$5,450

In FFY 2015, staff's Information Technology and Services (IT&S) group built a proprietary in-house application to generate congestion scans. This is a stand-alone application that works by querying the dataset instantly via Google BigQuery and displaying colors to represent congestion levels. These graphical illustrations show where congestion is located along a roadway during a typical day. The scans can pinpoint the exact location of congestion and help planners determine what is causing it. With this tool, staff can provide on-demand congestion scans for all CMP-monitored roadway corridors.

To date, staff have created congestion scans for 11 expressways and 22 major arterial roadways in the Boston Region MPO area. However, staff is studying many roadways in the Boston region that do not have congestion scans. Thus, a goal of this task is for IT&S staff to enhance the congestion scan tool to allow the instant generation of congestion scans on CMP-monitored roadways. In addition, MPO staff incurs a cost whenever it executes Google BigQuery. Hence, these costs will need to be managed.

#### ***Subtasks***

- Add a legend to the stand-alone congestion scan on the dashboard
- Create a query to measure data based on pre-established CMP criteria
- Enable the congestion scan tool to display congestion over a 24-hour day (the current version of the congestion scan tool only has the capabilities to generate congestion scans for three-hour periods)
- Enable the congestion scan tool to display average speed, speed index, and travel time index

#### ***Product of Task 6***

- Enhanced congestion scan application, with the improvements listed above, will allow the production of on-demand congestion scans for planning studies.

## Low-Priority Tasks

### Task 7 Bicycle Parking/MBTA Park-and-Ride Lot Monitoring—\$34,047 if Temporary Staff Collect Data; \$50,961 if MPO Staff Collect Data, Including Direct Costs

In the past, Boston Region MPO staff have assembled both MBTA parking lot (2013) and bicycle parking inventories (2012) separately, and then shared this analysis with

MassDOT and the MBTA. MassDOT has expressed interest in working with MPO staff to collect updated bicycle parking data at MBTA stations.

Two hundred and seventy-nine (279) MBTA stations would need to be surveyed for bicycle parking data. Additionally, the MBTA parking lots, which have not been surveyed since 2013, also would need to be updated. Because it is less costly to make a single visit to stations that offer parking for both modes, this collection effort will combine the data for both bicycle and automobile parking.

Station fare data may be available from the MBTA, which could help determine park-and-ride utilization. Bicycle parking data may be available from the MBTA for cyclists who are registered to store bikes in cages. This task could be spread out over two federal fiscal years, if necessary. In addition, this task may be better suited as a Unified Planning Work Program study rather than a CMP-based study.

#### *Subtasks*

- Collect data at MBTA stations
- Process collected data
- Conduct analysis of data
- Write memorandum to summarize findings from data analysis
- Present data to MPO or CMP committee

#### *Products of Task 7*

- Memorandum summarizing automobile parking at MBTA stations
- Memorandum summarizing bicycle parking at MBTA stations

### **Task 8 Create Quarterly Congestion Reports for MAP-21 Performance Targets Using INRIX or NPMRDS Data—\$8,521**

One of the new requirements for MAP-21 is to monitor performance targets. One method of monitoring congestion management-related performance targets is to create periodic reports. These reports would display congestion trends for the entire Boston Region MPO area. Staff will create these reports quarterly. The performance measures will be calculated for the composite region, rather than being based on corridors or segments. Examples include:

- Regional Travel Time Index
- Regional Planning Time Index

Any performance measures that are selected for regional performance monitoring should be consistent with the LRTP. Freight performance measures also can be used if the NPMRDS is chosen for this activity.

*Subtasks*

- Research and determine performance targets
- Calculate values of performance targets
- Produce four quarterly reports (memoranda should be less than five pages and will consist mostly of graphical representations)

*Product of Task 8*

- Four reports produced quarterly and displayed on the Boston Region MPO website

**Task 9 Congestion Management Strategies Toolkit—\$22,539**

In 2013, a congestion management report<sup>3</sup> was completed that described the Boston Region MPO's CMP. Chapter six of the report cited six strategies for improving a congested corridor:

- 1) Travel demand management
- 2) Use of nonmotorized modes
- 3) Incident management
- 4) Intelligent transportation systems
- 5) Management and operations
- 6) Public transportation

The proposed task would create a toolkit to detail each individual strategy, explain how to implement it, and provide a classic example of the strategy.

The study also would analyze the before-and-after effects of the strategies, such as the change in average speed or speed index if a particular strategy were implemented. This toolkit would be shared with local municipalities to show how low-cost strategies can improve congestion.

*Subtasks*

- Research strategies
- Write a detailed memo about strategies
- Present strategies to CMP committee

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<sup>3</sup> Boston Region MPO Congestion Management Process Performance-Based Planning for Efficiency, Mobility, and Safety, available online at <http://www.ctps.org/cmp>.

*Product of Task 9*

- Strategies toolbook report

**Task 10 Update Monitored Intersection Database—\$35,225 (Estimated)**

The MPO website contains an interactive tool that displays detailed information about many of the region's intersections. This database contains data that were collected from various sources, such as speed runs, surveys, and independent studies. The database includes statistics about control signals, travel time delay, crash data, transit information, and bicycle and pedestrian information.

This database was last updated in 2012 and currently contains outdated data. The task will require extensive work from both IT&S and CMP staff. Instead of conducting site visits to update the database, CMP staff will look at data collected from recent planning studies and MassDOT functional design reports. The original database contains more than 1,200 intersections. To reduce the workload of the update, staff will focus on only 100 intersections. The criteria displayed in the application will be simplified to make optimal use of data from previous studies. Because this update would require a lot of work by the IT&S group, it may be costly; however, it might be possible to spread this task over several federal fiscal years.

*Subtasks*

- Redefine criteria stored in the database to reflect available data
- Select 100 intersections to display on the monitored intersection database
- Obtain data from all sources (MPO planning studies, functional design reports, crash data, etc.). CMP staff would need to look at these data sources and compile intersection data
- Add all data to database
- Update database on MPO website

*Product of Task 10*

- Updated version of the monitored intersection database on the MPO website

**Task 11 MassDOT Park-and-Ride Monitoring—\$12,278**

Every few years, MassDOT park-and-ride lots are monitored, and parking utilization is reported through the CMP. Because MassDOT park-and-ride lots have not been monitored since 2011, they need to be monitored again. The monitoring process entails surveying each lot for parking capacity, parking utilization, and license plate numbers. The license plate numbers will be used to track origin-destination movement. Once the surveying has been completed, staff will write a short memorandum to explain the findings. This task can be spread over two federal fiscal years.



*Subtasks*

- Collect data at MassDOT park-and-ride lots
- Process data
- Analyze data
- Write memo to summarize findings
- Present results to CMP committee

*Products of Task 11*

- Memorandum to present findings from MassDOT park-and-ride surveys
- MassDOT park-and-ride data to be displayed on the MPO website