

## CHAPTER 12

# CONGESTION MANAGEMENT PROCESS

### Introduction

The Congestion Management Process (CMP) is a systematic, data-driven, and regionally accepted approach that aims to improve the performance of the transportation network by mitigating congestion and ensuring the reliable movement of people and goods. The CMP evaluates congestion at a system-level and includes the identification, application, and evaluation of a number of strategies used to achieve regional congestion management objectives. The strategies and objectives addressed by the CMP are based upon a data-driven approach, which is shared and communicated throughout the region. It serves as a valuable tool to address the region's transportation system performance in a manner that prioritizes cost-effective and easy-to-implement solutions. The solutions and strategies identified as part of the CMP are ultimately implemented by the Metropolitan Council, MnDOT, transit providers and local governments as they select projects for funding and implementation and as they operate their systems.

A CMP is required for all Transportation Management Areas (TMAs) (metropolitan areas with a population exceeding 200,000). It is an on-going, continuous process that includes coordination and the sharing of data and information between regional stakeholders and partners. This defined process provides a framework for guiding the various activities of the Metropolitan Council, MnDOT, transit providers, and metro-area cities and counties to collectively make decisions aimed at increasing efficiency of the multimodal transportation system and reducing vehicle use by providing alternatives to driving alone. The CMP ensures that the key objective of mitigating congestion impacts is achieved and that congestion mitigation investments are properly monitored and evaluated. This interactive and on-going process of monitoring and evaluation of the impacts allows for the chosen strategies to be adjusted or eliminated over time should they not have the intended effect or another strategy proves to provide a better solution to mitigating congestion.

Given limited transportation resources, the existing transportation system must be managed and optimized to the greatest extent possible. Thus, the CMP prioritizes strategies that manage system demand, improve the operation of the existing system, and provide for multi-modal travel options. This vision is consistent with the overall goals of the 2040 Transportation Policy Plan of allocating limited resources to projects that provide the most system-wide benefit.

This chapter of the Transportation Policy Plan provides an overview of the region's Congestion Management Process and how it links to the investment decision-making within the region. In 2019 the Metropolitan Council produced an independent document that more fully detailed the regional Congestion Management Process and identified work tasks to be accomplished to improve the process. The stand-alone document, titled the Congestion Management Process Policies and Procedures document, was developed in cooperation with the Metropolitan Council's Congestion

Management Process Advisory Committee and reflects recent efforts to ensure the CMP more fully addresses the defined CMP network.

## Overview of the Congestion Management Process

The CMP is an ongoing process consisting of the following eight action steps:

1. Develop Regional Objectives for Congestion Management
2. Define the CMP Network
3. Develop Multimodal Performance Measures
4. Collect Data and Monitor System Performance
5. Analyze Congestion Problems and Needs
6. Identify and Assess Strategies
7. Program and Implement Strategies
8. Evaluate Strategy Effectiveness

This chapter is not intended to provide a detailed summary of the Metropolitan Council's approach and current status in regard to each of these actions. Rather, those are refined and expanded upon in the CMP Policies and Procedures document. Instead, what follows is an overview of the linkages between the TPP and CMP, a summary of recent CMP-related activities, and an outline of future activities and areas that need further refinement.

## TPP Framework for the Congestion Management Process

The Transportation System Vision and Performance-Based Planning chapter of the TPP Policies and Procedures document outlines a number of regional transportation goals and objectives that define the overall vision for the future of transportation within the metro area. While all of the goals relate in some manner to congestion management, the Access to Destinations goal (goal C) in particular provides a framework that tangibly connects the TPP with the Congestion Management Process. As described in the Policies and Procedures Strategies chapter, this goal strives to ensure that people and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond. The Congestion Management Process goes hand-in-hand with this goal, as the CMP is squarely aimed at ensuring the transportation system provides reliable, efficient, and multimodal connections throughout the region. Such connections greatly affect every resident of the region as they commute to work, travel to shopping centers, and perform other daily tasks.

Chapter 2, "Transportation Strategies," includes strategies or actions that the region and its transportation partners will use to work towards achieving the regional transportation goals and objectives. Many of the TPP strategies are linked to congestion mitigation related actions and will also be reflected in the strategies outlined in the Policies and Procedures document. In essence, the existing TPP strategies serve as the framework for defining the direction of the overall CMP and become the basis for the implementation of a coordinated regional approach to mitigating congestion.

A separate document was developed that better defines the objectives identified by the CMP Advisory Committee in more detail, and specifically structured these objectives using SMART (specific, measurable, agreed, realistic, and time-bound) performance-based planning approaches. However, a number of goals, objectives, and strategies outlined within the Transportation Policy Plan Strategies chapter of the Transportation Policy Plan reflect the overall vision and priorities of the region in regard to the Congestion Management Process. The following TPP objectives and strategies provide the basis for Congestion Management Process objectives and strategies that are further refined and reported upon in the CMP Policies and Procedures document:

1. Goal C, Objective A: Increase the availability of multimodal travel options, especially in congested highway corridors
2. Goal C, Objective B: Increase travel time reliability and predictability for travel on highway and transit systems
3. Goal C, Objective D: Mode share: increase transit ridership and the share of trips taken using transit, bicycling, and walking
4. Strategy C5: Initiate travel demand alternatives that reduce the number of single-occupancy vehicles travelling in the region, specifically by supporting the adoption and implementation of MnPASS lanes and transit advantages that support faster, more reliable alternatives along congested highway corridors
5. Strategy C7: Manage and optimize the performance of the principal arterial system as measured by person throughput
6. Strategy C9: support investments in A-minor arterials that build, manage, or improve the system's ability to supplement the capacity of the principal arterial system and support access to the region's job, activity, and industrial and manufacturing concentrations
7. Strategy C10: Manage access to principal and A-minor arterials to preserve and enhance their safety and capacity
8. Strategy C12: Invest in an expanded network of transitways, including bus-rapid transit, light rail, and commuter rail
9. Strategy C15: Focus investments on completing priority Regional Bicycle Transportation Network alignments and eliminating system gaps
10. Strategy D5: Identify the impacts of highway congestion on freight movement and identify cost-effective mitigation

## Recent Council Activities that Support the Process

Based upon guidance from the Federal Highway Administration (FHWA) and the Metropolitan Council's ongoing mission to improve the congestion management process, the Metropolitan Council has performed the following activities that support the CMP. The following pages highlight some of the recent and on-going efforts undertaken by the Metropolitan Council that directly benefit the Congestion Management Process.

## Peer Review of the Council’s Congestion Management Process

As part of the 2016 Transportation Management Area Planning Certification Review, the USDOT proposed a work plan to assist the Metropolitan Council in improving the Congestion Management Process. The work plan included a peer exchange, hosted by the FHWA and the Metropolitan Council in May 2017. This peer exchange included Congestion Management Process experts from MPOs in St. Louis, Portland, Salt Lake City, and Wilmington (Delaware). The peer exchange provided a number of representative “best practices” from across the country and allowed Metropolitan Council staff to better understand how other TMAs are approaching the Congestion Management Process. In particular, the peer exchange addressed the following items:

- Performance measures used by peer regions to both identify congested corridors and measure whether the implemented projects led to congestion improvement
- Investment strategies that peer regions have used to help mitigate congestion on key corridors
- Data collection processes and potential sources for key datasets
- Congestion management strategies and the process in which they were developed
- Methods for implementing congestion management strategies to prioritize projects for funding

This peer exchange was particularly useful in providing a number of specific methods for developing a fully realized CMP for the Twin Cities metro area. A clear message from the exchange is that there are a number of ways in which a region may successfully implement a CMP; that is, it must be specific to the region and developed with extensive input from regional stakeholders. In particular, Metropolitan Council staff and stakeholders were introduced to examples of visualization techniques that graphically depict congestion in a manner which is easily digested and understood by policymakers and the public. Over time, these techniques may develop into a “dashboard,” which could be produced annually and used to track the performance of key congestion indicators from year-to-year. Other key take-aways from the peer exchange include an understanding of how peer regions are incorporating CMP strategies into the project programming process; key data sets that can be utilized to define, measure, and track congestion; and a number of examples of multimodal performance measures that have been utilized by other regions.

## Establishment of the Congestion Management Process Advisory Committee

Based in part on the peer exchange and in order to comply with federal requirements, the Metropolitan Council established a Congestion Management Process Advisory Committee in 2017. This committee is comprised of technical experts and other stakeholders representing the entire metropolitan planning area. The committee will ensure the Metropolitan Council is developing CMP objectives that represent the goals and priorities of the region and serve as a critical resource for:

- Identifying corridors of concern
- Defining the regional CMP network
- Steering the direction of regional performance measures

- Developing a regional data collection and sharing program
- Developing specific CMP strategies

The CMP Advisory Committee was instrumental in the development of the CMP Policies and Procedures document and was provided with regular updates to provide feedback. In addition, and consistent to the Metropolitan Council's vision and federal requirements, the CMP Advisory Committee serves as the body that guides the region's Congestion Management Process long-term. The committee continues to meet regularly to direct the CMP and carry out various roles relative to implementing the strategies as well as recalibrating and adjusting existing strategies to meet the region's CMP objectives.

## Defining the Congestion Management Process Network

As the MPO for the Twin Cities metropolitan area, the Metropolitan Council evaluates the transportation network within the Metropolitan Planning Area Boundary. This boundary includes the seven metropolitan area counties as well as parts of Sherburne and Wright counties. Per guidance from the CMP Advisory Committee, the Metropolitan Council included all principal arterials and A-minor arterials in the region in the CMP network. The A-minor arterial network is primarily operated and maintained by the counties, who are responsible for 70% of the total A-minor network. MnDOT and individual cities are responsible for 20% and 10% of the A-minor network, respectively.

The Metropolitan Council's model network extends beyond this boundary to include several counties outside of the 7-county region. An expanded model network allows for a more accurate analysis of the metro area's transportation system. This network provides the base foundation from which further analyses of transportation facilities are performed in order to identify corridors that comprise the CMP network.

The Metropolitan Council, in cooperation with MnDOT, has performed several analyses on the region's principal arterial system. The freeway portions of this system is generally covered by the Regional Transportation Management Center, which utilizes a number of traffic control and intelligent transportation system devices. While the freeway portion of the principal arterial system is well-defined, the minor arterial system has not been examined in as great of detail. This is a significant gap in the Metropolitan Council's efforts to define the conditions of the regional CMP network. In order to address this gap, the Metropolitan Council has committed to a number of initiatives to identify the existing conditions and congestion on the A-minor arterial system, including the following:

- The use of a pilot StreetLight InSight subscription to measure peak-hour and free-flow speeds on the non-MnDOT A-minor network. This effort utilizes the same methodology developed by MnDOT Metro District to define congestion on the MnDOT-owned minor arterial system. The analysis provides a much more thorough understanding of the entire metro area network and provides the Metropolitan Council the ability to allocate resources to address the identified problem areas. This analysis is also being used as a scoring measure to help select projects in the Regional Solicitation to receive federal flexible funding.

- The Metropolitan Council programmed 2018 federal planning funds for the CMP Policies and Procedures document and listed this effort in the approved Unified Planning Work Program. The Policies and Procedures document includes analyses to identify problem areas and congested corridors along the locally-owned system.
- In cooperation with the CMP Advisory Committee, the Metropolitan Council will work with regional experts to establish a metro-wide subset of high-priority roadway corridors. These corridors will be evaluated in greater detail and identified as CMP corridors.

## Performance-Based Planning Program Efforts

The strategic vision of the Metropolitan Council, as outlined in this Transportation Policy Plan, includes a number of strategies aimed at reducing vehicle miles travelled during peak periods and improving accessibility to areas with a high concentration of jobs. A specific work plan for implementing these strategies, however, has not yet been developed. In order to provide greater clarity to how the strategies are articulated through the planning and programming processes, the Metropolitan Council's CMP Policies and Procedures document accomplishes the following:

- Develop performance measures to define the three major dimensions of congestion; that is the intensity, duration, and extent of congestion; variability of congestion is developed only for the National Highway System (NHS) roadways
- Further refine regional strategies to reduce vehicle miles traveled during peak commuting hours, and improve connections between areas with high concentrations of jobs and low-income households
- Identify programs and services that support access to jobs within the region
- Identify projects and programs that mitigate congestion to the greatest extent feasible and increase accessibility to jobs

These efforts will be formalized in the continuing development of a series of multimodal performance measures and targets, as well as a formal data collection and sharing plan. These performance measures will be used to:

- Track progress towards meeting regional congestion-related objectives
- Identify specific corridors which require additional data collection and analytical efforts
- Assess congestion mitigation strategies, programs, and projects
- Better communicate system performance using visualization techniques that are understandable to policy makers, the public, and the Metropolitan Council's partner agencies

All of the performance measures under development will meet federal requirements, local priorities, and utilize a "SMART" approach to performance-based planning. These measures, in turn, will be used to evaluate the performance of the Metropolitan Council's investment strategies towards meeting regional goals. These strategies will be integrated into the CMP and the connection between these strategies and the planning and programming processes will be made more transparent.



The Metropolitan Council has historically tracked a number of performance measures that are related to system congestion and reliability. These were reported, in part, in previous iterations of the TPP and in the Metropolitan Council's Transportation System Performance Evaluation, the latest version completed in 2020. While the Metropolitan Council intends to continue to track many of these measures, all previous performance measures will be evaluated and vetted through the CMP Advisory Committee, and, if selected, evolve into CMP objectives using a SMART approach. The CMP Policies and Procedures document outlined these new performance measures, which will continue to be tracked, monitored, and reported upon on a regular basis.

Pursuant to the performance-based planning legislation established in the Moving Ahead for Progress in the 21st Century (MAP-21) and Fixing America's Surface Transportation (FAST) acts, the Metropolitan Council has been working with MnDOT and regional stakeholders to establish short-term regional performance targets for the federally-mandated congestion-related performance measures. State-wide targets were established by MnDOT by May 20, 2018. The Metropolitan Council had 180 days after the adoption of the MnDOT targets to either support the targets to establish different targets for the metro area. [Targets adopted by the Metropolitan Council are reported in chapter 13: Performance Outcomes](#). The following performance measures require 2 and/or 4-year targets:

- Travel time reliability on the Interstate and non-Interstate National Highway System (NHS). Defined as the ratio of longer travel times (80th percentile) to a "normal" travel time (50th percentile). This is measured as the percent of person-miles travelled that are reliable.
- The percent of interstate system mileage providing for reliable truck travel time.
- Peak hour excessive delay. This will be measured by the annual hour of peak hour excessive delay per capita on the NHS. Per federal rules, the threshold for excessive delay will be travel time which is below 20 miles per hour or 60% of the posted speed limit, whichever is greater, during peak travel times.
- Non-single occupancy vehicle (SOV) travel. This measure will be used to set a target for the percent of travel within the region which does not utilize single-occupancy vehicles.

## Recent Studies and Ongoing Strategies that Support the Congestion Management Process

### CMSP IV Study

The Congestion Management Safety Plan 4 (CMSP 4), completed in 2017, is a funding program that addresses congestion and safety concerns through a process and criteria which identifies and prioritizes lower-cost/high-benefit highway construction projects on the MnDOT Metro District highway system. The CMSP 4 is the fourth iteration of CMSP process, and includes a number of refinements based upon an extensive before and after analysis of the effectiveness of previously-implemented solutions. The solutions identified in the CMSP are typically lower in cost and smaller in scope than traditional highway capacity expansion investments, and can be delivered quickly, simply, and with less disruption to traffic along the corridor.

Phase 4 of the CMSP reflects the changes to the MnDOT Metro District highway system over recent years. It includes travel time reliability, the variability of travel time for system users, as key performance measures for evaluating projects. The CMSP 4 recommended, in particular, that the Metropolitan Council focus more attention on potential projects on non-freeway routes to take pressure off the principal arterial system. This coincides with continuing efforts to gain more rigorous data and better understand congestion patterns on the A-minor arterial system.

### **Principal Arterial Intersection Conversion Study**

This study, completed in February of 2017, examined over 370 intersections along the region's non-freeway principal arterial network in order to determine those that are the highest priority for potential grade-separation projects. Of all the intersections, a selection of 91 at-grade intersections were identified and subsequently classified into three tiers – high, medium, and low – for investment prioritization. The identified intersections, and in particular the 34 high-priority intersections, will be incorporated into the Metropolitan Council's transportation planning and programming efforts. Additional information on this study is included in the Highways chapter of this document.

The results of this study directly support the CMP by providing a region-wide analysis of interchange conversions that would have the greatest positive impact on relieving system congestion. The intersection priorities have been incorporated as a scoring criterion for the Regional Solicitation and will support other MnDOT and Metropolitan Council funding programs.

### **MnPASS System Study Phase 3**

The MnPASS System Study Phase 3 is a study which outlines the region's MnPASS system vision and determines a prioritized list of corridors for which to incorporate MnPASS lanes. It examines person throughput, travel-time reliability, vehicle speed, VMT, and the cost/benefit analysis of potential MnPASS lane construction, in order to identify the corridors that would benefit the region most.

The MnPASS System Study directly supports the Metropolitan Council's CMP efforts by promoting high-occupancy vehicle travel; reducing congestion during peak travel periods; and incorporating greater reliability into the regional transportation network. MnPASS provides a more reliable alternative to congested travel for transit, high-occupancy vehicles, and those willing to pay.

### **Travel Behavior Inventory**

The Travel Behavior Inventory is a program of travel behavior research and transportation model improvement. The program includes a biennial regional household travel survey, which will enable tracking of person-based performance measures, including mode share. Future improvements to the regional model will be targeted to improve the ability to forecast key CMP performance measures.

### **Highway Systems Management**

Highway systems management (freeway management system) is a broad term used to describe the infrastructure and traffic operation technologies that are used to improve mobility and reduce



congestion within the metro area. A freeway management system and an arterial traffic management system are important to achieving the most safety and mobility benefits for users from the large capital investments agencies have made in highways.

A freeway management system can include monitoring traffic conditions, relaying real-time information to travelers and more direct action on the efficiency of highways. Monitoring of traffic is often done through cameras and various types of automated measurement tools. Providing real time information to travelers can be done through dynamic signs, websites and in-vehicle alerts. Directly acting to improve the efficiency of highways can be accomplished through tools such as ramp meters, emergency response capabilities, coordinating information and activities with various emergency responders, and through planning work zone activities with traffic demands in mind.

An arterial traffic management system might use similar monitoring of traffic conditions and relaying of real-time information to travelers however the direct actions that can aid efficiency differ in some ways. Similarly work zone planning, emergency response and coordinating with first responders can be effective but coordinating traffic signals is fundamental on arterials. The newest technologies support constant monitoring and almost constant updates to signal timing for maximum efficiency at all times.

## 2018 Regional Solicitation

Specific changes were made to the 2018 Regional Solicitation that further the existing CMP include the following:

- Integrated the results of regional prioritization efforts into the project scoring including the following:
  - Principal Arterial Intersection Conversion Study
  - Congestion Management and Safety Plan IV
  - Highway Truck Corridor Study
- Increased the maximum federal award for Travel Demand Management (TDM) projects to enhance the potential impact of these investments
- Evaluated projects using Streetlight InSight's speed data to measure congestion levels on the non-freeway principal arterial and A-minor arterial networks

All of the aforementioned studies and strategies illustrate a regional, systematic, and data-driven approach in cooperatively assessing the region's needs and collectively coordinating on areas of the transportation system with significant mobility issues. In short, these studies and strategies directly support the Congestion Management Process, and their outcomes and recommendations were incorporated into the CMP Policies and Procedures document by assisting in defining the CMP network, developing regional objectives, and ultimately utilized in programming and implementing projects which support the region's CMP strategies.

## Next Steps and Future Council-Led Activities

As previously noted, this chapter of the Transportation Policy Plan provides a broad overview of some of the CMP-related activities the Metropolitan Council performs, while simultaneously outlining the

current short-comings and how these were addressed. While much of this was determined cooperatively with regional partners through the CMP Advisory Committee, other improvements were developed internally and communicated with greater transparency and detail in both the Congestion Management Process (CMP) Policies and Procedures document and other future documents. Outlined below are the specific steps the Metropolitan Council will take over the course of 2018-2020 to develop a more comprehensive and robust Congestion Management Process.

## **Develop a Regional Definition of Congestion**

Presently, there is no universally agreed-upon definition for congestion within the metro area. Both the Metropolitan Council and MnDOT have typically defined congestion as peak travel time speeds that are either less than 45 miles-per-hour or 60% or less than the posted speed limit on the freeway system. However, other congestion measures have been used in various reports and studies performed by the Metropolitan Council and by MnDOT. While all of these measures are appropriate and valid mechanisms for measuring congestion, it is essential that the region mutually agree to and define a universal methodology for defining congestion within the entire Twin Cities metro area. The definition of congestion will likely differ based upon the context and the unique operating characteristics of the roadway; for example, the threshold for congestion will be different for a freeway compared to an A-minor arterial. While no one measure is perfect, the Metropolitan Council and its stakeholders must agree to a congestion measure that is appropriate for the unique context of the region.

By jointly agreeing to a regional definition of congestion, the Metropolitan Council and its regional partners will be able to evaluate the entire roadway system in a universal manner and gain a true understanding of priority corridors. This will allow the region to agree upon what is “unacceptable congestion” and set appropriate objectives to mitigate congestion in key corridors. This will be a key item of the CMP Advisory Committee in 2020 and 2021.

## **Develop Regional Congestion Performance Measures**

Previous iterations of the TPP have outlined a number of performance measures the Metropolitan Council proposed using in order to identify congested corridors and monitor system performance. Many of these were developed prior to MAP-21 guidance, which provides specific congestion performance measures. Due to the release of the final rule regarding congestion performance measures and the inconsistent use of proposed congestion-related performance measures, the Metropolitan Council has worked in conjunction with the CMP Advisory Committee to develop regional multimodal CMP performance measures..

The performance measures:

- Are based on SMART objectives
- Address the four dimensions of congestion (as described in the Performance-Based Planning Program Efforts section of this chapter)
- Focus on the movement of persons and goods instead of vehicles

- Are selected based on their ability to effectively communicate system performance to the Metropolitan Council's stakeholders and the public

The initial performance measures for defining congestion throughout the region are included within the CMP Policies and Procedures document. These will continue to be refined over the latter half of 2020 as speed-based data is refined and brought forth to the CMP Advisory Committee.

## **Assess Congestion Management Process Strategies**

In order to more effectively manage congestion and optimize solutions, the Metropolitan Council needs to more thoroughly evaluate whether the region's CMP strategies have had the intended positive impact on congestion. This includes an analysis of not only project-level impacts of strategies, but also an evaluation of whether alternative strategies could have had a greater impact and/or a better benefit-to-cost ratio. The Metropolitan Council, via the Congestion Management Process and associated Policies and Procedures document, developed a data-driven mechanism to quantify and better assess strategy effectiveness. The Metropolitan Council also recognizes that the CMP strategies need to be more effectively communicated with regional stakeholders and the public, which will be accomplished via the CMP Advisory Committee and CMP documents.

## **Integrating Congestion Management Process Activities into the Project Prioritization and Selection Processes**

While the Metropolitan Council has traditionally integrated congestion into the project selection process, more transparency is needed to show how the CMP factors into project selection. The Metropolitan Council recently included a number of criteria that will specifically prioritize projects with CMP-elements within the 2018 Regional Solicitation update. The specific linkage between projects that directly support congestion mitigation and how these are integrated into the overall programming process is not expressly defined at present. This will be a key topic to be addressed in detail in a future CMP documentation and will be a priority issue to be discussed with the CMP Advisory Committee.