Lake-Sumter MPO
Metropolitan Planning Organization

CONGESTION MANAGEMENT PROCESS

Lake~Sumter Metropolitan Planning Organization

2012-2013

www.LakeSumterMPO.com

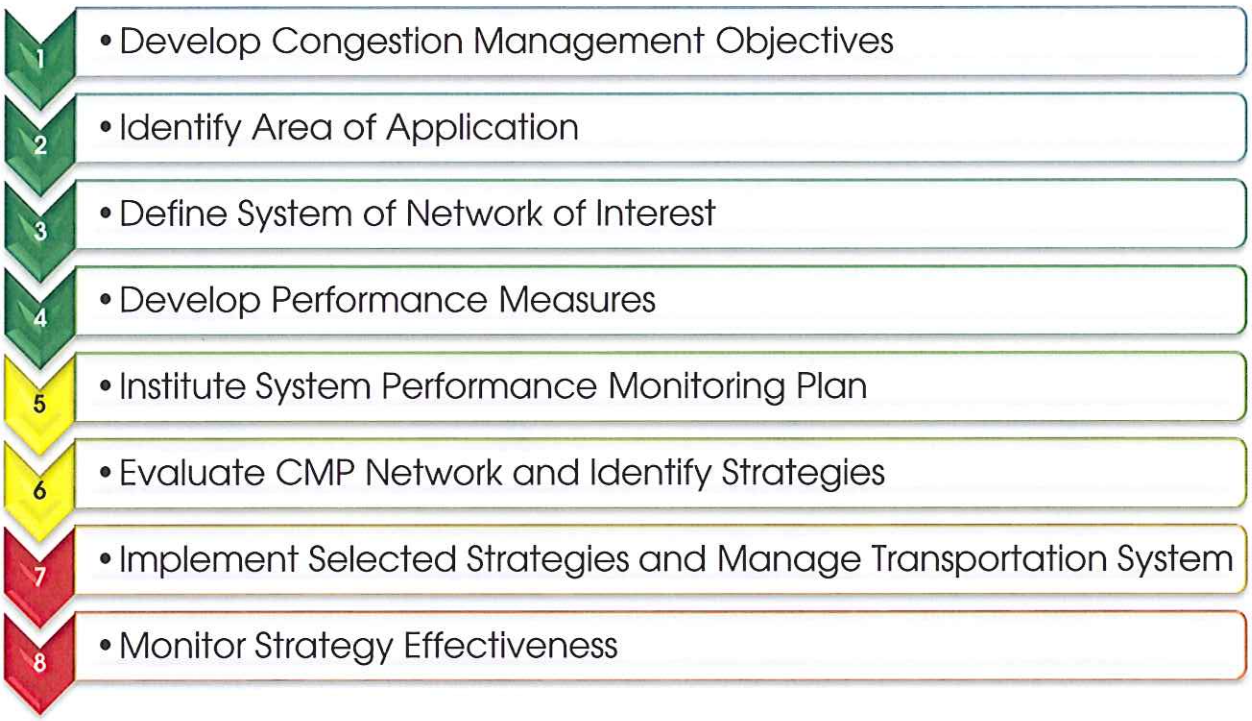
Introduction

The purpose of this document is to establish the Lake-Sumter Congestion Management Process (CMP) and outline the Year 1 progress. The CMP, which has evolved from what was previously known as the Congestion Management System (CMS), presents a systematic process for managing traffic congestion and provides information on transportation system performance. Federal legislation, specifically MAP 21, requires the transportation planning process to address congestion management through a system that provides for effective management and operation. In addition, Chapter 339.177 of the Florida Statutes requires the FDOT, in cooperation with the 26 MPOs to develop and implement a traffic congestion management process for managing programs and systems.

The CMP implementation in Lake-Sumter was achieved in coordination with the FDOT and a Development Team comprised of local government and agency staff members. To date, the analysis of the Lake-Sumter roadway network is based solely on the roadways volume to capacity ratio (v/c). The CMP must enhance the analysis of roadways by evaluating other mobility based measures to assess the roadway's congestion level. In addition, the CMP should provide an integral resource for the MPO's planning process by providing a tool box of improvement strategies which focus on congestion management without adding travel lanes and a scoring / ranking system to prioritize projects in the List of Prioritized Projects (LOPP) and Long Range Transportation Plan (LRTP).

Consistent with the 8 steps in the CMP process, this document is separated in the sections outlined in **Figure 1**. In coordination with the Development Team, the Year 1 Progress for the Lake-Sumter CMP advanced through step 6 of the process; therefore steps 7 and 8 will be addressed in the upcoming years.

Figure 1: CMP Process



Step 1: Develop Congestion Management Objectives

The objectives for the Lake-Sumter CMP were developed in accordance with the goals and objectives established in the Lake-Sumter Long Range Transportation Plan 2035. Through review of the Lake-Sumter Transportation 2035 Goals, it was determined that the objectives must address the following elements:

Mobility

To provide a multimodal transportation system that improves local and regional mobility and intermodal connectivity for our region's residents and visitors.

Safety and Security

To provide a multimodal transportation system that improves safety and security for all users.

Economic Development

To provide a multimodal transportation system that enhances regional economic development objectives, supports a competitive economy and utilizes and innovative transportation funding sources.

The use of the Lake-Sumter Transportation 2035 Goals provided an integral resource as developing a CMP, and the corresponding objectives, can provide challenges based on regional issues, stakeholder needs and fiscal affordability. It is the intent that the corresponding CMP objectives start out general (e.g., improve system reliability), but evolve overtime into more specific actions that include defining performance measures, collecting data, etc. – the objectives may be revisited and defined to be more specific, measurable, and bound to time (e.g., reduce the person hours of total delay on highways and major arterials associated with traffic incidents by —X percent over —Y years).

Ideal objectives should have "SMART" characteristics as defined below:

***S**pecific - Objective provides specificity to guide formulation of viable approaches to achieve the objective without dictating the approach.*

***M**easurable - Objective facilitates quantitative evaluation. Tracking progress against objectives enables an assessment of effectiveness of actions.*

***A**greed - Planners, operators, and relevant planning partners come to consensus.*

***R**ealistic - Objective can reasonably be accomplished within limitations of resources. Factors such as population growth, economic development, and land use may have an impact on the feasibility of the objective. Based on system performance data and analysis, the objective may need to be adjusted to be achievable.*

***T**ime-bound - Objective identifies a timeframe within which it will be achieved (e.g., "by 2015").*

Through coordination with the Development Team, the Goals and Objectives are outlined in **Figure 2**. The Figure also includes the associated performance measure of each objective. These performance measures are outlined in greater detail in Step 4.

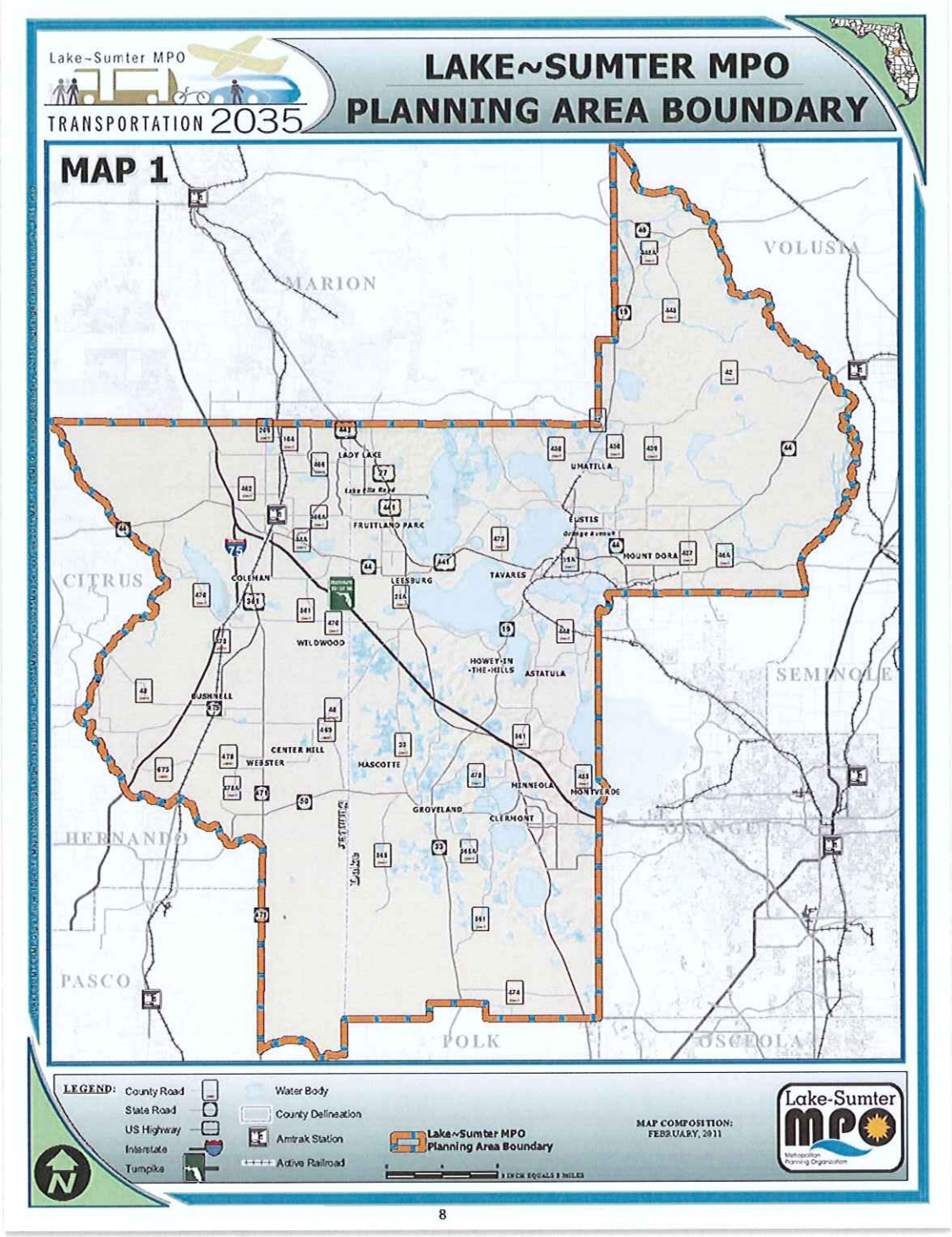
Figure 2: CMP Goals and Objectives

LAKE-SUMTER CONGESTION MANAGEMENT PROCESS: GOALS AND OBJECTIVES		
GOAL	**OBJECTIVE**	**PERFORMANCE MEASURE**
To provide a multimodal transportation system that improves local and regional mobility and intermodal connectivity for our region's residents and visitors	Expand roadway capacity across the region strategically to support new centers of growth, increase network connectivity and address regional accessibility and congestion.	Volume to Capacity
	Reduce the volume to capacity ratio on the congestion monitored network by 5% percent by year 2020.	Volume to Capacity
	Improve traffic movement through the region by encouraging the use of transportation options other than the single occupant vehicle.	Person-Throughput Utilization
	Improve the availability and level of service of public transit.	Person-Throughput Utilization
	Develop a multimodal network that facilitates the efficient movement of freight and goods throughout the region.	Travel Time Reliability
	Improve average on-time performance for specified transit routes/facilities by 10% percent within 10 years.	Travel Time Reliability
	Reduce hours of delay on the congestion monitored network by 5% percent by year 2020.	Average Delay
	Reduce mean incident clearance time per incident by 10% percent over 10 years.	Average Delay
To provide a multimodal transportation system that improves safety and security for all users.	Reduce crashes and fatalities for all modes of transportation by 10% percent within 10 years.	Average Crash Rate
To provide a multimodal transportation system that enhances regional economic development objectives, supports a competitive economy and utilizes innovative transportation funding sources.	Reduce the Cost of Congestion for all users of the system by 10% percent within 10 years.	Cost of Congestion

Step 2: Identify Area of Application

The area of application for the Lake-Sumter CMP has been established consistent with the MPO's Planning Area Boundary as depicted in **Figure 3**. This Planning Area Boundary incorporates all portions of both Lake and Sumter County including the 19 municipalities located within the two counties.

Figure 3: Lake-Sumter MPO Planning Boundary



Source: Lake-Sumter MPO Transportation 2035 LRTP

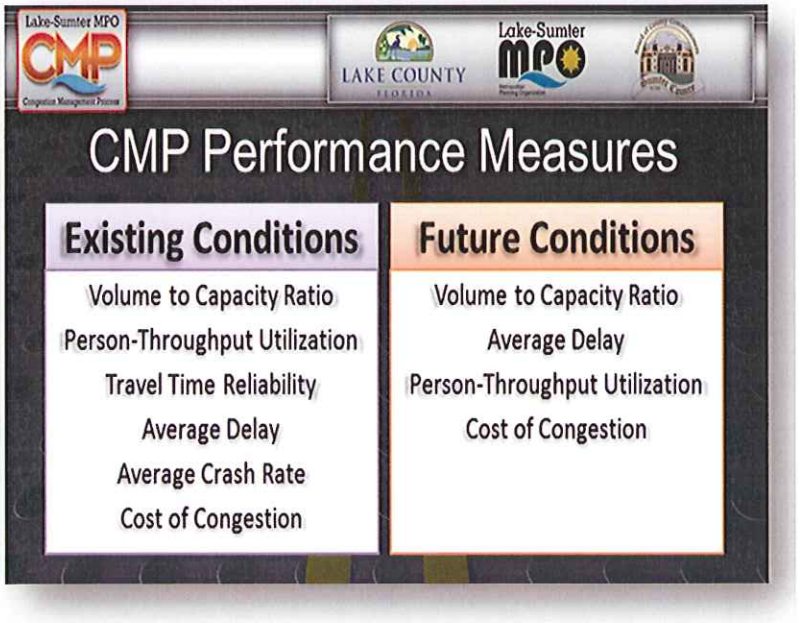
Step 3: Define System of Network of Interest

Similar to the Area of Application, the Lake-Sumter CMP has been established to focus on all major roadways within the Planning Area Boundary. For the purpose of the CMP, major roads were defined as those roads included within the MPO's Transportation Management System (TMS). While the evaluation will be provided for all roadways within the TMS, facilities should be continually ranked to prioritize those roadways with congestion issues.

Step 4: Develop Performance Measures

Figure 4 lists the performance measures that will be utilized to evaluate and prioritize the directions of the Lake-Sumter CMP. The performance measures are techniques for consideration based on the regions, challenges and policy direction from the municipalities. The selected performance measures are also consistent with those established on a State-wide level for the purposes of assessing roadway's on a platform consistent with other areas in the State. A description of each measure is also provided below:

Figure 4: Performance Measures



Volume to Capacity: Ratio of a roadways volume (peak hour peak direction) to the roadways maximum service volume.

Person-Throughput Utilization: Number of people (passenger vehicles and transit) traveling on a roadway on a daily basis compared to the maximum person-throughput of the roadway.

Travel Time Reliability: Ratio of actual travel time versus uncongested travel time

Average Delay: Average vehicle delay that occurs at a typical time-of day and day-of-week.

Average Crash Rate: Average crash rate per million vehicles on a roadway facility. The average crash rate is analyzed for the top 50 crash locations within the MPO and compared to the state-wide average crash rate of the specific facility type

Cost of Congestion: Cost of delay experienced by each person traveling on congested facilities

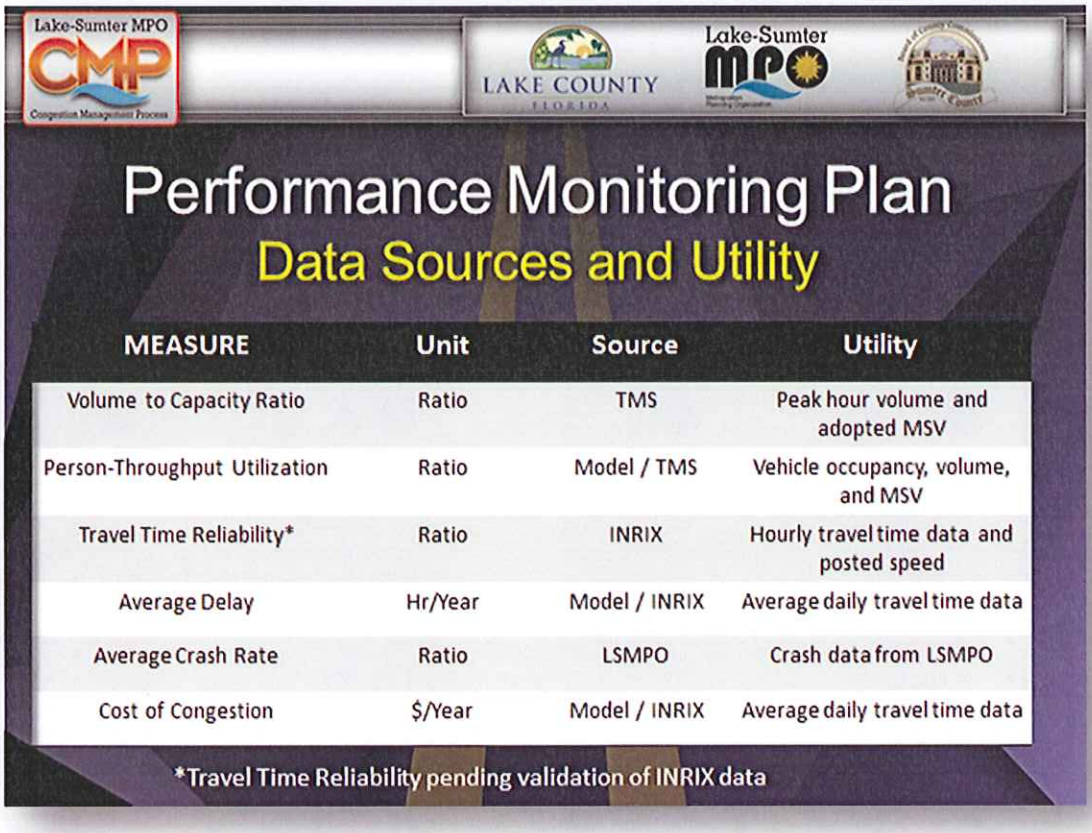
The associated goals and objectives for each performance measure was previously depicted in **Figure 2.** Detailed formulas and assumptions for each performance measure can be found in **Appendix A**.

Step 5: Institute System Performance Monitoring Plan

Gathering data to monitor system performance is typically the element of the CMP that will require the largest amount of resources. After establishing performance measures that will be used to evaluate system performance and a plan for collecting data, the MPO must to gather the data necessary continually update the CMP.

There are various types of data that can be used as part of the CMP process. Data types are often differentiated or categorized according to the source or underlying nature of the data. The following table includes the suggested data sources and utility to support the performance measures established for the CMP.

Figure 5: Performance Monitoring Plan



As noted on the table, it is recommended that the MPO utilize INRIX data to evaluate Travel Time Reliability, Average Delay, and Cost of Congestion. While Average Delay and Cost of Congestion may also be assed utilizing the travel demand model, the Travel Time Reliability is based solely on the INRIX data due to the necessity of hourly travel time data. The FDOT has provided the MPO with a snapshot of historical INRIX data for the roadways located in Lake and Sumter County. The INRIX data provides hourly travel times for approximately 26 percent of the segments included in the Lake-Sumter TMS. The MPO should utilize this data and supplement it with a travel time data collection program to obtain an adequate data set for analysis purposes. Roadway segments located in the most congested areas of the MPO should be prioritized for travel time data collection. The INRIX data can be found on the attached data CD.

Step 6: Evaluate CMP Network and Identify Strategies

Once the data collection process is conducted, the raw data must be translated into meaningful measures of performance. The Year 1 progress of the CMP implementation included an evaluation of the CMP Network; however, the Development Team recommended that the identification of strategies should be taken on in Year 2, providing time to optimize the methods of evaluation. The process of evaluating the CMP network is provided in this section along with a toolbox of possible improvement strategies for the MPO to consider in the upcoming year.

To evaluate the CMP Network, several factors were determined by the CMP Development Team. As mentioned previously, the CMP must be sensitive to the priorities of each County, therefore, the evaluation was done separately on a County by County basis. Other important factors were the analysis years for the evaluation and the travel demand model preferences. The following should be noted for these two factors:

Analysis Years:

Existing Year – YR 2012: This analysis year was selected to be consistent with the most recent data produced in the Lake-Sumter TMS

Future Year – YR 2035: This analysis year was selected to be consistent with the most recent Lake-Sumter MPO LRTP

Model Preferences:

The analyses were based on the latest Central Florida Regional Planning Model (CFRPM). The YR 2035 analysis will utilize the Existing plus Committed (E+C) roadway network as opposed to the Cost Feasible roadway network. The utilization of the E+C roadway network with 2035 traffic volumes is the preferred method of future analyses as it will best fit the current planning process in the MPO. The E+C network evaluation will provide a greater level of consistency from the CMP evaluation of congested facilities and the current methods used in strategizing the prioritization of improvements for the MPO's LOPP and LRTP.

To establish the Year 1 CMP network evaluation, a 5-step process was taken. **Figure 6** outlines the step by step process which will serve as the basis for future updates of the CMP.

The CMP Evaluation should be updated annually. While the framework for the analysis has been established, the data must be updated as it becomes available. As shown in step 5 of the evaluation, each facility analyzed in the network should be ranked based on its level of congestion as determined by the selected performance measures. The Year 1 progress of the CMP established a streamline evaluation tool which allows the MPO to efficiently rank the congested facilities based on the optimization of the sensitivity levels of each performance measure and analysis year. It is envisioned that this tool will be utilized to account for the specific priorities of Lake and Sumter County individually. The network analysis and evaluation tool can be found on the attached data CD. Complete evaluation factors and instructions for using the tool can be found in **Appendix A.** The first year evaluation of the CMP network, including top congested facilities by County and facility type can be found in **Appendix B**.

As previously mentioned, the CMP should establish and utilize a toolbox of improvements which includes strategies designed to address congestion management without the addition of travel lanes. While it is understood that roadway widening is sometimes the appropriate improvement, the toolbox of improvements provided in **Figure 7** also includes strategies that may improve an intersections operation or improve the transit and multi-modal characteristics of a corridor. The MPO should utilized this toolbox of improvements and optimize it to the specific needs of each county in the upcoming year of the CMP.

Figure 6: Evaluation Process

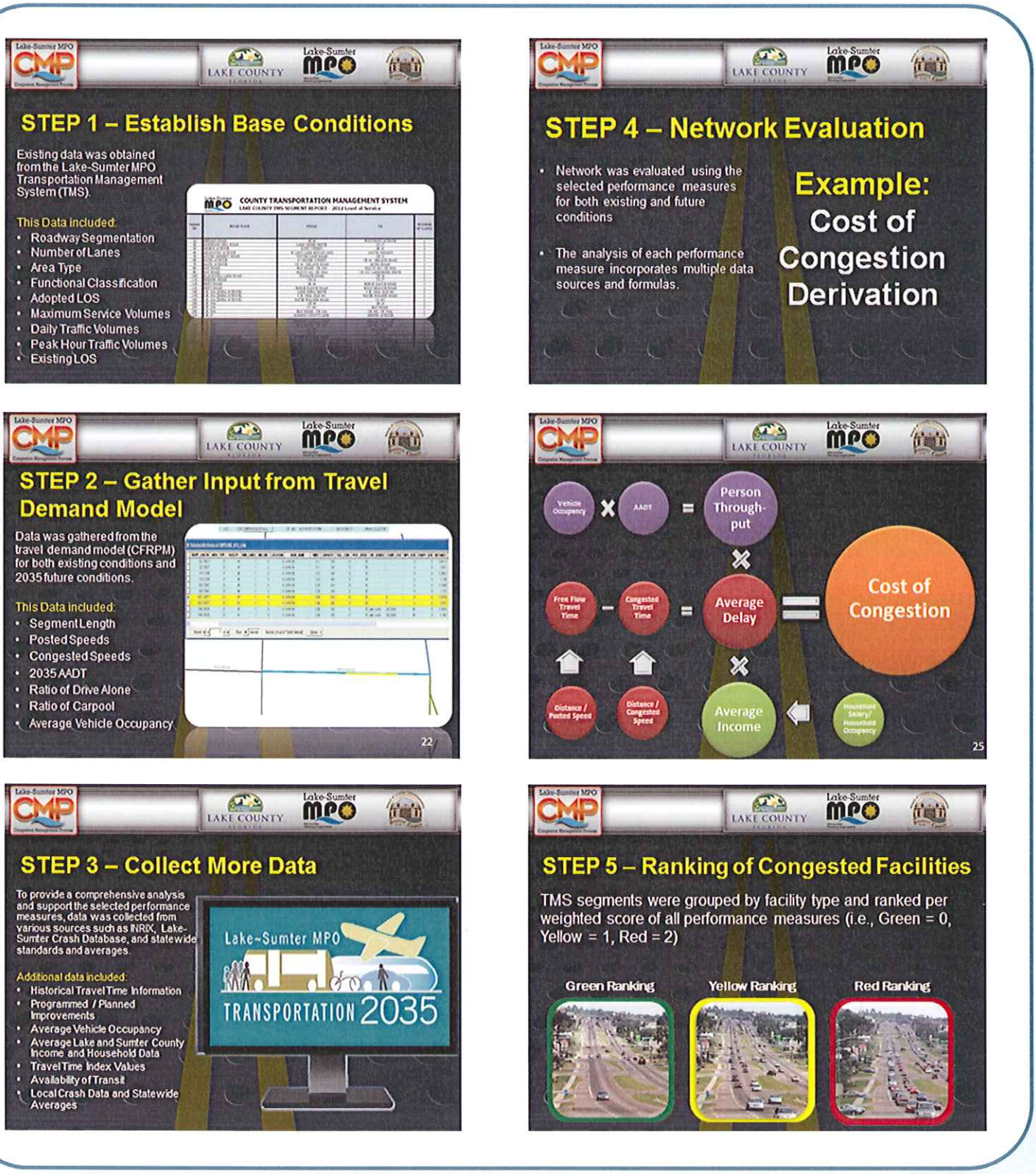


Figure 7: Toolbox of Improvements

Segment Type	Potential Transportation Improvement Options
Freeway Segment	Roadway Widening
	New Roadway or Reliever Route to Divert Through Traffic
	Intelligent Transportation Systems (ITS)
	Interchange Operational Improvements (Design, Signal Timing, Turn Lanes, etc.)
	Travel Demand Management (HOV, Managed Lanes, Telecommuting, Flex Hours, etc.)
	Access Management (New Interchange(s))
	Collector/Distributor Roadways
	Commuter Transit – Rail/BRT, Express Bus
Arterial Segment	Roadway Widening
	New Roadway or Reliever Route to Divert Through Traffic
	Intelligent Transportation Systems (ITS)
	Intersection Operational Improvements (Design, Signal Timing, Turn Lanes, etc.)
	Travel Demand Management (HOV, Telecommuting, Flex Hours, etc.)
	Access Management
	Frontage Roadways
	Transit Improvements
Collector Segment	Roadway Widening
	New Roadway or Reliever Route to Divert Through Traffic
	Intelligent Transportation Systems (ITS)
	Intersection Operational Improvements (Design, Signal Timing, Turn Lanes, etc.)
	Travel Demand Management (HOV, Telecommuting, Flex Hours, etc.)
	Access Management
	Pedestrian/Bicycle Facilities
	Local Bus Service

Step 7: Implement Selected Strategies and Monitor Transportation System (Next Steps)

The implementation of the CMP strategies should be done on three levels: Regional, Corridor, and Project.

Regional Prioritization of Strategies

Use the CMP in criteria for prioritizing projects in the LOPP and LRTP – Similar to the ranking process in the network evaluation, the process of prioritizing projects for inclusion in the LOPP and LRTP could include a scoring element that gives weight to the relative congestion on a corridor based on the CMP data and performance measures. In a formal scoring process, points could be allotted based on a number of factors, including the potential for the project to address and manage congestion. Scoring systems could treat projects differently based on location or strategy type according to congestion levels, or community goals. For instance, more points might be allotted to projects in very congested locations, or, specifically to certain types of projects in the urban core than to projects in areas where further development is not desired.

Explicitly set aside funding for congestion management projects

Lake-Sumter MPO can establish a program designed to fund relatively small congestion management projects. The CMP can be used to define criteria for rapid allocation of funds to solve straightforward congestion problems. This can be useful not only for improving mobility, but also for elevating the MPO's visibility among stakeholders that are primarily interested in short-term implementation, such as freight shippers and developers. It may be useful to identify geographic areas of need based on congestion data, in which projects would then be eligible for funding under such a program. This approach may be useful in larger areas with numerous large projects competing for transportation funding, where smaller projects may have difficulty competing on their

own, and in areas where quick-response projects may arise in between regular TIP cycles. Other MPOs have implemented this technique, for example; METROPLAN Orlando has set aside funding for quick-response operational improvements. Miami-Dade MPO in Miami, Florida, is expanding an earlier set-aside program to take a more comprehensive, corridor-wide approach to funding congestion management improvements, better integrating them with one another and the MTP. Such projects will have a set-aside fund as of the 2015 TIP, and in the meantime the agency will conduct CMP improvement studies on congested corridors in preparation for design work and seek alternative funding for more immediate implementation.

Corridor and Project Studies

In many cases, specific congestion management strategies may be identified through more detailed corridor studies and project development efforts. Because projects are most often implemented by agencies other than the MPO, this requires oversight by the MPO staff or a system to relay information on the effectiveness of associated strategies. Such information is crucial to achieving the full realization of the CMP as a continuous process. This step also represents the point at which consistency between planned/programmed projects and the CMP should be ensured, particularly for projects that will add capacity to roadways. Collaboration with partners at implementing agencies is a critical element of this step. As projects are advanced to project development and environmental review, the CMP offers an opportunity to link planning and the National Environmental Policy Act process. This process can sometimes break down if project developers and designers are not aware of the CMP's congestion management objectives or the range of performance measures that are being used regionally to monitor performance.

Step 8: Monitor Strategy Effectiveness (Next Steps)

Evaluation of strategy effectiveness can be seen as either a sequential step within the CMP process or as an on-going process. This is an essential, required element of the CMP that is often overlooked. The primary goal of this step is to ensure that implemented strategies are effective at addressing congestion as intended, and to make changes based on the findings as necessary. Two general approaches are used for this type of analysis:

System-level performance evaluation: Regional analysis of historical trends to identify improvement or degradation in system performance, in relation to objectives; and

Strategy effectiveness evaluation: Project-level or program-level analysis of conditions before and after the implementation of a congestion mitigation effort.

To ensure that the CMP is progressing and achieving the established goals and objectives, each year's CMP annual report should include an analysis of the previous year's development and effectiveness.