CONGESTION MANAGEMENT PROCESS JULY 2013



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1| Executive Summary

The Congestion Management Process (CMP) provides the Des Moines Area Metropolitan Planning Organization (MPO) and its members with information and guidance on operation of the transportation network. Fortunately in the MPO area congestion is not a major issue at the present time. The objective of this document is to stay ahead of any potential problems with the network so that the system continues to operate effectively.

There are 12 primary objectives contained in this document that will assist the MPO in maintaining an efficient and effective transportation network. These 12 objectives are directly linked to goals in the 2035 Metropolitan Transportation Plan (MTP). The MTP contains goals that are very long term. The CMP offers shorter term objectives that the MPO can measure more often to determine if current strategies are working and adjust accordingly without compromising the MTP.



2| Background

2.1 Des Moines Area Metropolitan Planning Organization

The MPO acts as the formal transportation body for the greater Des Moines metropolitan area (see Figure 1 below). The MPO exceeds the population threshold of 200,000 qualifying the area as a Transportation Management Area (TMA). The MPO is committed to implementing a comprehensive, coordinated, and continuing multimodal transportation planning process for the greater Des Moines metropolitan area.

The MPO provides a regional forum to ensure coordination between local, state, and federal agencies in regard to planning issues and to prepare transportation plans and programs. The MPO develops both long and short-range multimodal transportation plans, selects and approves projects for federal funding based upon regional priorities, and develops methods to reduce traffic congestion.

The MPO structure is comprised of three committees: the Executive Committee, the Transportation Technical Committee (TTC), and the MPO, which functions as the policy committee (see Figure 2 below). The TTC is comprised primarily of technical staff members, including planners, engineers, and city administrators, representing member governments and participating agencies. The MPO includes elected officials, such as county supervisors, mayors, and city council members, and city managers. The MPO elects officers and at-large representatives to form the Executive Committee. MPO staff supports these three committees.





2.2 Congestion Management Process

The Congestion Management Process (CMP) is a systematic approach, collaboratively developed and implemented throughout a metropolitan region that provides for the safe and effective management and operation of new and existing transportation facilities through the use of demand reduction and operational management strategies. The CMP is required to be developed and implemented as an integral part of the metropolitan planning process in TMA. The CMP is a multi-step process that typically includes:



3| Congestion Management Objectives

The MPO's *Horizon Year 2035 Metropolitan Transportation Plan* (HY 2035 MTP) identifies a vision, goals, and objectives for the Metropolitan Planning Area (MPA). The vision, goals, and objectives establish the framework for achieving the desired transportation system.

Mobility is often closely tied to travel times and congestion, and is commonly defined as the ease in which a user is able to make a trip. The HY 2035 MTP identified a number of goals and objectives to maintain and/or improve the performance and/or mobility of the transportation system through efficient congestion management. In order to accomplish these goals and objectives the CMP provides additional analytical methods to monitor and evaluate system performance in dealing with congestion.

3.1 HY 2035 MTP Vision Statement:

"Preserve and promote the quality of life and the economic vitality of the greater Des Moines metropolitan area by providing an accessible, integrated, efficient, safe, and environmentally responsible multimodal transportation system that supports balanced growth by encouraging economic development in all areas of the metropolitan region."

3.2 HY 2035 MTP Goals:



*Goals 2, 3, and 4 contain objectives that impact the CMP

3.3 HY 2035 MTP Objectives:

Objectives from the HY 2035 MTP that impact the CMP include: Objectives 2.1 through 2.11, 3.1 through 3.3, and 4.1 through 4.6.

3.4 CMP Objectives:

The following objectives are derived from the MTP and are specific to the CMP.

Re-Occurring Congestion – Peak Hours

- A.1 Autos: Achieve level of service "D" system wide during peak hours.
- A.2 Public Transportation: Increase ridership by 10% by 2022.
- A.3 Personal Transportation: Increase the number of bicycle/pedestrian trips by 2% by 2022.

Re-Occurring Congestion – Non Peak Hours

- B.1 Autos: Achieve level of service "B" during non-peak hours.
- B.2 Public Transportation: Increase the hours of operation on fixed routes by 10% by 2022.
- B.3 Personal Transportation: Expand bicycle/pedestrian facilities by 10% by 2022.

Non Re-Occurring Congestion

- C.1 Traffic incidents: Decrease incident clearance times by 10% by 2017.
- C.2 TDM-10: Increase carpooling by 10% by 2017.
- C.3 Work Zones: Utilize Intelligent Transportation Systems (ITS) network for all construction projects with peak hour impacts by 2017.
- C.4 Weather: Utilize ITS to relay National Weather Service updates that will have potential traffic impacts by 2017.
- C.5 Special Events: Develop alternative routes for through traffic near special events and utilize ITS to assist in diverting traffic by 2017.
- C.6 Freight: Decrease identified impedances for freight by 10% by 2022.

4| System Definition

The Des Moines Area MPO's CMP system includes two entities. One entity is the MPA's Principal Arterial System as defined by the MPO's Federal Functional Classification System (FFCS). The FFCS establishes a classification hierarchy among streets and highways in the MPA. Interstate Highways and Principal Arterials are situated atop the hierarchy, and tend to carry the major portion of trips and serve the major centers of activity. The roadway network is depicted in Figure 1.

The other entity of the CMP system includes the area's transit system operated by the Des Moines Area Regional Transit Authority (DART). DART serves 19 area communities in and around Polk County with varying levels of service. Service includes local routes, express routes, shuttles and on-call service. DART plans to add Bus Rapid Transit (BRT) in the near future through the implementation of the *DART Forward 2035 Transit Services Plan*.

5| Developing and Using Performance Measures

5.1 CMP Performance Measures:

- Accessibility Measures
- Delay (intersection)
- Freight Measures
- Incident Clearance Times
- Land Use Measures
- Level of Service (volume/capacity)
- Multimodal Measures
- Speeds (freeways via TMC)
- Transit System Measures
- Travel Times (arterial corridors via travel time survey)
- Variability/Reliability
- Volume to Capacity Measures
 **Items in bold are currently utilized by the MPO*

Performance measures allow the MPO to define, measure, and communicate levels of congestion based on both spatial and time oriented criteria. Many of the measures are segment-or site-specific, such as level of service, and intersection delay. Congested roadways were mapped in the HY 2035 MTP using this type of data.

6| Performance Monitoring Plan

The MPO will monitor system performance through various means.

Travel Time Survey

The MPO annually performs a travel time survey to gauge the level of congestion, in terms of delay or reduction in free flow travel speeds, on the Principal Arterial System. The MPO performs the Travel Time Survey (TTS) by utilizing Global Positioning System (GPS) equipment to actively survey a designated corridor. The recorded GPS data is analyzed and summarized into an annual report. The annual report documents the findings and compares the survey's results to historic survey results to gauge changes in travel speeds. The TTS is conducted on an annual basis in the fall.

Vehicle Occupancy Survey

The MPO annually performs a Vehicle Occupancy Survey (VOS) to assist in evaluating both the number of people per vehicle and the percentage of people utilizing various modes of transportation. This data is collected manually by Des Moines Area MPO staff at various pre-determined key areas throughout the area. The annual report documents the findings and compares the survey's results to historic survey results to evaluate changes in occupancy and mode. The VOS is conducted on an annual basis in the fall.

Traffic Management Center

The MPO summarizes and analyzes traffic data from the Iowa Department of Transportation's (DOT) Traffic Management Center (TMC) on a quarterly basis. The Iowa DOT's TMC monitors the Intelligent Transportation System (ITS) infrastructure. This ITS infrastructure is comprised of a series of cameras, sensors, and digital message signs. The data is processed and relayed to a website, <u>www.iowa511.org</u>. The TMC collects traffic data from the numerous sensors along the freeway system, and includes traffic speeds and volumes. The data is summarized into 15-minute intervals at each sensor location.

Travel Demand Modeling

The Travel Demand Model (TDM) is operated and maintained by the MPO on an ongoing basis. The TDM is utilized to provide data related to volume and capacity of the transportation network. The TDM undergoes periodic reviews to ensure that the data collected is the most accurate and up to date data available.

Traffic Counts

Each jurisdiction in the MPO boundary conducts traffic counts on an independent basis. There is a need in the region to engage in a more coordinated effort with traffic counts and other related data, such as traffic signal timing that have significant impacts on the regional traffic patterns.

DART Ridership

DART ridership is compiled and reported to the MPO each spring. The MPO uses this data in the TDM as well as reporting the data to the various committee's each month to obtain feedback on potential improvements to the transit system.

Trail Counters

The MPO provides and maintains a set of trail counters and a software program that analyzes the data collected by the counters. Currently the program analyzes trail data at specific locations upon the request of MPO member jurisdictions. The MPO is developing the methodology for a region wide survey of trail data to be implemented in the near future. Data is collected on a monthly basis throughout the year.

The Des Moines Area MPO staff summarizes all of the above data and identifies areas of concern as well as areas that are performing well. This information is compiled in an annual report each spring.

7| Identification and Evaluation Strategies

Data collected in the monitoring phase of the congestion management process will be evaluated. The evaluation process for this data will utilize the strategies described in this section on a case by case basis.

7.1 Operational Management Strategies

Traffic Operational Improvements

Traffic Operational Improvements, which include improvements in traffic signalization, channelization, and highway geometrics, have been used extensively by MPO member governments, especially at intersections. Such projects can provide significant congestion-related benefits with only small investments in time, money, and labor. The MPO established a category in its Surface Transportation Program (STP) project ranking criteria for Minor Construction, which includes Traffic Operational Improvements. Each year the MPO spends between 5 percent and 15 percent of its annual STP allocation for minor construction projects. Additionally, MPO member governments have often constructed Traffic Operational Improvements projects without the assistance of Federal funding sources.

Access Management

Access management principles, which typically involve standards for driveway spacing and median openings, have customarily been incorporated into the design for construction of new streets and highways and improvements to existing streets. In 2004, the Center for Transportation Research and Education (CTRE) at Iowa State University completed the Development of the *Des Moines Access Management Plan*, which provided recommendations for possible improvements and best access management practices. The results of this study were shared with MPO member governments and agencies. Iowa DOT and MPO member governments created an access management agreement along U.S. Highway 6 (Hickman Road) to limit access along the corridor. Similar access management agreements have been reviewed for other corridors in the MPA.

Incident Management

Incident management includes various activities that help mitigate non-recurring congestion, such as rapid detection and response to accidents and stalled vehicles, provision of congestion-related information to drivers, management of construction and maintenance activities, and management of traffic for special events. In conjunction with the widening of I-235, the Iowa DOT implemented a freeway incident management system that includes a traffic management center (TMC), variable message signs, a Highway Advisory Radio station, a Highway Helper program, and video and communications equipment. The MPO's Transportation Management Advisory Committee (TMAC), a multi-disciplinary inter-agency group, provides coordination for the deployment and operation of the region's incident management plans and programs.

Intelligent Transportation System

ITS programs provide user services such as travel planning, traveler information, emergency management, and advanced vehicle control. Many of the activities associated with ITS also may fall into the Incident Management and Traffic Operational Improvements categories of the MTP. A Regional ITS Architecture was developed and the necessary infrastructure was put into place, prior to the reconstruction and widening of I-235. Currently, the Iowa DOT maintains an interactive traveler information website, where users can find updated information about traffic conditions on major travel corridors in the region. The TMAC provides coordination for the deployment and operation of the MPA's ITS programs. In 2006, the MPO programmed STP funds to assist in funding the Iowa DOT's TMC.

7.2 Capital Intensive Strategies

Lane Additions

Objective 3.2 of the MTP states that prior to consideration of capital improvements to alleviate congestion the MPO will consider the utilization of ITS and other operation improvements. However; when alternative methods are not feasible, adding through travel lanes has continued to be a widespread practice in the MPA for alleviating congestion and encouraging economic development.

Transit Capital Improvements

Transit capital improvements in the MPA mainly consist of the replacement of older buses in the DART fleet and procurement of additional buses for expanded DART services. Few, if any, roadway projects have been constructed with the intent of minimizing the impact of vehicle congestion for buses. No rapid transit services currently operate in the MPA. However, DART currently is studying the feasibility of BRT as part of the DART Forward 2035 Plan and is constructing a multimodal transit hub in the Des Moines CBD. As noted in Chapter 5 of the 2035 Metropolitan Transportation Plan, the MPO did commission a commuter rail feasibility study in 1999, which concluded the service was technically feasible, but economically impractical at that time.

Complete Streets

Ensuring that lane addition/widening projects consider integrating Complete Street practices in the design process can assist in congestion mitigation through providing additional opportunity for users to choose alternative modes of transportation.

8| Implementation and Management

Objectives in the CMP work in conjunction with the MTP to provide direction for future projects. Each of the objectives is tied to an issue of critical concern for the Des Moines region and addressing these issues is a priority. As part of the MTP update, being done as part of The Tomorrow Plan project, the goals and objectives of this document shall be integrated.

Management of the CMP is the responsibility of MPO staff while implementation will be done through the member entities.

9| Strategy Effectiveness

Objectives contained in the CMP all contain measurable criteria using data that is readily available. Utilizing readily available data reduces costs and maintains a level of familiarity for the purposes of continuity and stakeholder understanding. Each objective also includes a timeline as the CMP is considered a living document that will be updated periodically as necessary.

The monitoring process would include MPO staff producing an annual report on the status of the objectives in addition to the periodic updates of the document to add, remove or modify objectives on an as needed basis. The annual report will be presented to and evaluated by the MPO boards, local technical experts, and will be available to the general public on the MPO website.

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