8. Management Systems

Former federal transportation law mandated metropolitan areas over 200,000 population to implement various management systems in conjunction with the Michigan Department of Transportation (MDOT). These transportation management systems include: congestion, pavement, bridge, safety, intermodal and public transportation. The National Highway System Act of 1996 rescinded those broader mandates, but retained a requirement for an approved Congestion Management System (CMS) in Transportation Management Areas (TMA). Lansing/East Lansing and the entire Tri-County region is a TMA, since the region's population exceeds 200,000. In a TMA, no highway project that increases capacity for single occupant vehicles (SOV) can be constructed unless drawn from an approved CMS. This requirement was retained in TEA-21 and SAFETEA-LU legislation, which changed the name of the Congestion Management "System" to a Congestion Management "Process".

Congestion Management

TCRPC adopted an approved Congestion Management process document in March 2004, which is incorporated herein by reference.

The earlier approved CM process was derived from the Regional 2025 Transportation Plan and results of the **"Regional Growth: Choices for Our Future"** project and is available under separate cover.

The approved CM process document:

- defines congestion;
- describes TCRPC's congestion management process;
- evaluates causes of congestion;
- identifies and evaluates congestion mitigation strategies;
- describes a process for analysis of congested corridors;
- identities responsibilities and division of labor for how these analyses will be conducted;
- identifies extent and severity of current and future congestion by roadway location;
- identifies and evaluates (by time of day) specific alternatives considered to address those congested locations;
- identifies strategies which should be considered for implementation;
- outlines funding sources available to address congestion;
- documents an implementation plan for the CM process; and
- summarizes relationships between the adopted transportation plan, the adopted transportation improvement program and the approved CM process.

In air quality non-attainment areas, federal requirements include, in subpart c:

"(c) In a TMA designated as nonattainment for carbon monoxide and/or ozone, the CMS shall provide an appropriate analysis of all reasonable (including multimodal)

travel demand reduction and operational management strategies for the corridor in which a project that will result in a significant increase in capacity for SOVs (adding general purpose lanes to an existing highway or constructing a new highway) is proposed. If the analysis demonstrates that travel demand reduction and operational management strategies cannot fully satisfy the need for additional capacity in the corridor and additional SOV capacity is warranted, then the CMS shall identify all reasonable strategies to manage the SOV facility effectively (or to facilitate its management in the future). Other travel demand reduction and operational management strategies appropriate for the corridor, but not appropriate for incorporation into the SOV facility itself shall also be identified through the CMS. All identified reasonable travel demand reduction and operational management strategies shall be incorporated into the SOV project or committed to by the State and MPO for implementation."

The CM document also provided analysis of travel demand and operational management strategies, identified those reasonable to consider for implementation, identified the process by which those would be considered for all roadway capacity projects in the Regional 2025 Transportation Plan and provides a basis for local project sponsors to document implementation of the CM process through the project programming process. Portions of those tables used to document this process are now being updated by various maps and tables in this Regional 2035 Transportation.

The document further identifies the adopted "Wise Growth" land use alternative as the region's primary congestion management strategy, along with ancillary supporting strategies like access management and traffic impact studies in congested corridors. It also identifies an integrated approach to land use and transportation system management and operations as the region's second highest priority for congestion management and analyzes and identifies other strategies for managing congestion in the Tri-County region.

An important part of that analysis is based on modeling of transportation network alternatives evaluated in the Regional Transportation Plan, as discussed in detail in Chapter 11 and summarized below, which are being updated in this current plan.

As part of this Regional 2035 Transportation Plan TCRPC evaluated eight different transportation networks based on alternative assumptions or approaches to address regional transportation problems. Examples of these network alternatives include high and medium levels of transit system improvements, a management and operations/demand reduction option, an unconstrained "highways only" solution and a financially constrained highway project solution. Various combinations or "packages" of these alternatives were also evaluated.

After this analysis in earlier plans, the Commission adopted an alternative package which included a set of strategically applied "medium" transit system improvements, the management and operations/demand reduction option, the financially constrained road project list and the "Wise Growth" land use alternative identified by the **"Regional Growth: Choices for Our Future"** project. A similar analysis was completed during preparation of this plan update as adopted by the Commission.

This network alternatives analysis was further integrated in the region's CM process. Results of this network alternative analysis are shown in Chapter 11. By agreement between TCRPC, MDOT and FHWA staff, due in part to the short turn around time for completing the Regional 2030 Transportation Plan, TCRPC did not update this analysis in that document. Instead, the alternative adopted in the Regional 2025 Transportation Plan was re-modeled for 2030 and shown along side results from that earlier analysis for comparison purposes. The existing alternatives analysis model runs remained in place for use in the TCRPC CM process until this Regional 2035 Transportation Plan is completed. That analysis has been updated as part of this plan.

Results of comparative network alternative analysis in Chapter 11 of this document now replaces those previously integrated in the old document.

Additionally, new deficiency analysis model runs for 2010 and 2035 (discussed in Chapter 10) also provide an updated snapshot of extent and duration of congestion. Details from these model runs may be used to demonstrate projects in this plan through the 2035 period (or any future amendments) are being drawn from the approved CM process. Project sponsors and other interested parties are urged to contact TCRPC staff with questions concerning how figures from these model runs should be applied through the approved CM process.

The remainder of this section summarizes components of the approved regional CM process. Readers are referred to the detailed CM document or to TCRPC staff for specific information pertaining to the process, or outcomes of that process and how it is being implemented.

CM Implementation Plan Status

The adopted CM document identified an implementation plan and milestones for measuring TCRPC's implementation of the CM process. Since the CM process was approved in March, 2004, about 69 months have passed between approval and action on this Regional 2035 Transportation Plan. It is significant to note the TCRPC has met and achieved eight of the first 11 milestones identified for completion within three years after approval of the CMS document and another is an ongoing continuous activity in progress. In addition, six of the first ten milestones for implementation in the 4-10 year time period are also complete and several local corridor studies have been completed are in process.

TCRPC is right on target with the approved CM implementation plan and in addressing all applicable CM requirements.

MDOT CM Process

MDOT's Congestion Management process is designed to monitor and analyze the magnitude of congestion on the multi-modal transportation system, plan actions appropriate to the scope of the problem, implement projects that reduce congestion and enhance transportation system performance.

MDOT monitors potential need for added capacity on the state trunkline system through two processes. First, MDOT monitors overall operation of roads using average daily, peak hour and commercial traffic monitoring, crash data and system condition to identify current deficiencies. Travel demand forecasting models assess future system deficiencies based on population and development trends. Second, MDOT receives direct input from the traveling public, local units of government, legislators acting for constituents and private sector developers whose plans impact existing roadways.

These inputs are analyzed against actual system operation. If priority deficiencies are identified, results of the analysis move forward in the project development process. Priority deficiencies include those in corridors of highest significance and National Highway System (NHS) routes. Corridor and freeway studies are conducted to determine severity and extent of capacity deficiencies on existing highways. The studies develop potential alternatives and coordinate connectivity, intermodal and capacity improvements with pavement and structure rehabilitation. Actions to be considered include changes in the transportation system by:

1. using Intelligent Transportation Systems (ITS);
2. changing characteristics of demand; and
3. providing added capacity.

ITS tools are explored before major capital investments or widening to improve capacity and safety on the transportation system. Changing characteristics of demand can include actions such as flexible work hours to reduce peak flow or actions to increase public transit use or ridesharing. If no action is taken to alleviate congestion, considerable delays impede movement of persons and goods along Michigan's highway system.

MDOT's congestion management strategy is consistent with this Regional 2035 Transportation Plan. MDOT strategy places priority on the freeway system to meet traffic forecast needs to the year 2030. Elements for consideration include interchange reconstruction, right-of-way requirements, environmental impacts and cost of disruption to traffic or business during construction.

Congestion Baseline

MDOT's Michigan Transportation Plan: Moving Michigan Forward provided detailed information about current and projected traffic trends on trunklines. To summarize, state trunkline annual vehicles miles traveled (AVMT) under congested conditions is projected to grow 12 percent from 2004 to 55 percent in 2030. For urban freeways, AVMT under congested conditions is projected to grow to 30 percent of urban freeway AVMT at or near congested by 2030. For the MDOT University Region the backlog of congested expansion lane miles needed is projected to increase from 423 in 2005, to 562 by 2030, nearly a 33 percent increase.

Whether along corridors of highest significance or other state trunkline highways, MDOT's strategy for congestion management includes working on an inventory of corridor strengths

and deficiencies for infrastructure development, building a sense of common interest along the corridor, creating a forum that fosters economic development opportunities, pursuing physical transportation improvements/enhancements and facilitating international trade.

Strategy for corridors of highest significance include discussion about need to add capacity lanes along identified corridors.

To address additional capacity needs along the corridors of highest significance, a variety of approaches will be used, according to corridor characteristics. Some freeway corridors will need additional lanes along their entire length. Other freeway corridors will need additional lanes only in urbanized areas. To address capacity needs along non-freeway corridors or segments of corridors, lanes may be added, passing relief lanes may be added or access management may be used to preserve and enhance existing capacity.

These critical priorities will be established in MDOT Region plans, or corridor plans for corridors of higher significance. These plans will be developed based on goals, objectives and strategies contained in the State Long Range Plan: 2005 - 2030.

Additional Strategies

MDOT and TCRPC's congestion management strategy aims to enhance mobility, a component of the long range plan goal of basic mobility. Additional strategies related to mobility follow.

Freeway Modernization

MDOT's freeway modernization strategy is a continuing commitment to apply up-to-date design standards and new technology when rebuilding freeway facilities or designing new facilities. The transportation industry is continually refining design standards and developing new technology for all facility types. These standards encompass a broad range of design elements including pavement type and thickness, structural elements of bridges, configuration of interchanges and traffic volumes. It also includes application of new technology such as weigh-in-motion programs for commercial traffic and Intelligent Transportation Systems (ITS) applications, such as changeable message signs, video monitoring of freeways for incidents and ramp metering to help maintain steady rates of traffic flow at interchanges.

Access Management

Access management is a coordinated development plan and review process requiring a cooperative effort between MDOT and local government agencies to manage access to land development, while simultaneously preserving flow of traffic--mobility--on the surrounding road system. In many instances, capacity and safety concerns can be alleviated through a local program of highway-land use access management. TCRPC also has a long history of encouraging access management. Staff developed a model zoning ordinance for access management in the early 1980's which has been integrated in several

local jurisdiction's zoning ordinances. TCRPC and MDOT provide technical assistance to local governments in developing access management plans or ordinances in the region.

A recent example includes an access management overlay zone ordinance approved by six jurisdictions on the M-43 corridor from Park Lake Road to M-52 and south on M-52 to I-96.

Interchange Strategy

Improvements to existing interchanges and construction of new interchanges present special needs for state and local coordination. Interchange projects are selected in response to traffic needs on a statewide priority basis and require local coordination and a concurrent local commitment to widen local roads as necessary. Local authorities may choose to widen local roads at an interchange to attract development, even though current traffic volumes do not warrant such improvement. Such improvements may also require improvements to state highway interchange ramps. Interchange improvements prompted by locally encouraged and approved developments are the financial responsibility of local authorities and require coordination with MDOT. Local agencies and/or private sector developers are responsible for all costs associated with a new interchange necessitated by private sector development, including grade separation structures, right-of-way improvements and approach work. An exception to this policy is granted in cases where MDOT has determined that reduction in existing congestion at adjacent trunkline interchanges can be reasonably expected and where FHWA justification criteria warrant an additional break in access. In such cases, MDOT may assume costs for structures and ramps only. Costs associated with local roadway work outside of bridge abutments, including right-of-way costs, remain the responsibility of the local agency.

Intelligent Transportation Systems Strategy

MDOT has been at the national forefront in planning, developing and deploying Intelligent Transportation Systems (ITS) technologies to address transportation and safety issues. ITS is being integrated in MDOT's overall transportation planning process. The process of blending high technology into solutions to transportation problems in an intermodal context is already occurring. Ongoing partnerships with the University of Michigan and Michigan State University support research and evaluation efforts to identify promising statewide uses for ITS technology throughout the State. MDOT, with support from FHWA, has also initiated a unique ITS test bed in Michigan. The program offers an opportunity to private industry to partner with MDOT in testing products, services, concepts and research in Michigan. With support from MDOT, the Tri-County region developed a regional architecture for ITS applications. Additional information on this architecture and the regional ITS strategy is contained in Chapter 13.

Safety Strategies

MDOT has two specific safety strategies for highways – a trunkline safety strategy and a highway/railroad grade crossing hazard elimination strategy. MDOT is committed to

proactively maximizing safety aspects inherent in all projects, from conventional rehabilitation to major reconstruction. This will be achieved by:

1. continuously monitoring crash patterns;

2. maintaining MDOT's role as a recognized leader and innovator (both nationally and in state) in traffic safety research, hazard elimination and other safety projects;

3. integrating safety in transportation planning at all levels; and

4. integrating safety in roadway project design.

In addition, MDOT will continue funding improvements to trunkline roadways with higher than expected crash patterns. MDOT is committed to improving safety at highway/railroad grade crossings in an effective and cost-efficient manner.

Role of MPO's in Management Systems

Metropolitan Planning Organizations (MPOs) play a role implementing management systems, congestion management strategies and in identification and prioritization of needed freeway improvements in their areas. This process is required by MDOT and FHWA. Any state trunkline project in a metropolitan area must be identified in the MPO long-range plan and must have MPO approval to receive federal funds. Projects located in MPO areas and slated to have federal funds cannot go beyond the planning stage without concurrence of the MPO. MDOT projects funded in the Tri-County region are shown in Chapter 13.

TCRPC's Congestion Management System

TCRPC and MDOT cooperatively developed the region's Congestion Management process and participated extensively in its design and beta testing as reported in the 1995 Regional 2015 Transportation Plan. TCRPC staff also participated on the design team for the Safety Management System.

Monitoring and Forecasting

As noted, congestion monitoring is done using traffic volume, crash and condition data and public input. TCRPC maintains a traffic count monitoring system for traffic volume data collected by MDOT and all local road agencies or governments. This electronic database is regularly updated and contains traffic volume data since 1973 for nearly 3,500 locations throughout the region. This database has been integrated with the CM database at MDOT and the regional traffic forecasting model. TCRPC and MDOT have a joint memorandum of understanding in place concerning the travel forecasting model, which covers the entire Tri-County region. Information concerning the model used to develop this Regional 2035 Transportation Plan is in Chapter 9. Model runs are also integrated in the CM database maintained by MDOT. In addition to these monitoring and forecasting elements, TCRPC's Congestion Management process includes the following strategies.

Land Use Strategy

TCRPC's primary strategy to address congestion throughout the region is land use based. The primary element of this land use strategy is implementing the adopted "Wise Growth" scenario, the regional land use vision developed through the **"Regional Growth: Choices for Our Future"** project. As noted, implementing this strategy reduces congested lane miles to nearly half of what would otherwise occur at regional build out under densities permitted by current zoning. Implementing this strategy has been integrated in project selection criteria in various program categories in Chapter 13.

Additional land use support strategies include access management and traffic impact studies in congested corridors prior to capacity expansions. As noted, TCRPC and MDOT cooperatively work to provide technical assistance to local governments concerning access management. In addition, TCRPC and MDOT cooperatively developed the guidebook Evaluating Traffic Impact Studies as a recommended standard of practice for Michigan communities. TCRPC has distributed over 10,000 copies of this guidebook, now available as a compact disk and on the TCRPC web site. Numerous local communities have integrated its model ordinance in local plans and ordinances.

Management and Operations Strategies

TCRPC's Congestion Management System also includes a "Management and Operations" component, which is further discussed in Chapters 10, 11 and 13. TCRPC has created a standing Management and Operations Task Force, which also developed the regional ITS architecture, with support and assistance from MDOT. TCRPC's Management and Operations strategy represents a combination of integration of ITS with land use, travel demand management, traditional traffic engineering measures and other techniques to improve operations in priority corridors for all modal users, while integrating land use considerations with traffic management and operations from "building facade to building facade."

Alternative Modes Strategies

TCRPC's comprehensive support of transit and non-motorized planning activities on a regionwide basis integrates alternate modal considerations in priority corridors throughout the region. In addition, TCRPC has extensively trained local officials in techniques to improve walkability, livability, traffic calming and pedestrian or bicycle treatments throughout the region and in congested corridors. The approach is to thoroughly integrate transit, bicycling and pedestrian treatments with land use and management/operations considerations in the transportation planning process and is a significant component of TCRPC's Congestion Management process.

Wide Nodes/Narrow Roads and Traffic Calming Strategy

This strategy is integrated with and supportive of other congestion management elements and strategies above. It recognizes importance of considering techniques like intersection

treatments, such as turning lanes or roundabouts, to improve choke points or restrictions in major corridors (which typically occur at intersections) and to reduce delay, before consideration of major roadway widenings. The result is a system of "widened nodes" (intersections) and "narrow roads." Where appropriate, traffic calming techniques, and even "road diets" (such as removing a through lane and adding center left turn lanes and/or bicycle/pedestrian treatments) may also be considered to improve quality of flow at reduced speeds, in combination with widening nodes, which collectively may provide for greater person throughput in a given corridor at safer, lower speeds. This strategy has already been applied on M-43 Grand River and Burcham Road in East Lansing. Numerous examples of other traffic calming techniques are now in place throughout Lansing, East Lansing, MSU and other communities regionwide. Examples of intersection treatments or widened nodes are in place throughout the region. Turn lanes, channelizations or other traditional treatments have been routinely used for decades. Modern roundabouts, widely used throughout Europe, Australia and many other states are a relatively new concept in the region, but have recently been constructed in Dimondale and Meridian Township. Numerous others are under active consideration at MSU, Ingham County, Delta Township, Lansing and other locations regionwide.

These and other types of "wide nodes/narrow road" concepts are routinely considered as part of a comprehensive approach to integrating land use, management and operations, ITS and other techniques as alternatives to major widenings or system expansion. As such, this technique is an important component of the region's Congestion Management process.

Investment Strategies

Consistent with the agreed on planning process, TCRPC and MDOT cooperatively identified twenty and five year investment strategies for 25 categories of programs and projects contained in Chapter 13. These strategies have been extensively reviewed by advisory committees and the general public as part of the **"Regional Growth: Choices for Our Future"** project and were originally adopted in the Regional 2025 Transportation Plan. Some limited refinements to those strategies were made with their re-endorsement and adoption the Regional 2030 Transportation Plan and this Regional 2035 Transportation Plan. As adopted in this plan, along with other elements described above, these strategies collectively are an integral part of the region's Congestion Management process. As such, they are part of (along with other elements identified earlier) an integrated approach to implementing the agreed planning process and the "approved" Congestion Management process required by federal law from which future capacity improvement projects are drawn. Capacity improvement projects in this plan have been broadly and generally drawn from this approved process, consistent with the region's approach to implementing Congestion Management process requirements. Future plan updates will continue to report on progress in implementing the approved CM process for the region.

Performance Measures

The following table lists approved performance measures for TCRPC's and MDOT's Congestion Management process in the Lansing-East Lansing metropolitan area. While

data for some of these measures exist, others, such as delay rates, will need to be phased in over time and as additional traffic monitoring capabilities are developed. One implementation plan milestone for the CM process was to review the approved performance measures below, identify data needs and to develop long term and short term system monitoring plans. Work on this activity was completed in the 2007 Plan Supplement and is incorporated herein by reference.

Other Management Systems

Besides CM, MDOT continues to maintain five additional management systems. These include **bridge, intermodal, pavement, public transportation** and **safety**. TCRPC's memorandum of understanding on the transportation planning process (see Chapter 1) identifies continued use of these other management systems as evaluation tools to assess other system needs or deficiencies.

A short discussion of each of these management systems follows.

The **bridge management system (BMS)** is used for managing inspection, analysis and maintenance of numerous components that make up a bridge. MDOT uses FHWA's PONTIS software. PONTIS features an inventory of elements such as beams, joints and bearings, as well as the extent of deterioration. The bridge management system is a state-operated system with capability to separately consider needs of bridges in any MPO area or local jurisdiction.

The **intermodal management system** (IMS) is used for data management, analysis and deficiency identification for the state's non-highway transportation assets. It encompasses all public use, modal assets from the smallest carpool lot and intercity bus stop to the largest international air and marine ports.

The **pavement management system** (PMS) consists of PASER data collection on the surface condition of roadway assets, historical cost and remaining pavement service life. This data is used to perform a variety of engineering and planning functions. These include forecasting future network pavement conditions and costs associated with implementing various pavement strategies. With state legislation mandating an asset management process, TCRPC, MDOT and local agencies are actively working with the state Asset Management Council collect uniform condition information on all federal aid roads statewide in order to more consistently apply the PMS process. Expansion to all public roads is anticipated in future years.

The **public transportation management system** (PTMS) was developed to replace the annual paper grant application and reporting process used by transit agencies. It is used to establish vehicle, equipment and facility inventories that can be accessed by interested parties. Performance indicators and asset replacement forecasts are top priorities for the PTMS.

Table 8-1: TCRPC Congestion Management Performance Measures

- Crash rate analysis
- Congested vehicle miles of travel (VMT)
- Congested vehicle hours of travel (VHT)
- Average speed
- Congested speeds
- Delays: duration, extent, severity
- Delay per incident
- Average travel time per trip
- Persons per hour on the facility or in a corridor
- Level of Service (LOS)
- Congested lane miles
- Percent of vehicle miles traveled by functional classification
- Vehicle miles traveled per lane-mile
- Delay per lane mile
- Delay per vehicle miles traveled
- Delay per trip
- Delay per vehicle
- Delay rate
- Travel rate
- Number and percent of signal cycle failures
- Total vehicle delay
- Average and maximum queues

In consideration of movement of people and goods, other performance measures may include:

- Proportion of persons congested or delayed
- Person hours of delay
- Vehicle occupancy
- Other performance measures as integrated in the regional Congestion Management process.
- Person throughput per hour
- Does the project support increases in housing or population density consistent with the Regional Growth project principles?

The **safety management system** (SMS) is used for analyzing crashes and roads where they occur. Data collection for the highway safety management system consists of vehicle, pedestrian and bicycle crash data. The system provides for identification, analysis and implementation of engineering improvements at high-crash locations. System users can also summarize data and perform route based, time of return and peer group analyses.

TCRPC continues to support and apply these other management systems (above) to evaluate needs for other types of projects as appropriate.

For example, need for bridge projects contained in this plan have generally been drawn from the Bridge Management System, transit projects from the Public Transit Management System, etc. Additionally, as noted in Chapter 10, efforts are underway to further integrate the Pavement and Safety Management Systems in the region's planning process. As these systems continue to develop and mature, the integrated, cooperatively developed project selection process contemplated in Michigan's planning process memorandum of understanding is being fully implemented in the region.

Status of Federal CM Requirements

Federal planning regulations in 23 CFR 450.320 and 23 CFR 450.322 (F) (4) emphasize the integration of the CM process with the Regional Transportation Plan, the Transportation Improvement Program (TIP) and the programming process. Elements of TCRPC's approved CM process have been integrated throughout this document –from Regional Growth project results (Chapter 2) to Goals and Objectives (Chapter 3), the current chapter and Chapters 10, 11 and 13. They have also been integrated with the 2008-2011 Transportation Improvement Program and STP Project Priority Assessment Guidelines, along with the original approved 2004 CM process document and the 2007 Plan Supplement. To assist reviewers in locating various CM components throughout the TCRPC planning process, which initially began with preparation of the Regional 2025 Transportation Plan adopted in 2003, and which was then codified in the 2004 CM process document, Table 8-2 provides an overview of locations of the now current CM process elements or requirements.

Table 8-2: Location and Update Status of CM Elements

Congestion Mitigation Element or Requirement	Original Location	Updated?	Updated Location
Defines congestion	2004 CM Document	No	2004 CM Document
Describes TCRPC's congestion management process	2004 CM Document	No	2004 CM Document
Evaluates causes of congestion	2004 CM Document	Partly	2004 CM Document and 2035 Plan (Chapter 10)
Identifies and evaluates congestion mitigation strategies	2004 CM Document	Partly	2004 CM Document; Regional 2035 Plan: Chapter 11
Describes a process for analysis of congested corridors	2004 CM Document	No	2004 CM Document
Identifies responsibilities and division of labor for how these analyses will be conducted	2004 CM Document	No	2004 CM Document
Identifies extent and severity of current and future congestion by roadway location	2004 CM Document	Yes	Regional 2035 Plan: Chapters 10 and 11
Identifies and evaluates (by time of day) specific alternatives considered to address those congested locations	2004 CM Document	Yes	Regional 2035 Plan: Chapter 11
Identifies strategies which should be considered for implementation	2004 CM Document	Yes	Regional 2035 Plan: Chapter 11
Outlines funding sources available to address congestion	2004 CM Document	No	2004 CM Document
Documents an implementation plan for the CM process	2004 CM Document	No	2004 CM Document
Summarizes relationships between the adopted transportation plan, the adopted transportation improvement program and the approved CM process	2004 CM Document	No	2004 CM Document

Table 8-2: Location and Update Status of CM Elements

Congestion Mitigation Element or Requirement	Original Location	Updated?	Updated Location
A congestion management process	2004 CM Document 2007 Plan Supplement	Partly	2004 CM Document 2007 Plan Supplement Regional 2035 Plan: Chapters 10, 11
The process should result in multi-modal performance measures and strategies which are reflected in the plan and TIP	2004 CM Document	Partly	Chapter 8 – no change; Chapter 11 - Updated
Consideration of demand reduction and management operations improvements	2004 CM Document	Yes	Regional 2035 Plan: Chapter 11
The process is implemented within the metropolitan planning process and includes coordination with management and operations activities	2004 CM Document	Yes	Regional 2035 Plan: Chapters 10, 11, 13
It shall include methods to monitor and evaluate multi-modal performance, identifying causes of recurring and non-recurring congestion, identifies and evaluates alternatives, provides information supporting the implementation of actions and evaluates the effectiveness of implemented actions	2004 CM Document 2007 Plan Supplement	Partly	Alternatives Analysis Updated and Measures of Effectiveness Updated in Chapter 11
Defines congestion management objectives and performance measures to assess congestion and mobility enhancement strategies established by the MPO in consultation with operators of major modes	2004 CM Document 2007 Plan Supplement	Yes/Partly	Regional 2035 Plan: Chapters 3, 10, 11, 13

Table 8-2: Location and Update Status of CM Elements

Congestion Mitigation Element or Requirement	Original Location	Updated?	Updated Location
Establishes a coordinated program for data collection and monitoring	2007 Plan Supplement	No	2007 Plan Supplement
Identifies and evaluates strategies, including a specified list of measures ranging from growth management to ITS and public transit to traffic operational improvements and congestion pricing, and where necessary, additional capacity	2004 CM Document	Partly	2004 CM Document Regional 2035 Plan: Chapters 10, 11, 13
Identifies an implementation schedule, responsibilities and funding sources for strategies	2004 CM Document	Partly	2004 CM Document Regional 2035 Plan: Chapters 11, 13
Implement a process of periodic assessment of effectiveness of implemented strategies in terms of the area's established performance measures which is provided to decision makers and the public	2004 CM Document	Partly	2004 CM Document Regional 2035 Plan: Chapters 2, 10 and 11
Analyzes reasonable strategies for corridors where capacity projects are proposed (as discussed earlier) for non-attainment areas	2004 CM Document	Partly	Regional 2035 Plan: Chapters 10, 11, 13
Integrated in TIP/Programming Process	2004 CM Document 2008 – 2011 TIP; 2008 STP Priority Assessment Guidelines	No	2004 CM Document 2008-2011 TIP 2008 and 2009 STP Priority Assessment Guidelines