METROPOLITAN PLANNING ORGANIZATION
HERNANDO / CITRUS

Congestion Management Process

POLICY AND PROCEDURES HANDBOOK

MAY 2017

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Introduction

Maintenance of a CMP is a requirement for all MPOs under Florida law and for MPOs in Transportation Management Areas (TMAs) under federal law. Consistent with the guidance from the Final Rule on the CMP, the intent of the CMP Update is to "address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system." A vibrant congestion management process can serve a valuable role in addressing the region's transportation needs in light of the following:

- Funding levels limit the number of new large scale projects which can be planned and constructed
- Transportation safety is becoming an increasingly important planning consideration

Although the Hernando/Citrus MPO is not in a TMA, which is defined as an urbanized area with a population over 200,000, both counties have developed and implemented congestion management efforts "to provide the information needed to make informed decisions regarding the proper allocation of transportation resources" as required by Florida law.

In 2011, the formally known Hernando County MPO developed a significantly updated Congestion Management Process. After release of data from the 2010 Census, Citrus County qualified as an urbanized area and thus there was coordination of the merger with the Hernando County MPO (HCMPO) by the Citrus County TPO. The first step was to expand the HCMPO to include the Homosassa Springs-Beverly Hills-Citrus Springs Urbanized Area by expanding the Metropolitan Planning Area Boundary (MPAB). Hernando/Citrus MPO developed a reapportionment plan that involved the Citrus County membership, the MPAB expansion, and the resolutions of support from the affected city and county jurisdictions. Hernando and Citrus County planning organizations approved the merger in December of 2013, thereby creating the Hernando/Citrus MPO.

Typically, the Congestion Management Process Policy and Procedures Handbook needs to be updated every five years concurrent with or following the development of the MPO's Long Range Transportation Plan which is also updated on a five year cycle. This Hernando/Citrus MPO Congestion Management Process Policy and Procedures Handbook addresses the following changes since the Hernando MPO's 2012 report:

1. Includes Citrus County for a consolidated Hernando/Citrus MPO planning area.
2. Addresses changes in Federal Transportation Legislation resulting from the passage of MAP-21 (June 2012) and the FAST Act (December 2015) and the subsequent rulemaking available at the time when this Policy and Procedures Handbook was developed in late 2016. In some cases, anticipated rulemaking regarding transportation performance measures has been incorporated to potentially reduce the need for interim updates outside of the five-year cycle.
3. Integrate Complete Streets into the Congestion Management Process and in support of other planning efforts by the MPO. This is consistent with the ongoing implementation of complete streets being undertaken by the Florida Department of Transportation.

Congestion Management Process

The Congestion Management Process (CMP) is a management system and process conducted by metropolitan planning organizations (MPO), such as the Hernando/Citrus MPO, to improve traffic operations and safety through the use of either strategies that reduce travel demand or the implementation of operational improvements. The Hernando/Citrus MPO is required by the federal government to implement a CMP as part of its routine planning efforts. The public will benefit from having a functional CMP in place because it can improve travel conditions through the use of low cost improvements or strategies. The improvements can be implemented in a relatively short timeframe (within 5-10 years) compared to more traditional capacity improvements, such as adding additional travel lanes, which can take more than 10 years to implement and cost significantly more. Projects identified through the CMP process may also be added to future updates of the Long Range Transportation Plan should they require additional funding or a longer timeframe for implementation.

The Federal Highway Administration (FHWA) defines a CMP as "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 has evolved from what was previously known as the Congestion Management System (CMS). Key highlights of the Hernando/Citrus CMP include:

- Routine completion of a technical process undertaken (typically each year) to identify projects that are needed to reduce congestion and that are prioritized for funding in the County's Capital Improvement element.
- Routine meetings by the MPO's Technical Advisory Committee (TAC)/Transportation Systems Operations Committee (TSOC).

Causes of Congestion

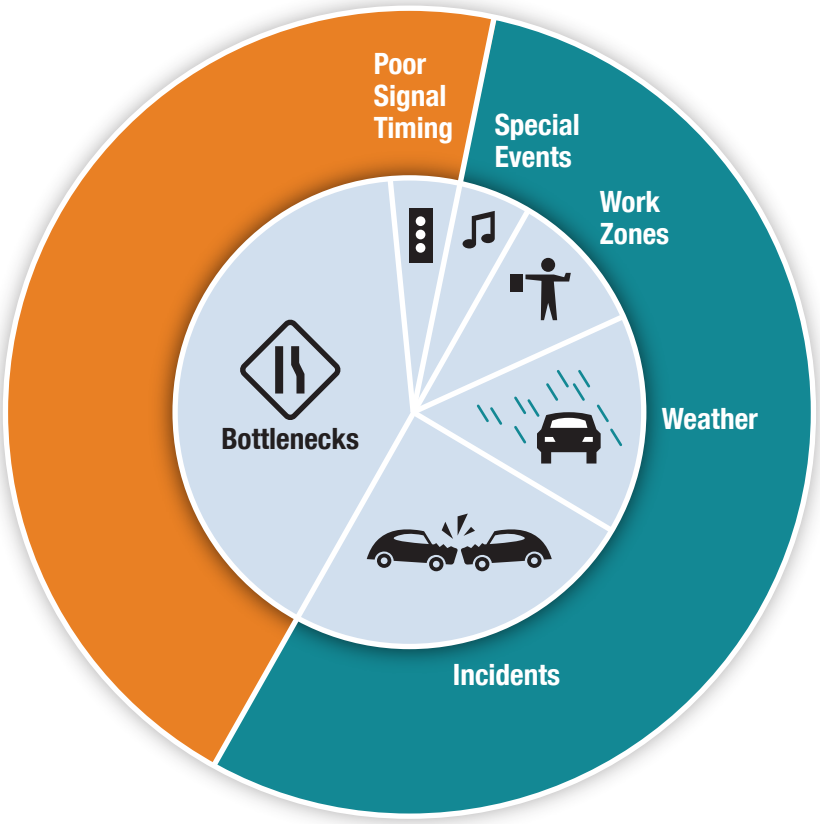
The process of congestion management begins by understanding the cause of the problem. **Figure 1** illustrates the results of a national study presented by FHWA on the sources of congestion. Six major causes of congestion are identified:

- **Bottlenecks** – points where the roadway narrows or regular traffic demands (typically at traffic signals) cause traffic to back up; these are the largest source of congestion and typically cause a roadway to operate below its adopted level of service standards.
- **Traffic Incidents** – crashes, stalled vehicles, debris on the road; these incidents cause about one quarter of congestion problems. A focus of the Hernando/Citrus MPO's CMP will be reducing crashes that can cause congestion and expediting incident response to clear incidents where Intelligent Transportation Systems (ITS) surveillance is in place.
- **Work Zones** – for new road building and maintenance activities, such as filling potholes; caused by necessary activities, but the amount of congestion caused by these actions can be reduced through a variety of strategies.
- **Bad Weather** – cannot be controlled, but travelers can be notified of the potential for increased congestion and signal systems can adapt to improve safety.

- **Poor Traffic Signal Timing** – the faulty operation of traffic signals or green/red lights where the time allocation for a road does not match the volume on that road; poor signal timings are a source of congestion on major and minor streets.
- **Special Events** – cause "spikes" in traffic volumes and changes in traffic patterns; these irregularities either cause or increase delay on days, times, or locations where there usually is none.

As shown in **Figure 1-1**, bottlenecks are the largest cause of congestion nationally, followed by traffic incidents and bad weather. Adverse weather cannot be controlled, but policies and improvements can be implemented to control traffic incidents and bottlenecks. Due to the lack of comprehensive local studies on the causes of congestion, these national data are widely used in CMP updates. The data suggest that local causes are likely to be similar, with bottlenecks and traffic incidents typically being the top two causes of congestion.

Figure 1-1: Causes of Congestion



Federal Requirements

Public Law 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21), was signed into law on July 6, 2012 and provided federal transportation funding for fiscal years 2013 and 2014. MAP-21 was the first transportation legislation enacted since 2005 and provides updated policy and programmatic framework for investments to guide the growth and development of the country's vital transportation infrastructure. It was the intent of MAP-21 to create a streamlined, performance-based, multi-modal program to address the needs of the national transportation system as outlined in the National Goals listed below. Fundamental aspects of this legislation extended to future fiscal years through continuing legislation and through a new transportation bill. On December 4, 2015, Public Law 114-94, the Fixing America's Surface Transportation Act (FAST Act) was signed into law. The FAST Act will likely fund transportation programs for fiscal years 2016 through 2020 and is the first long-term surface transportation authorization enacted in a decade that provides funding certainty for surface transportation. The FAST Act will support critical transportation projects to ease congestion and facilitate freight movement on major roads by establishing and funding new policies and programs.

National Goals

- **Safety** – to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure condition** – to maintain the highway infrastructure asset system in a state of good repair.
- **Congestion reduction** – to achieve a significant reduction in congestion on the National Highway System.
- **System reliability** – to improve the efficiency of the surface transportation system.
- **Freight movement and economic vitality** – to improve the National Highway Freight Network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental sustainability** – to enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced project delivery delays** – to reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

Federal Regulations

The following section summarizes the Federal requirements for a Congestion Management Process in Transportation Management Areas. This guidance is codified in the Code of Federal Regulations (CFR (Section 450.322) — Statewide Transportation Planning; Metropolitan Transportation Planning; Final Rule).

a. The transportation planning process in a TMA shall address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system.
   - Cooperatively developed and implemented
   - Travel reduction strategies
   - Operational management strategies

b. The CMP should result in multimodal system performance measures and strategies that can be reflected in the metropolitan transportation plan and the TIP.

c. Acceptable levels of service may vary from area to area. In addition, consideration should be given to the following strategies:
   - Manage demand
   - Reduce single occupant vehicle travel
   - Improve transportation system management and operations
   - Improve efficient service integration within and across the following modes:
     I. Highway
     II. Transit
     III. Passenger and freight rail operations
     IV. Non-motorized transport
   - Where general purpose lanes are determined to be appropriate, must give explicit consideration to features that facilitate future demand management strategies.

d. The CMP shall be developed, established, and implemented in coordination with Transportation Systems Management (TSM) and operations activities. The CMP shall include:
   - Methods to monitor and evaluate the performance of the multimodal transportation system
     I. Identify the underlying causes of congestion
     II. Identify and evaluate alternative strategies
     III. Provide information supporting the implementation of actions
     IV. Evaluate the effectiveness of implemented actions
   - Definitions of congestion management objectives and appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of strategies. Performance measures should be tailored to the specific needs of an area and established cooperatively by the State, MPOs, and operators of major modes of transportation, including providers of public transportation.
   - Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion. To the extent possible, this program should be coordinated with existing sources, including providers of public transportation.
   - Identification and evaluation of the anticipated performance and expected benefits of congestion management strategies that will contribute to the more effective use and improved safety of the existing and future transportation system. Examples of strategies to consider include:
     I. Demand management measures, including growth management and congestion pricing
     II. Traffic operational improvements
     III. Public Transit improvements
     IV. Information Technology Services (ITS) technologies
     V. Where necessary, additional system capacity

- Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy.
- Implementation of process for periodic assessment of the effectiveness of implemented strategies. Results of this assessment shall be provided to decision makers and the public to provide guidance on the selection of effective strategies for future implementation.

e. TMA designated nonattainment for ozone or carbon monoxide may not program Federal funds for any project that will result in a significant increase in the carrying capacity of Single Occupant Vehicles (SOVs), with the exception of safety improvements or the elimination of bottlenecks (within the limits of the appropriate projects that can be implemented).

f. In TMAs designated nonattainment for ozone or carbon monoxide, the CMP shall provide an appropriate analysis of reasonable (including multimodal) travel demand reduction and operational management strategies for a corridor in which a project with a significant increase in SOV capacity is proposed to move forward with Federal funds.

g. State laws, rules, and regulations pertaining to congestion management systems or programs may constitute the congestion management process, if FHWA and FTA find that these are consistent with the intent of this process.

h. Congestion management plan. A MPO serving a TMA may develop a plan that includes projects and strategies that will be considered in the TIP of such MPO. Such plan shall:

- Develop regional goals to reduce miles traveled during peak commuting hours and improve transportation connections between areas with high job concentration and areas with high concentrations of low-income households;
- Identify existing public transportation services, employer based commuter programs, and other existing transportation services that support access to jobs in the region; and
- Identify proposed projects and programs to reduce congestion and increase job access opportunities.

In developing the CMP, an MPO shall consult with employers, private and nonprofit providers of public transportation, transportation management organizations, and organizations that provide job access reverse commute projects or job-related services to low-income individuals.

Congestion Management Process: A Guidebook

Federal Eight-Step Congestion Management Process

In April 2011, the FHWA released the Congestion Management Process: A Guidebook document which provides additional detail and guidance to MPOs in the development and implementation of a congestion management process. This guidebook includes an eight-step process that summarizes the key parts of an ongoing congestion management process. These steps are summarized in **Figure 1-2**.

Figure 1-2: Federal Eight Step Congestion Management Process

Incorporating Travel-Time Reliability in the CMP: A Primer

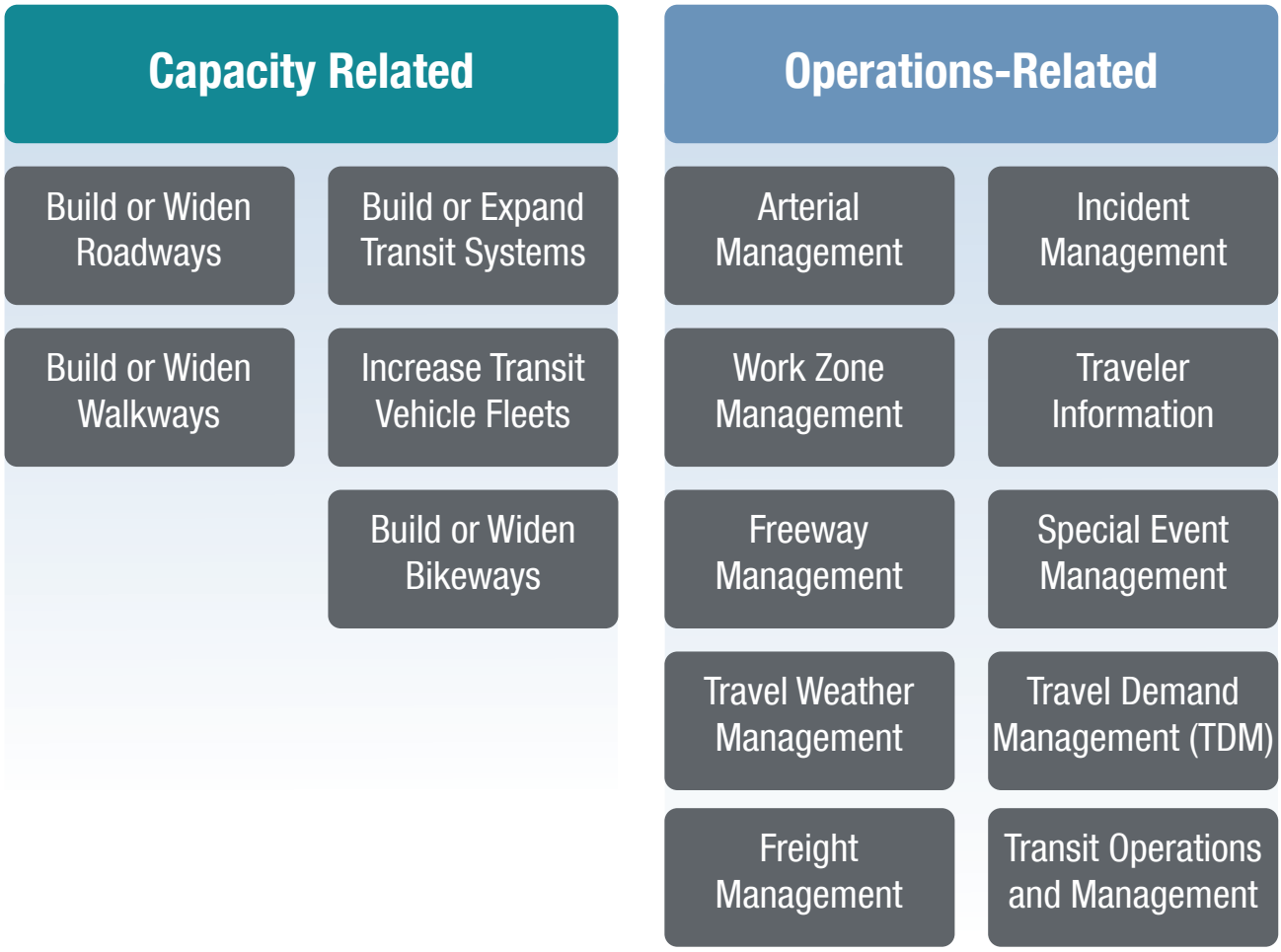
Travel-time reliability is defined as the consistency and dependability in travel times that are measured from day-to-day and/or across different times of the day. Travel-time reliability is significant to the CMP because it incorporates a systematic method to address the issue of traffic congestion caused by non-recurring events. Non-recurring events include:

Non-recurring events account for a majority of total traffic congestion-related delay in the United States and not until recently were there cost-effective data collection opportunities. In addition to more inexpensive travel-time monitoring technologies, there are three factors that have contributed to a greater focus on travel-time reliability in MPOs. These factors include:

- **Constraints on Expansion of the Transportation System** – New roadway construction and roadway expansion has largely ended in the United States due to high costs, the built-out nature of urbanized areas, and the community desire for multimodal streets.
- **Expectations of the Traveling Public** – Surveys have shown that the traveling public often values travel-time reliability more than speed.
- **Federal Surface transportation Reauthorization Law** – When MAP-21 was signed into law, a process that involved performance measurement, target setting, and transportation investment reporting was established and seven national goals were set. Three years later, the FAST Act was signed into law and included the same national goals. One of the seven goals is: System reliability – to improve the efficiency of the surface transportation system.

The benefits of incorporating travel-time reliability into the CMP include a superior understanding of the regional transportation system that contains capacity expansion strategies. The inclusion of travel-time reliability will take the CMP a step further by also featuring a heavier concentration of operation strategies, such as signal retiming or traveler information as appropriate by the area and type of transportation corridor.

Figure 1-3: Typical Capacity and Operations Related Strategies



CMP Policy and Procedures Handbook Overview

As mentioned previously, the Hernando/Citrus MPO is required by the Florida Statute to implement a CMP as part of its routine planning efforts. This handbook outlines the policies and procedures that will ensure that the federal and state requirements are addressed. Specific performance evaluation information on the Hernando and Citrus County networks will be included in future State-of-the System Reports.

This handbook is outlined to follow the eight-step CMP, based on federal guidelines. The main purpose of this handbook is to (1) Develop CMP Goals and Objectives, (2) Define the Regional CMP Network, (3) Develop Multimodal Performance Measures, (4) Identify the potential sources of data to monitor system performance, (5) identify policies and procedures for the update of the CMP. The report chapters found in this handbook are described in more detail below.

Chapter 1, Introduction – The purpose of the CMP (based on federal requirements), an introduction to the causes of congestion, and an overview of the handbook are provided.

Chapter 2, CMP Overview – The eight-step CMP is described and a general overview of the process is provided as well as the update schedule for the Annual State of the System Report.

Chapter 3, Goals and Objectives – The remainder of the chapters in this handbook discuss specific steps from the eight-step CMP. The Goals and Objectives of the CMP are documented in this chapter. This Chapter also includes policies associated with the implementation of Complete Streets.

Chapter 4, Network Identification – A description of the area of application and transportation network used for the CMP process is provided.

Chapter 5, Development of Performance Measures – A brief summary is provided of congestion related measures that can be used to monitor the effectiveness of the CMP.

Chapter 6, System Performance Monitoring Plan – This chapter describes how to evaluate and monitor the system, identify congested corridors and select corridors for evaluation, evaluate corridors and potential strategies (described in Chapter 7), and prioritize and program improvements.

Chapter 7, Congested Corridor Selection and CMP Strategies – This chapter describes how congested corridors are typically identified and strategies that can be used to reduce congestion and different strategies that can be used to improve identified congested corridors.

Chapter 8, Monitor Strategy Effectiveness – This chapter describes monitoring of strategies implemented; as well as, information that can be found in the Annual State of the System report.

METROPOLITAN PLANNING ORGANIZATION
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Congestion Management Process

POLICY AND PROCEDURES HANDBOOK

Chapter 2
CMP Overview

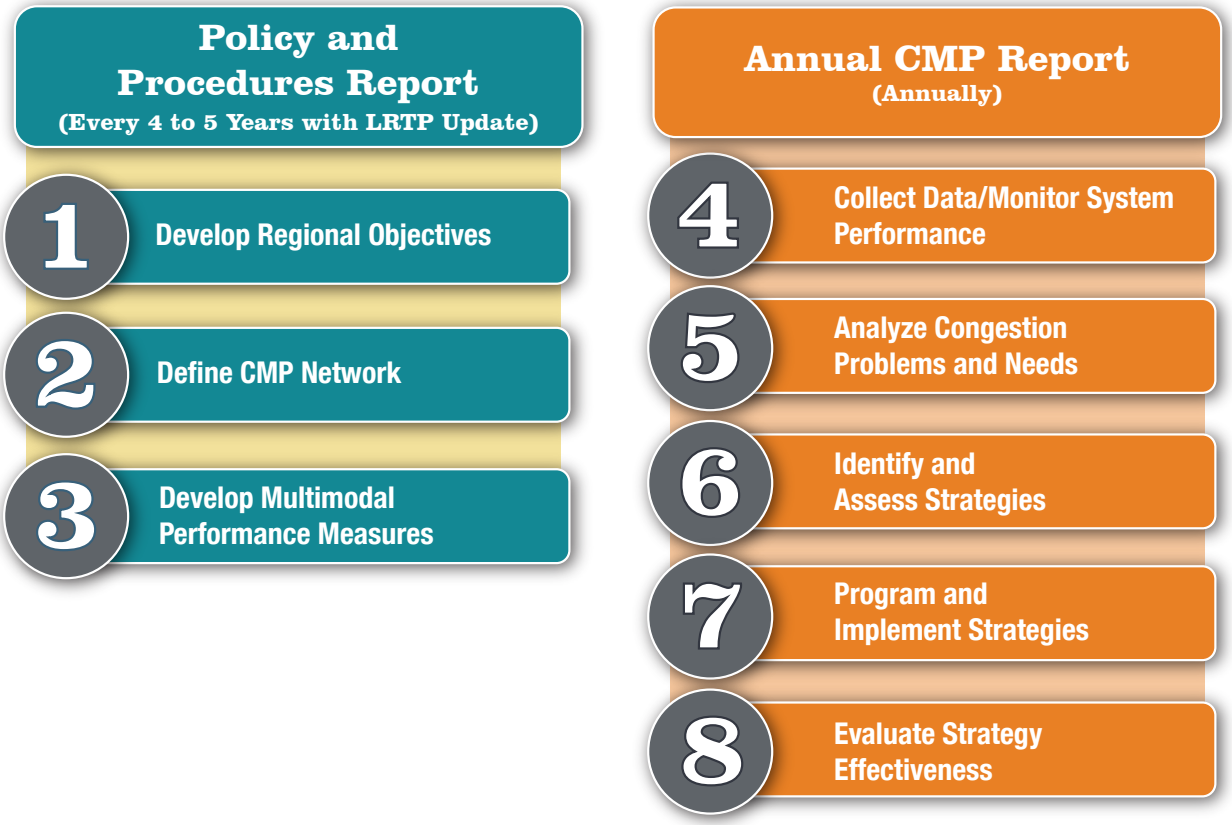
Chapter 2
CMP Overview

Hernando/Citrus MPO Eight-Step Congestion Management Process

This section documents the revised Congestion Management Process for the Hernando/Citrus MPO that will be used to address the Federal requirements and unique local needs and opportunities of the communities in Hernando/Citrus Counties. This process closely matches the Federal Eight-Step Process and includes additional detail in specific sections where appropriate.

Figure 2-1 demonstrates the Eight-Step process that will be used by the Hernando/Citrus MPO. As noted, the first three steps will typically be updated concurrent with each update of the Long Range Transportation Plan which takes place every four to five years. Steps 4 to 8 will potentially be updated on an annual basis. The remainder of this section details the Eight-Steps and how they will be implemented.

Figure 2-1: Hernando/Citrus MPO's Approach to the Federal Eight Step Process



Complete Streets

Complete Streets policies and guidelines are being established at the Federal, State, and local levels. The safety and mobility benefits of using a complete streets approach is consistent with the goals and objectives of the Congestion Management Process. Currently the Florida Department of Transportation (FDOT) is close to completing a two-year process to implement Complete Streets in all aspects of their ongoing efforts to accommodate transportation needs in the state. The FDOT Complete Streets policy adopted in September 2014 states that:

> *"…the Department will routinely plan, design, construct, reconstruct and operate a context sensitive system of 'Complete Streets.' While maintaining safety and mobility, Complete Streets shall serve the transportation needs of transportation system users of all ages and abilities, including but not limited to: cyclists, freight handlers, motorists, pedestrians, and transit riders."*

The establishment of a vision and policy to take a Complete Streets approach in Hernando and Citrus Counties by the MPO is consistent with the partnership the MPO has with the FDOT and local agencies to provide efficient and safe transportation options.

Figure 2-3 illustrates how taking a Complete Streets approach encompasses all aspects of the Congestion Management Process: Balancing safety, mobility, and capacity.

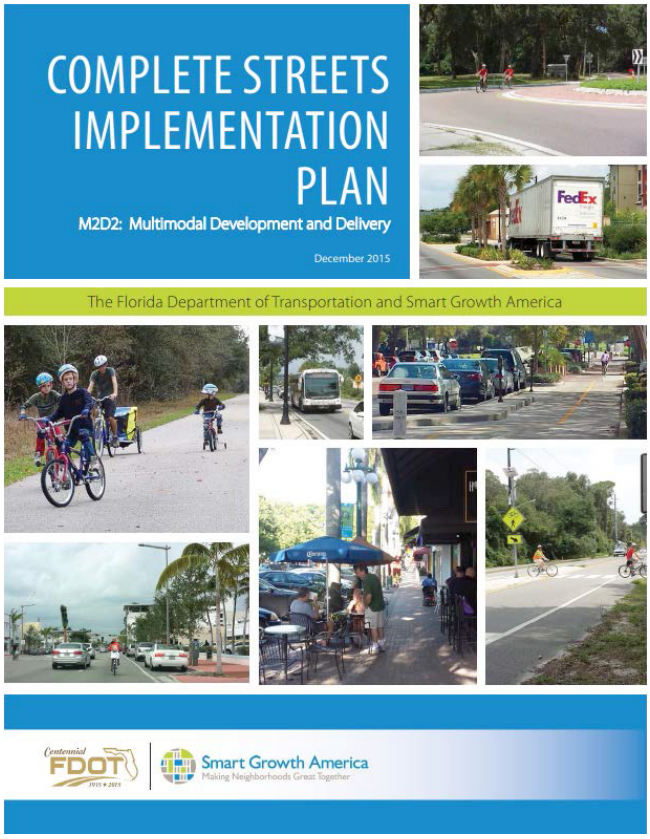
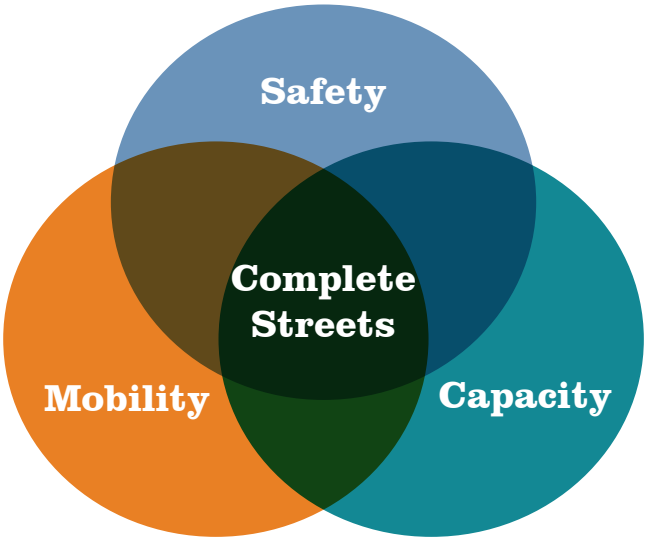


Figure 2-2: FDOT Complete Streets Implementation Plan

Figure 2-3: Complete Streets Approach



Complete Streets Vision

The Hernando/Citrus MPO envisions streets and highways that take a context sensitive approach to provide safe travel for all appropriate modes of travel and users, regardless of their age or abilities; to promote economic development through the creation of a livable community with a sense of place that also promotes public health and fitness.

Complete Streets Definition

Complete streets are streets for everyone. They are context sensitive streets or roadways that are designed and operated for safe access and travel by all appropriate users of all ages and abilities, including, but not limited to motorists, bicyclists, pedestrians, transit users, technology and other mobility providers, freight haulers. Complete streets allow the public to safely cross the street, walk or bicycle to shops and/or work. They support safe and convenient access to transit services.

Complete Streets Action Plan

In cooperation with the FDOT and member judications, the MPO will:

1. Establish a "Complete Street Network": to consist of planned and existing arterial and collector roads (excluding limited access facilities) where complete streets design is appropriate (typically within urban or other developed areas).
2. Define street segments based on logical termini and/or roadway context, urban and rural areas (based on Census data), existing and future transit corridors and transfer centers (based on the Long Range Transportation Plan).
3. Establish standards for roadway segments on the Complete Streets Network.
4. Modify its current roadway network database to create a "Complete Streets Database" with appropriate data related to complete streets, i.e., bicycle and pedestrian features and access to transit service.
5. Develop performance standards for complete streets in the 2045 Long Range Transportation Plan.
6. Develop a prioritization process for the identification of corridors to be considered for and receive complete street improvements.
7. Develop Complete Streets guidance to serve as a resource for local governments in the planning, design, construction, operation, and maintenance of complete streets.
8. Develop model project review guidelines for new development consistent with guidance from the Complete Streets Handbook.
9. Make use of the Complete Streets Matrix included with the Congestion Management Process for the review of corridors for complete streets improvements.
10. The MPO will perform a Complete Streets Review for maintenance projects programmed in the Florida Department of Transportation (FDOT) Five-year Work Program as part of its "Early and Continuing Process for the Review of Resurfacing Projects." Where applicable and feasible, additional complete street features will be added to maintenance projects using supplemental funding from the MPO's set-aside for Congestion Management Projects.
11. The MPO includes a set-aside of approximately $500,000 per county for Complete Streets Projects as part of its annual Priority Transportation Projects to include:
    a. Traffic operation and safety improvements such as traffic signal upgrades, the addition of turn lanes, lighting and crossing improvements;
    b. Transit route access improvements such as concrete landing pads; and
    c. Bicycle and pedestrian improvements such as the construction of new sidewalks, bicycle facilities, multi-use trails, or enhanced street crossings;
    d. Facilitation of goods movement.
12. In cooperation with FDOT, and its member jurisdictions, the Hernando/Citrus MPO will perform complete street corridor studies to identify candidate projects for funding on a corridor level.

Figure 2-4: Illustrative Complete Street Corridor

CMP in the Metropolitan Planning Process

The CMP is a working tool that needs to be effectively integrated into the MPO's project prioritization process, Transportation Improvement Plan (TIP), and Long Range Transportation Plan (LRTP). The objectives- driven, performance-based CMP starts with the monitoring and evaluation of current conditions to identify where congestion exists. Based on the identified goals and objectives and the established performance measures of the CMP, this evaluation leads to the identification of potential mitigation strategies, implementation of appropriate strategies, and the development of a monitoring plan.

The outputs of the CMP, such as identified congested corridors/ locations and their recommended mitigation measures, then proceed through the CMP process where they are evaluated and projects or programs are selected for implementation. The projects or programs that are identified for implementation through the CMP are then moved into project development and programmed into the TIP for funding and implementation. The implemented projects are then monitored to evaluate the

strategy effectiveness on a system-wide basis. In Hernando and Citrus County, CMP projects typically are funded using boxed funds identified in the LRTP along with other local revenues. This allows the MPO to add annually the most important strategies for implementation and expand funding levels to address local needs.

Public Involvement Process

The purpose of CMP public involvement activities is to provide the public with information on congestion monitoring activities that are in place in Hernando and Citrus County as well as planned improvements to mitigate congestion. Previously, significant progress has been made in Hernando County toward identifying congested corridors and alternative transportation improvement strategies to alleviate congestion and enhance the mobility of persons and goods at key locations through prior CMP updates. This approach will now expand to Citrus County.

As recent federal regulations warrant involvement of the public during all key stages of transportation projects, it is important to involve the public in all key stages of transportation improvement projects within and beyond the CMP. Otherwise, lack of public support and awareness may adversely impact the success of any potential transportation project. Therefore, the proposed CMP improvement projects/strategies will be presented to the citizens of Hernando and Citrus County at various public involvement activities.

The MPO's TAC/TSOC serves as the advisory group for the CMP update and includes the following jurisdictions/agencies:

- Hernando County Planning Department
- Citrus County Planning Department
- Hernando County Department of Public Works
- Citrus County Public Works Department
- Hernando County School District
- Citrus County School District
- City of Brooksville
- City of Inverness
- City of Crystal River
- Hernando County Transit "The BUS"
- Citrus County Transit

Other stakeholders as the need merits, such as CSX Railroad, goods movement representatives, etc. Typically, these additional members would serve on an ad hoc basis to address specific issues.

The Technical Advisory Committee (TAC)/Transportation Systems Operations Committee (TSOC) convenes for the MPO on CMP related matters. This ensures that CMP issues are addressed routinely as an ongoing activity of the MPO. A key contribution of the Hernando/Citrrus MPO TAC/TSOC is to identify, track, and evaluate potential congestion- or safety-related issues on the roadway network.

CMP Actions/Recommendations

A list of recommendations and actions is presented to enhance the CMP and become more efficient in the overall MPO planning process. The actions/recommendations presented below will be reviewed and considered by MPO staff and the Hernando/Citrus County Congestion Management Plan Task Force for implementation as necessary.

- Update the CMP Policy and Procedures Handbook (CMP Steps 1-3) on a four- to five-year cycle consistent with the update cycle of the LRTP. Timing of the completion of CMP updates in advance of finalizing LRTP updates would benefit integration of CMP strategies into the LRTP.
- Develop an routine State of the System Report to track effectiveness of the implemented strategies, to the extent possible and to evaluate trends and conditions for the multi-modal transportation system in the CMP study area. The annual CMP State of the System Report will include steps 4 through 8 of the CMP process:
  - Step 4: Collect Data/Monitor System Performance
  - Step 5: Analyze Congestion Problems & Needs
  - Step 6: Identify and Assess Strategies
  - Step 7: Implement Selected Strategies
  - Step 8: Monitor Strategy Effectiveness (combined with Step 4)
- Enhance coordination with agencies participating in the CMP by framing desirable strategy types and defining roles in implementation. This is essential, as most congestion and mobility strategies are formulated and implemented by other agencies.
- Projects from the CMP process may identify projects for inclusion in the LRTP either through the four-year update cycle or through plan amendments.
- Identify and implement data collection recommendations on collecting key congestion data as well as closing any data gaps identified in this CMP.
- Perform outreach and education efforts to inform interested parties and stakeholders. These may include:
  - Maintain a CMP page on the MPO website.
  - Develop a brochure and/or newsletter on the CMP and its benefits.
- Continue monitoring changes to federal CMP regulations and modify/update CMP to reflect new requirements.

The general schedule for the development of the annual CMP State-of- the-System-Report is provided below (refer to **Figure 6-1**).

January to May

- Update roadway inventory data to support LOS analysis, travel time reliability, and safety evaualtion.
- Calculate Non-Highway Systemwide Performance Monitoring (Public Transportation, Bicycle, Pedestrian, TDM, etc.).
- Produce growth rates on Hernando and Citrus county roadways using county traffic counts and perform initial LOS analysis (existing conditions +1 year and existing + 5 years).*
- Produce preliminary growth rates on state roadways using older state traffic counts and perform initial LOS analysis (existing conditions and existing +5 years).*

May

- Hold TAC/TSOC meeting to review and identify potential operational issues that would not be identified through the technical screening process.
- Coordinate with goods movement stakeholders and providers to identify related needs (may occur earlier).

May to June

- Receive FDOT traffic counts.
- Produce updated growth rates on state roadways using state traffic counts and perform initial LOS analysis (existing conditions and existing + 5 years).
- Screen corridors (existing conditions and existing + 5 years).
- Select corridors for evaluation.

July

- Report to TAC/TSOC and CAC results of corridor screening and selection.
- Report to TAC/TSOC and CAC results from Non-Highway Systemwide Performance Monitoring (Public Transportation, Bicycle, Pedestrian, TDM, etc.).

July to August

- Identify strategies to be considered on selected corridors
- Evaluate strategies where appropriate and make improvement or program recommendations for implementation
- Report to the TAC/TSOC and CAC recommended strategies for implementation

September to October

- Finalize technical recommendations on strategy implementation.
- Program improvement recommendations in CIE and identify other priority projects or programs for TIP.
- Finalize performance monitoring summary.
- Obtain endorsement from TAC/TSOC and CAC on programmed projects in CIE and priorities for TIP.
- Adopt CMP Project Priority List through Public Hearing of MPO Board.

October to November

- Finalize CMP Annual State-of-the-State Report.

Chapter 3

Goals and Objectives

Chapter 3
Goals and Objectives

Introduction

A series of CMP goals and objectives was developed to guide the process of monitoring congestion and improving the mobility of persons and goods for the area served by the Hernando/Citrus MPO. These were compiled based on the previously adopted CMP goals and objectives developed previously by the Hernando/Citrus MPO and modified based on MAP-21/FAST Act rulemaking associated with performance measurement.

The goals and objectives are presented below. They will be used as a tool for selecting strategies and performance measures for strategy monitoring and evaluation.

CMP Goals and Objectives

GOAL #1: Improve and increase transit as a viable transportation alternative.

Objective 1.1 Improve transit service in congested corridors by increasing service in congested corridors with existing service and implementing service in congested corridors currently not served by transit.

Objective 1.2 Develop multimodal strategies that reduce dependency on the single occupant vehicle (SOV).

Objective 1.3 Increase efficiency of transit system through the use of appropriate new and advanced technologies that are feasible.

GOAL #2: Identify and implement strategies to mitigate congestion and improve the safety and mobility of people and goods and maintain the region's air quality.

Objective 2.1 Identify and implement congestion management strategies to enhance the existing transportation system and relieve congestion, improve travel time reliability, improve safety, and improve mobility of persons and goods, where large capital improvements may not be necessary.

Objective 2.2 Encourage using demand management and/or operations management strategies to solve congestion problems before adding capacity through general purpose lanes or new roadways where these strategies may eliminate the need to construct additional lanes.

Objective 2.3 Increase the efficiency of the transportation system through the use of low-cost TDM alternatives such as carpooling, vanpooling, telecommuting, and flexible work hours.

Objective 2.4 Improve the mobility of people and goods by using strategies in advanced technologies such as Intelligent Transportation Systems (ITS).

GOAL #3: Develop, maintain, and expand bicycle, pedestrian, and multi-use trail facilities for efficient and safe movement of people.

Objective 3.1 Coordinate transit services with bicycle, pedestrian, and multi-use trail improvement projects.

Objective 3.2 Provide for pedestrian, multi-use trail, transit, and bicycle facilities to encourage employees to use these facilities to get to work.

GOAL #4: Integrate CMP and its improvements into the LRTP and TIP and help guide land use policies and land development regulations.

Objective 4.1 Incorporate projects identified through the CMP in the Five-Year TIP.

Objective 4.2 Develop land use policies and land development regulations that support public transit, ridesharing, walking, and bicycling, especially for travel to work.

Chapter 4
Network Identification

Chapter 4
Network Identification

Introduction

This chapter of the CMP component presents an overview of the geographic area of application and the transportation network for the Hernando/Citrus MPO CMP.

Area of Application

The CMP area of application includes the transportation system that needs to be evaluated and monitored and where congestion management policies and procedures need to be applied. The geographic area of application for this CMP Update consists of Hernando and Citrus Counties in their entirety.

Transportation Network

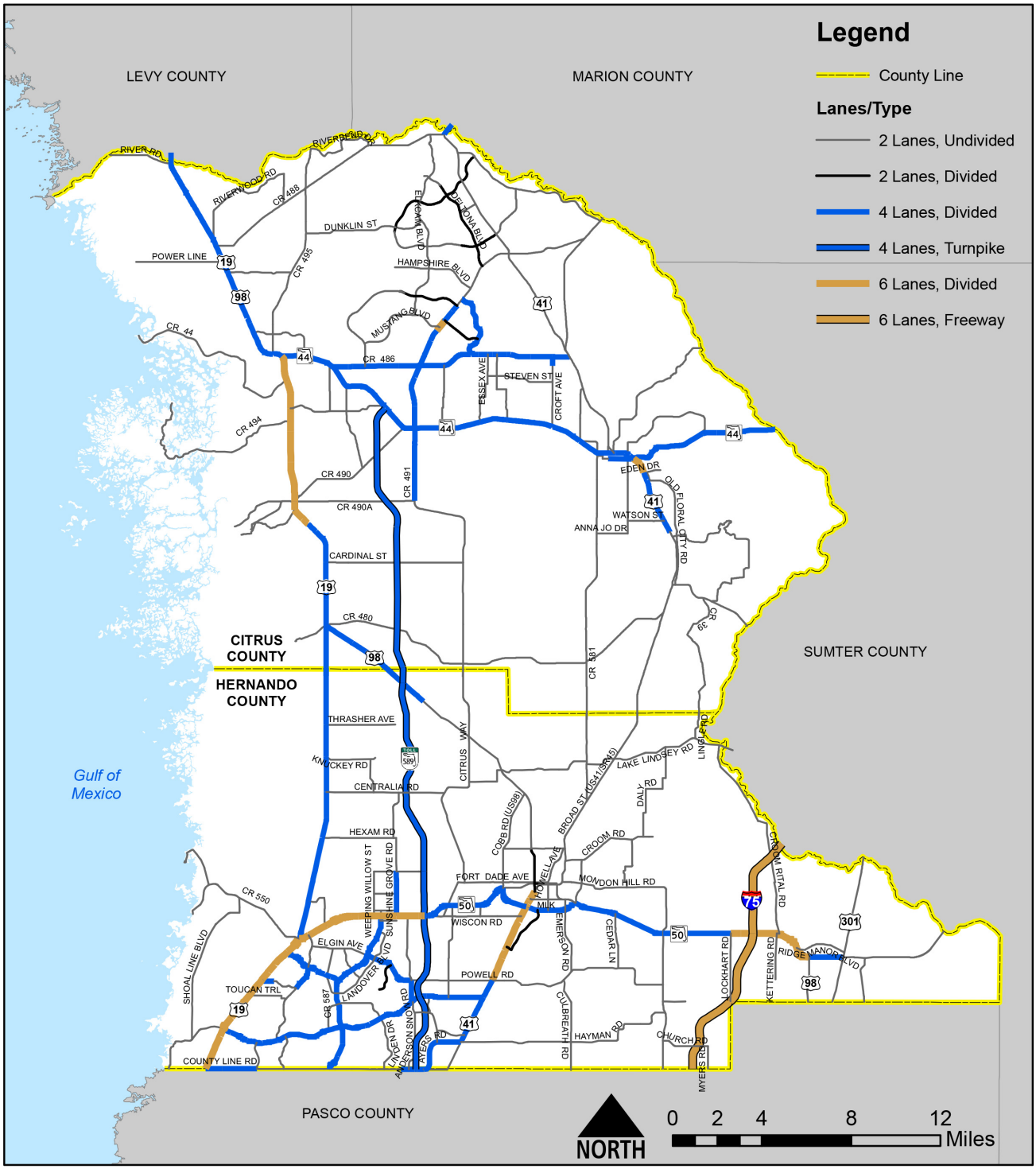
Consistent with federal guidelines, the Hernando/Citrus MPO CMP covers a multimodal transportation network. In addition to evaluating congestion on the roadway network, the Hernando/Citrus MPO CMP Update evaluates transit, bicycle/pedestrian/trail, and freight movement networks within its designated area of application. The CMP roadway network is described below.

Roadway Network

The Hernando/Citrus MPO CMP roadway network includes all functionally classified roadways included in the adopted LRTP and/or the existing plus committed (E+C) five-year road network (typically, the existing condition plus five years). For example, the map in **Figure 4-1** illustrates the existing plus committed roadway network at the time that this handbook was developed and includes roadways through 2016. This represents the study area and network for the Hernando/Citrus MPO CMP.

Chapter 7 provides further information on congested corridors and strategies.

Figure 4-1: Hernando/Citrus County Existing and Committed Projects



Chapter 5 Development of Performance Measures

Chapter 5
Development of Performance Measures

Introduction

Performance measures are used as tools to measure and monitor the effectiveness of the transportation system in the CMP. They assist in identifying and tracking as areas progress in monitoring congestion. However, these measures are dependent upon the transportation network and the availability of data. They typically are used to measure the extent and severity of congestion and for the evaluation of the effectiveness of the implemented strategies.

As identified by FHWA, a set of good performance measures:

- Includes quantifiable data that are simple to present and interpret and have professional credibility,
- Describes existing conditions and can be used to identify problems and to predict changes,
- Can be calculated easily and with existing field data, uses techniques available for estimating the measure, and achieves consistent results, and
- Applies to multiple modes and is meaningful at varying scales and settings.

Performance Measures

The performance measures for the Hernando/Citrus MPO CMP were selected to address the existing conditions for the multimodal network in Hernando and Citrus Counties. The measures are organized into six major categories:

1. Roadway Capacity
2. Roadway Reliability
3. Goods Movement.
4. Public Transit
5. Bicycle/Pedestrian/Multi-Use Trail Facilities
6. Travel Demand Management (TDM)

These performance measures were identified based on numerous monitoring activities currently conducted and/or planned by various local and state agencies responsible for providing or supporting transportation facilities and services in Hernando and Citrus Counties. Detailed descriptions of each of these measures, together with an explanation of how the required data are or will be collected, are presented in the remainder of this chapter.

Safety Performance Measures (5 Year Rolling Average)

- Number of Fatalities
- Fatality Rate
- Serious Injuries
- Serious Injury Rate
- Non-Motorized Safety (Fatalities + Serious Injuries)

Roadway Capacity Performance Measures

- Percent of VMT and Roadway Miles below adopted Level of Service Standard
- V/C Ratio
- V/MSV Ratio

Reliable Travel Time Performance Measures

- Percent of Person-Miles Traveled on the Interstate that Are Reliable
- Percent of Person-Miles Traveled on the Non-Interstate NHS that Are Reliable

Goods Movement Performance Measures

- Vehicle Miles Traveled (VMT) Below LOS Standard on Designated Truck Routes
- Truck Travel Time Reliability (TTTR) Index
- Percent of the Interstate System Mileage Uncongested
- Number of Crashes Involving Heavy Vehicles

Public Transit Performance Measures

- Percent of Congested Roadway Centerline Miles with Transit Service
- Passenger Trips per Revenue Hour
- Average Peak Service Frequency
- On-Time Performance
- Annual Ridership

Bicycle/Pedestrian/Trail Facility Performance Measures

- Percent of Congested Roadway Centerline Miles with Bicycle and/or Sidewalk Facilities
- Miles of Multi-Use Trails

TDM Performance Measures

- Number of Registered Carpools or Vanpools

System Preservation (Optional – Non-CMP)

- Percent of pavements of the Interstate System in Good condition
- Percent of pavements of the non-Interstate NHS in Good condition
- Percent of pavements of the Interstate System in Poor condition
- Percent of pavements of the non-Interstate NHS in Poor condition
- Percent of NHS Bridges Classified as in “Good” Condition
- Percent of NHS Bridges Classified as in “Poor” Condition

Safety Performance Measures (5 Year Rolling Average)

Crashes at intersections and roadway segments are used as an indicator of congestion. Considered a measure of non-recurring congestion, this measure uses data that are widely available through the many local and state agencies that track them on an ongoing basis throughout the CMP application area. All data is collected and summarized in the form of a 5 year rolling average

Number of Fatalities

This is a summary of the number of fatalities from motor vehicle crashes. This is measured by the number of fatalities and not the number of fatality crashes.

Fatality Rate

This is a summary of the number of fatalities from motor vehicle crashes normalized by exposure in the form of vehicle miles of travel (100,000). This is measured by the number of fatalities and not the number of fatality crashes.

Serious Injuries

This is a summary of the number of incapacitating injuries from motor vehicle crashes. This is measured by the number of persons receiving incapacitating injuries and not the number of incapacitating injury crashes.

Serious Injury Rate

This is a summary of the number of incapacitating injuries from motor vehicle crashes normalized by exposure in the form of vehicle miles of travel (100,000). This is measured by the number of persons receiving incapacitating injuries and not the number of incapacitating injury crashes.

Non-Motorized Safety (Fatalities + Serious Injuries)

This is a summary of the number of fatalities and incapacitating injuries from motor vehicle crashes that involve pedestrians or bicyclists. This is measured by the sum of the number of fatalities and incapacitating injuries and not the number of fatality or incapacitating injury crashes.

Data Collection/Availability – Crash data in Hernando and Citrus Counties are collected through various law enforcement Agencies. The data for fatality and incapacitating injury crashes are provided by the FDOT.

Roadway Performance Measures

Percent of Vehicle Miles of Travel (VMT) and Roadway Miles Below the Adopted Level of Service (LOS) Standard

These measures summarize the proportion of vehicle miles of travel and roadway miles below the adopted level of service standard to help quantify the level of congestion within the county.

Data Collection/Availability – Hernando and Citrus Counties collects traffic volume and capacity data and performs LOS analysis on an annual basis for various planning purposes. The County publishes the data into Geographic Information System (GIS) shape files, spreadsheets, and reports once the data are finalized.

V/C Ratio and V/MSV Ratio

The volume-to-capacity (V/C) ratio is used as the major tool in measuring roadway conditions and is a measure of the amount of traffic on a given roadway in relation to the amount of traffic the roadway was designed to handle. The volume to maximum service volume (V/MSV) is used to measure the amount of traffic on a roadway in relation to the adopted acceptable amount of traffic the roadway should handle.

Data Collection/Availability – As mentioned above, Hernando and Citrus Counties collects traffic volume and capacity data and performs LOS analysis on an annual basis for various planning purposes. The County publishes the data into Geographic Information System (GIS) shape files, spreadsheets, and reports once the data are finalized.

Reliable Travel Time Performance Measures

Travel time reliability in Florida's Mobility Performance Measures Program is based on a benchmarking technique and is referred to as the Florida Reliability Method. The Florida Reliability Method was derived from the Department's definition of reliability of a highway system as the percent of travel on a corridor that takes no longer than the expected travel time plus a certain acceptable additional time. In this context, it is necessary to define the three major components of reliability:

1. Travel time - The time it takes a typical commuter to move from the beginning to the end of a corridor. Since speed is determined along each segment as the traveler moves through the corridor, this travel time is a function of both time and distance. This is representative of the typical commuter's experience in the corridor.
2. Expected travel time - The median travel time across the corridor during the time period being analyzed. The median is used rather than the mean so that the value of the expected travel time is not influenced by any unusual major incidents that may have occurred during the sampling period. These major incidents will be accounted for in the percentage of how often the travel takes longer than expected, but will not change the baseline to which that unusually high travel time is being compared.
3. Acceptable additional time- The amount of additional time, beyond the expected travel time, that a commuter would find acceptable during a commute. The acceptable additional time is expressed as a percentage of the expected travel time during the period being analyzed.

Percent of the Interstate System providing for Reliable Travel Times (Not Required)

Percent of the Interstate System providing reliable travel times as reported in Person-Miles. The HRTPO region does not include any Interstate facilities and will not need to report on this measure but will need to document the absence of Interstate facilities.

Percent of the non-Interstate NHS providing for Reliable Travel Times

Percent of the Non-Interstate National Highway System providing reliable travel times as reported in Person-Miles. This will typically only be measured on the State Highway system and a limited number of non-State Highway System facilities.

Data Collection/Availability – Travel Time Reliability Data will be summarized by FDOT for the State Highway System. Data for non-state roadways will only be available on a limited number of roadway corridors and may be of limited quality.

Goods Movement Performance Measures

Vehicle Miles Traveled (VMT) Below LOS Standard on Designated Truck Routes

This measures the total vehicle miles of travel below the adopted LOS standard in Hernando and Citrus Counties on designated truck routes. The VMT for a roadway segment is calculated by multiplying the AADT of that segment by the length of the segment in miles.

Data Collection/Availability – VMT performance data are updated annually by the MPO.

Truck Travel Time Reliability (TTTR) Index

Percent of the NHS providing reliable truck travel times.

Data Collection/Availability – Truck Travel Time Reliability Data will be summarized by FDOT.

Percent of the Interstate System Mileage Uncongested

This measures the total vehicle miles of travel below the adopted LOS standard in Hernando County on Interstate 75.

Data Collection/Availability – Level of service performance data are updated annually by the MPO.

Number of Crashes involving Heavy Vehicles

The number of crashes involving heavy vehicles is considered to be a measure of non-recurring congestion that is often more significant when it involves heavy vehicles. This measure uses data that are widely available through the many local and state agencies that track them on an ongoing basis throughout the CMP application area.

Data Collection/Availability – FDOT has a comprehensive traffic crash database that aids in summarizing roadway traffic crash data. The system specifically provides crash information that is used for the congestion management process.

Bicycle/Pedestrian/Trail Facility Performance Measures

Percent of Congested CMP Roadway Centerline Miles with Bicycle Facilities

This measure identifies the proportion of congested CMP centerline miles where some type of bicycle facility exists, as defined by the respective planning agencies. Some communities consider paved shoulders and wide curb lanes to be bicycle facilities, with the exception of interstates and toll facilities.

Data Collection/Availability – These data are collected and maintained regularly by Hernando/Citrus MPO and summarized in various plans.

Percent of Congested CMP Roadway Centerline Miles with Sidewalk Facilities

The proportion of congested CMP roadway network centerline miles on which a sidewalk is available is measured.

Data Collection/Availability – These data are collected and maintained regularly by Hernando/Citrus MPO and summarized in various plans.

Miles of Multi-Use Trails

This measure summarizes the total number of miles of multi-use trail facilities in Hernando and Citrus Counties. Multi-use trail facilities usually are off-street facilities designated for the exclusive use of non-motorized travel. They may be used by pedestrians, cyclists, wheelchair users, joggers, and other non-motorized users.

Data Collection/Availability – These data are collected and maintained with bicycle and sidewalk facility data in Hernando and Citrus Counties.

TDM Performance Measures

Number of Registered Carpools or Vanpools

This measure in the Hernando/Citrus MPO CMP summarizes the annual number of registered carpools and vanpools in CMP application area. A carpool is defined as a group of two or more people who commute to work or other destinations together in a private vehicle, while a vanpool is typically a prearranged group of 5 to 15 people who share their commute to work.

Data Collection/Availability – Currently, Tampa Bay Area Regional Transportation Authority (TBARTA), through a contracted operator, provides vanpool/carpool services in Hernando and Citrus Counties and neighboring areas. TBARTA maintains data on registered carpool/vanpool users to determine which carpools and vanpools are available them.

System Preservation (Optional – Non-CMP)

Federal legislation (MAP-21 & FAST Act) requires the reporting of pavement conditions and bridge conditions on the National Highway System (NHS). While this is not a CMP related performance measure, it is appropriate to include these performance measures in the CMP Annual State of the System report.

Percent of pavements of the Interstate System in Good condition
Percent of pavements of the non-Interstate NHS in Good condition
Percent of pavements of the Interstate System in Poor condition
Percent of pavements of the non-Interstate NHS in Poor condition
Percent of NHS Bridges Classified as in “Good” Condition
Percent of NHS Bridges Classified as in “Poor” Condition

Data Collection/Availability – Pavement condition data for the Interstate and Non-Interstate National Highway System roadways will be provided by FDOT. Non-State NHS pavement condition data will need to be provided by the appropriate jurisdiction and data availability may be limited. Bridge condition information will be provided by the FDOT for all NHS bridges.

Relationship of Performance Measures to the Goals and Objectives

As part of the CMP process, the performance measures have been related to the goals and objectives discussed earlier in the report. **Table 5-1** illustrates an example of the relationship between the performance measures identified above and the Goals and Objectives for the Congestion Management Process.

Figure 5-1: Relationship of Goals and Objectives to Performance Measures

Goals and Objectives	Performance Measures: Safety Performance Measures (5 Year Rolling Average)					Roadway Capacity Performance Measures			Travel Time Realiabity Performance Measures	
	Number of Fatalities	Fatality Rate	Serious Injuries	Serious Injury Rate	Non-Motorized Safety (Fatalities + Serious Injuries)	Percent of VMT and Roadway Miles below adopted Level of Service Standard	V/C Ratio	V/MSV Ratio	Percent of Person-Miles Traveled on the Interstate that Are Reliable	Percent of Person-Miles Traveled on the Non- Interstate NHS that Are Reliable
GOAL #1: Improve and increase transit as a viable transportation alternative.										
Objective 1.1 Improve transit service in congested corridors by increasing service in congested corridors with existing service and implementing service in congested corridors currently not served by transit.										
Objective 1.2 Develop multimodal strategies that reduce dependency on the single occupant vehicle (SOV).						✓	✓	✓	✓	✓
Objective 1.3 Increase efficiency of transit system through the use of appropriate new and advanced technologies that are feasible.										
GOAL #2: Identify and implement strategies to mitigate congestion and improve the safety and mobility of people and goods and maintain the region's air quality.										
Objective 2.1 Identify and implement congestion management strategies to enhance the existing transportation system and relieve congestion, improve travel time reliability, improve safety, and improve mobility of persons and goods, where large capital improvements may not be necessary.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Objective 2.2 Encourage using demand management and/or operations management strategies to solve congestion problems before adding capacity through general purpose lanes or new roadways where these strategies may eliminate the need to construct additional lanes.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Objective 2.3 Increase the efficiency of the transportation system through the use of low-cost TDM alternatives such as carpooling, vanpooling, telecommuting, and flexible work hours.						✓	✓	✓		
Objective 2.4 Improve the mobility of people and goods by using strategies in advanced technologies such as Intelligent Transportation Systems (ITS).	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GOAL #3: Develop, maintain, and expand bicycle, pedestrian, and multi-use trail facilities for efficient and safe movement of people.										
Objective 3.1 Coordinate transit services with bicycle, pedestrian, and multi-use trail improvement projects.	✓	✓	✓	✓	✓				✓	✓
Objective 3.2 Provide for pedestrian, multi-use trail, transit, and bicycle facilities to encourage employees to use these facilities to get to work.	✓	✓	✓	✓	✓				✓	✓
GOAL #4: Integrate CMP and its improvements into the LRTP and TIP and help guide land use policies and land development regulations.										
Objective 4.1 Incorporate projects identified through the CMP in the Five-Year TIP.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Objective 4.2 Develop land use policies and land development regulations that support public transit, ridesharing, walking, and bicycling, especially for travel to work.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Goals and Objectives	Performance Measures													
	Goods Movement Performance Measures				Public Transit Performance Measures					Bicycle/ Pedestrian/ Trail Facility Performance Measures		TDM Performance Measures	System Preservation (Optional – Non CMP)	
	Vehicle Miles Traveled (VMT) Below LOS Standard on Designated Truck Routes	Truck Travel Time Reliability (TTTR) Index	Percent of the Interstate System Mileage Uncongested	Number of Crashes Involving Heavy Vehicles	Percent of Congested Roadway Centerline Miles with Transit Service	Passenger Trips per Revenue Hour	Average Peak Service Frequency	On-Time Performance	Annual Ridership	Percent of Congested Roadway Centerline Miles with Bicycle and/or Sidewalk Facilities	Miles of Multi-Use Trails	Number of Registered Carpools or Vanpools	Percent of Interstate & Non-Interstate NHS Pavement in Good/Poor Condition	Percent of NHS Bridges in Good/Poor Condition
GOAL #1: Improve and increase transit as a viable transportation alternative.														
Objective 1.1 Improve transit service in congested corridors by increasing service in congested corridors with existing service and implementing service in congested corridors currently not served by transit.					✓	✓	✓	✓	✓					
Objective 1.2 Develop multimodal strategies that reduce dependency on the single occupant vehicle (SOV).					✓	✓	✓	✓	✓	✓	✓			
Objective 1.3 Increase efficiency of transit system through the use of appropriate new and advanced technologies that are feasible.					✓	✓	✓	✓	✓					
GOAL #2: Identify and implement strategies to mitigate congestion and improve the safety and mobility of people and goods and maintain the region's air quality.														
Objective 2.1 Identify and implement congestion management strategies to enhance the existing transportation system and relieve congestion, improve travel time reliability, improve safety, and improve mobility of persons and goods, where large capital improvements may not be necessary.	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Objective 2.2 Encourage using demand management and/or operations management strategies to solve congestion problems before adding capacity through general purpose lanes or new roadways where these strategies may eliminate the need to construct additional lanes.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Objective 2.3 Increase the efficiency of the transportation system through the use of low-cost TDM alternatives such as carpooling, vanpooling, telecommuting, and flexible work hours.												✓		
Objective 2.4 Improve the mobility of people and goods by using strategies in advanced technologies such as Intelligent Transportation Systems (ITS).								✓						
GOAL #3: Develop, maintain, and expand bicycle, pedestrian, and multi-use trail facilities for efficient and safe movement of people.														
Objective 3.1 Coordinate transit services with bicycle, pedestrian, and multi-use trail improvement projects.				✓	✓	✓	✓	✓	✓	✓	✓	✓		
Objective 3.2 Provide for pedestrian, multi-use trail, transit, and bicycle facilities to encourage employees to use these facilities to get to work.					✓	✓	✓	✓	✓	✓	✓	✓		
GOAL #4: Integrate CMP and its improvements into the LRTP and TIP and help guide land use policies and land development regulations.														
Objective 4.1 Incorporate projects identified through the CMP in the Five-Year TIP.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Objective 4.2 Develop land use policies and land development regulations that support public transit, ridesharing, walking, and bicycling, especially for travel to work.				✓	✓	✓	✓	✓	✓	✓	✓	✓		

Chapter 6

System Performance Monitoring Plan

Chapter 6
System Performance Monitoring Plan

Overview of Monitoring Plan

FHWA identifies congestion monitoring as just one of the several aspects of transportation system performance that leads to more effective investment decisions for transportation improvements. Safety, physical condition, environmental quality, economic development, quality of life, and customer satisfaction are among the aspects of performance that also require monitoring.

The Final Rule on Metropolitan Transportation Planning identifies the requirement for "a coordinated program for data collection and system performance monitoring to assess the extent of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions." In addition, it also indicates that "to the extent possible, this data collection program should be coordinated with existing data sources and coordinated with operations managers in the metropolitan area."

As a result, the goal of the Hernando/Citrus MPO CMP system monitoring plan, as presented in **Table 6-1** on the following page, is to develop an ongoing system of monitoring and reporting that relies primarily on data already collected or planned to be collected in the county. The components of the monitoring plan include roadways, public transit, bicycle/pedestrian/trail, TDM, and goods movement where:

- Roadways are monitored through annual LOS analysis using traffic counts and other related data constantly collected throughout the region.
- Crashes are monitored to identify potential non-recurring congestion.
- Transit performance is monitored continuously through various operating and capital plans.
- Bicycle/pedestrian/trail facility data are monitored and updated in various city and county databases.
- Significant goods movement corridors are evaluated to address mobility needs of the goods movement providers.

The Hernando/Citrus MPO CMP will make use of an Annual State of the System Report to document the performance of the transportation system as described in more detail in Chapter 8 of this report.

Table 6-1: System Performance Monitoring Plan

Performance Measure	Monitoring Activity	Responsible Agency	Frequency of Evaluation	Current Status
Level of Service	Level of Service Analysis	Hernando/Citrus MPO/ Cities/FDOT	Annually	Ongoing
Crash Frequency	Crash Data Analysis	Hernando County/ Citrus County	Annually	Ongoing
Travel Time Reliability	Travel Time Reliability Measures	FDOT	Annually	Ongoing
Passenger Trips per Revenue Hour, Average Service Frequency, Annual Ridership	NTD Report/Transit Development Plan	Hernando County/THE BUS	Monthly/Annually	Ongoing
Transit On-time Performance	Transit Quality of Service Evaluation	Citrus County Transit	Annually	Ongoing
Miles of Bicycle, Pedestrian, and Trail Facilities	Bicycle/Pedestrian/Trail Plans and Databases	Hernando/Citrus MPO	Annually	Ongoing
Number of Registered Carpools or Vanpools	Annual Reports and Interim Summaries by TBARTA.	TBARTA	Monthly/Annually	Ongoing
Truck VMT	Roadway Databases and LRTP	FDOT	Annually	Ongoing

The Hernando/Citrus MPO, as part of the system monitoring plan, will update the State of the System Report annually. Each year, the MPO will develop a preliminary congestion map early in the year and a final congestion map towards the end of the year. The process is summarized below.

- Between January and June, preliminary existing and five-year networks will be developed using the most recent County counts and the latest available FDOT counts, which will be behind the County counts. These networks will be used to create a preliminary congestion map.
- Between July and November, final existing and five-year networks will be developed once the latest FDOT counts have been received These networks will be used to create a final congestion map.

Chapter 7 Congested Corridor Selection and CMP Strategies

Chapter 7
Congested Corridor Selection and CMP Strategies

Implementation

This section summarizes the implementation and management of the CMP strategies. This includes the process for selecting corridors and projects for implementation in the future as well as an implementation schedule, implementation responsibilities, costs, and possible funding sources for each strategy currently proposed for implementation.

Congested Corridor Selection and Project Selection Process

The purpose of the CMP is to identify actual projects. The CMP process involves selecting congested corridors that will undergo detailed evaluation for identifying potential projects/programs that can be potentially implemented on the corridors. The process follows three phases (an overview illustration is provided in **Figure 7-1**):

Congested Corridor Network Identification (Phase 1)

Annual monitoring efforts are used to review the level of service on the roadway network to identify recurring congestion. Roadways that are congested today or forecasted to be congested in five years are considered for review through the CMP screening process. Corridors are identified as being "not congested," "approaching congestion or minimally congested," or "extremely congested," as summarized below (additional detail is provided in Appendix A).

- **Not Congested (currently or in five years without improvements):** Corridors that are not anticipated to operate below their adopted level of service standards in either the existing conditions or after committed improvements in the five-year program are implemented.
- **Approaching Congestion or Minimally Congested:** Corridors that are approaching congestion or are minimally congested based on one of the following three criteria (projects on these corridors may have the greatest impact):
  - ***Approaching Congestion*** – Corridors that are not congested but have segments that have traffic volumes that consume more than 90% of the roadway's capacity at the adopted level of service standard with either the existing conditions or forecasted five-year condition without improvement.
  - ***Congested Today*** – Existing corridors with traffic volumes that exceed the adopted level of service standard that do not exceed the physical capacity of the roadway.
  - ***Congestion in 5 Years*** – Corridors forecasted in five years to have traffic volumes that exceed the adopted level of service standard that do not exceed the physical capacity of the roadway.
- **Extremely Congested:** Roadways in the Existing + Committed (E+C) five-year network that have forecast volumes that are greater than the physical capacity (typically occurs when using detailed analysis and the volume-to-capacity ratio is 1.08 or greater) of the roadway and are considered severely congested.

Crash data management systems also are used to identify corridors or intersections with a high frequency of crashes that result in non-recurring congestion. Safety improvements not only reduce the potential harm to persons in our communities but also can reduce congestion.

Generally, non-congested corridors do not need to be addressed by the CMP; however, the other two categories typically will require one or more congestion-relieving strategies (project, mobility improving program, etc.). Extremely congested corridors typically will require either capacity improvements or a shift to other mobility strategies that rely significantly on public transportation or reductions in travel demand. In some cases, extremely congested corridors may respond favorably to the implementation of operational improvements; these would be considered on a case-by-case basis where appropriate. The corridors approaching congested or minimally congested typically represent the corridors that will be most responsive to CMP improvement strategies.

After the congested network and corridors have been identified, two to three corridors are selected for detailed analysis and project identification and implementation. The TAC/TSOC reviews the selection of corridors. Once corridors are selected and evaluated, they will not be reevaluated for three to five years. Corridors typically are selected based on the following:

1. If they are not in the 5-year work program or identified as projects in the 10-year plan and the corridors are forecasted to operate below their adopted level of service standard.
2. The two or three corridors that would receive the greatest mobility or operational benefit from the CMP process.
3. Roadways identified as Long Term Concurrency Roadways using mobility strategies that would be strengthened through the implementation of mobility improvements.

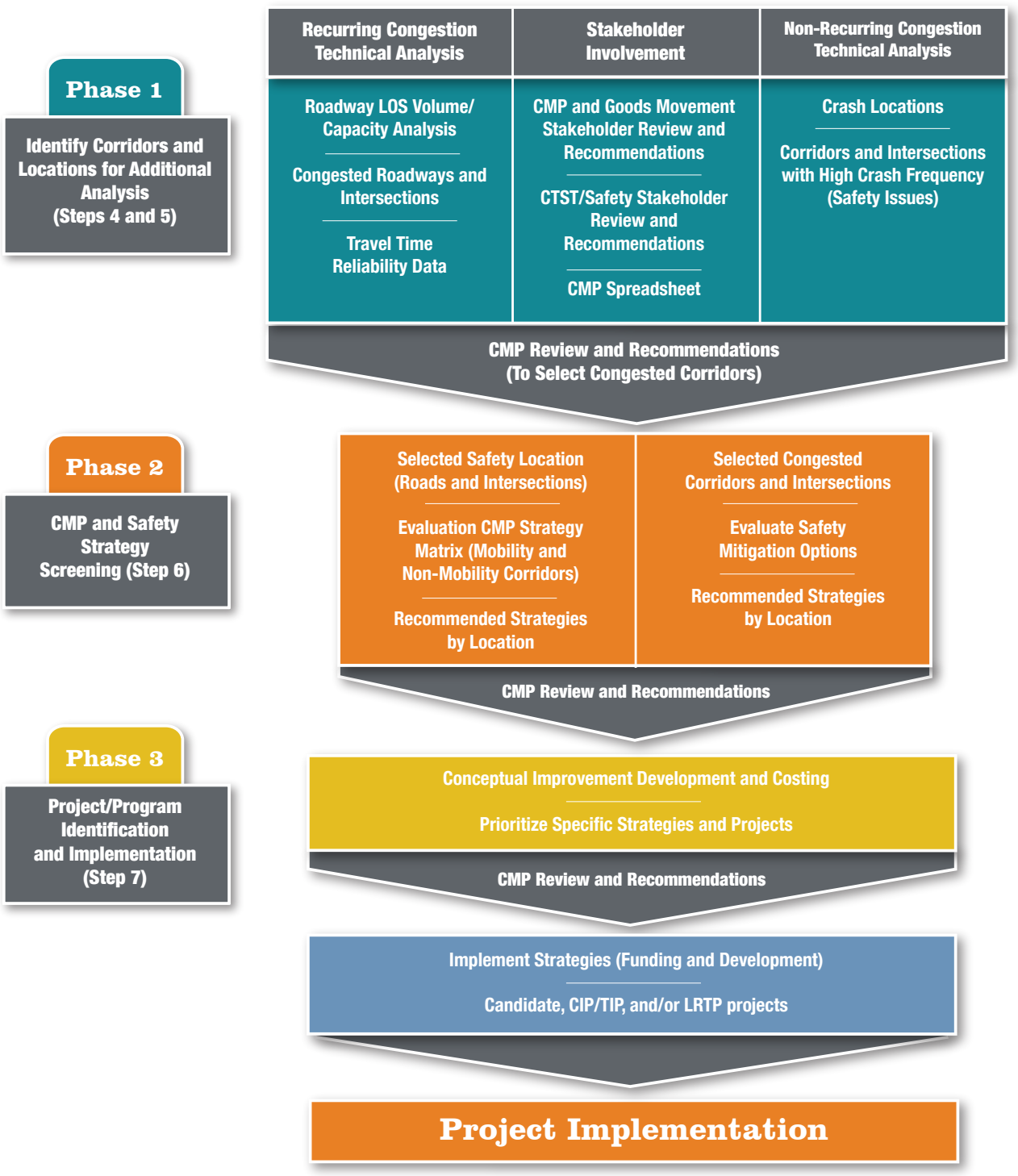
CMP and Safety Strategy Screening (Phase 2)

Once congested corridors are selected for review, they are screened to identify mitigation strategies appropriate to reduce congestion or improve safety to reduce crashes. The CMP Strategy Matrix (found in **Appendix B**) is used to address recurring congestion, and the Safety Mitigation Strategy Matrix (found in **Appendix C**) is used to address nonrecurring congestion. The matrix includes strategies in five tiers as identified in the Hernando/Citrus MPO CMP Strategy Toolbox. The CMP Strategy Matrix typically is used in a workshop setting to quickly review a corridor, and the Safety Mitigation Strategy Matrix is applied based on a review of crash data. Corridors may also be evaluated using the included Complete Streets Matrix (found in **Appendix D**).

Project and Identification and Implementation (Phase 3)

The congestion or safety mitigation strategies that are identified as having the greatest potential benefit are then evaluated in greater detail based on committee or technical recommendations. During this phase, additional analysis of potential projects is undertaken to identify the specific improvement, implementation issues, and costs. “Programs” such as demand-reducing programs or policy changes are evaluated to identify recommended action items. Recommendations then are made for the projects or programs to be implemented. This may result in a near-immediate refocusing of existing resources, such as existing rideshare programs or local maintenance crews where possible, programming improvements in the local agency capital improvement programs, or using boxed funds controlled by the MPO, and finally may be identified as candidate projects for implementation in future LRTPs.

Figure 7-1: Corridor/Strategy Selection Process



Congestion Management Strategies

This section of the CMP Update identifies and evaluates the strategies intended for mitigating existing and future congestion in the Hernando/Citrus MPO roadway network. A Toolbox of Strategies is presented to help policy makers and planners effectively use these congestion reduction strategies. For MPOs with more than 200,000 people within their planning areas, SAFETEA-LU requires that the MPO "shall address congestion management … through the use of travel demand reduction and operational management strategies." In addition, the Final Rule on Statewide and Metropolitan Transportation Planning published on February 14, 2007, states that "development of a congestion management process should result in multimodal system performance measures and strategies that can be reflected in the metropolitan transportation plan and the Transportation Improvement Program (TIP)."

A full range of potential strategies has been identified for the Hernando/Citrus MPO in its multimodal CMP network. These strategies can be grouped into the following broad categories as presented in **Figure 7-2**.

Figure 7-3 summarizes the demand and operational management strategies included in the Hernando/Citrus MPO CMP toolbox of strategies, which is presented later in detail. A full range of demand and operational management strategies are identified in these tables for the MPO to assist in its efforts to mitigating existing and future congestion.

Figure 7-2: Congestion Management Strategies

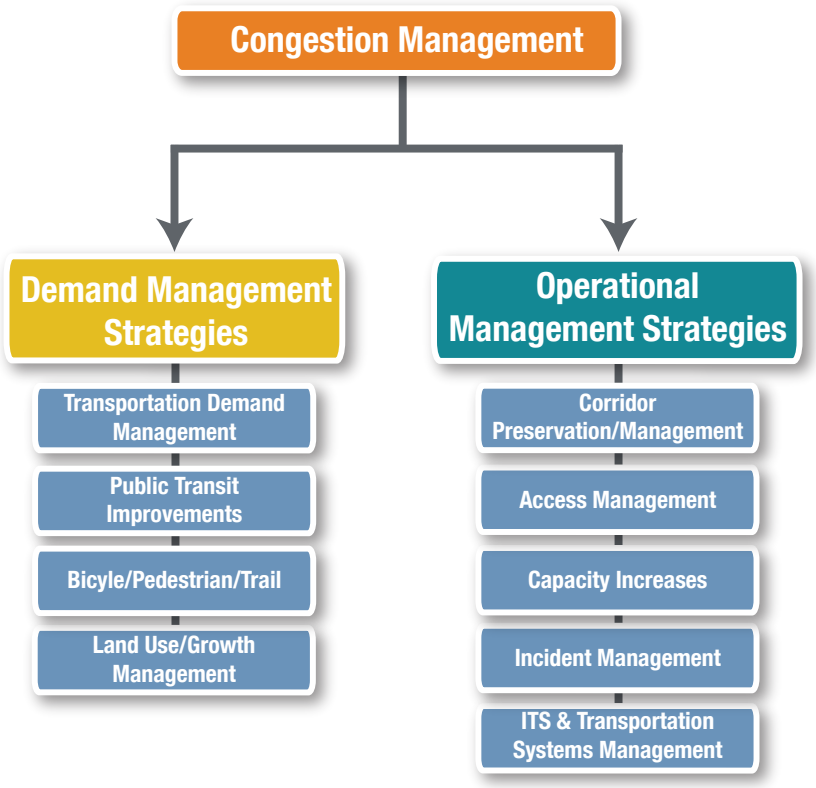
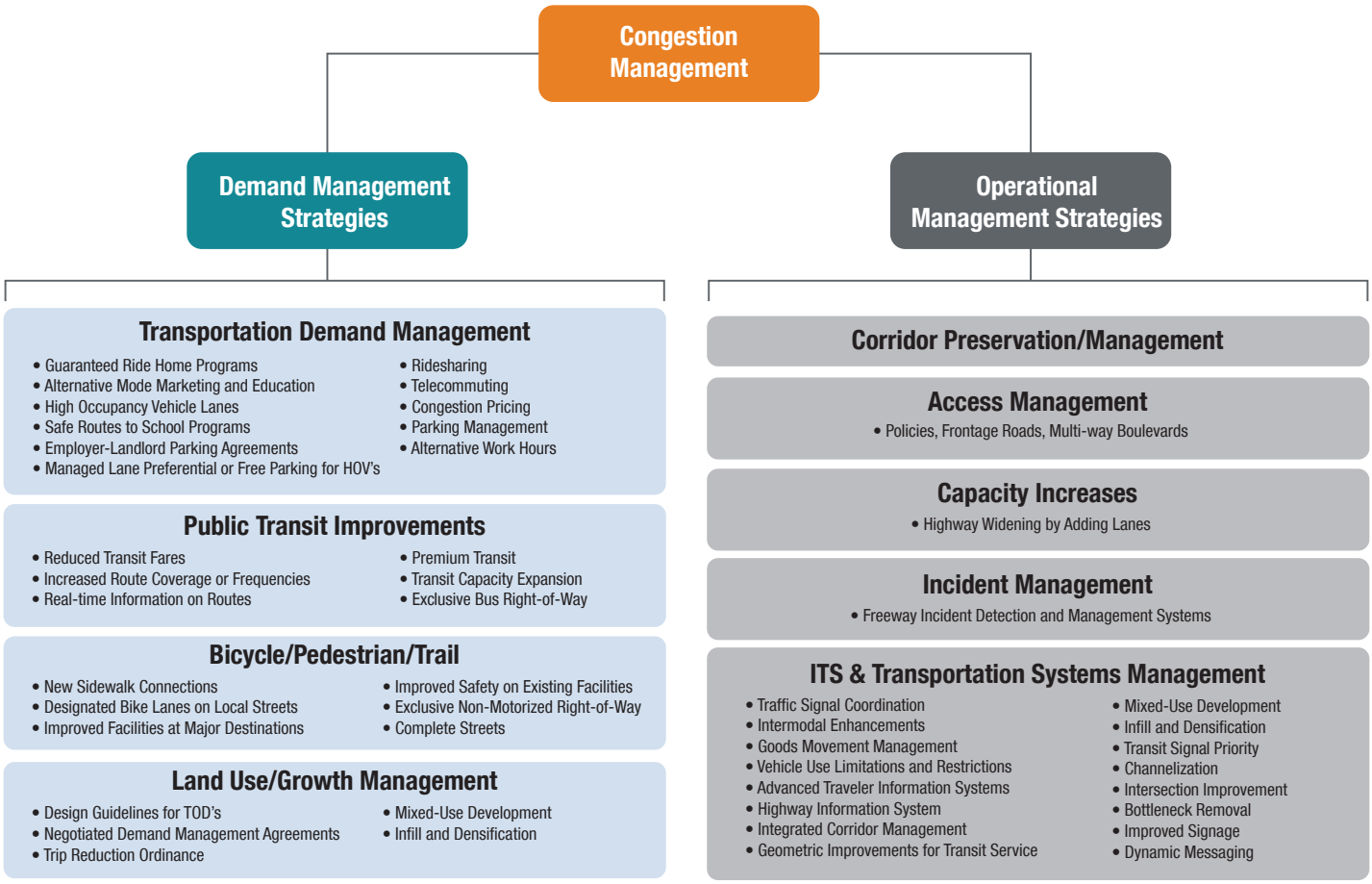


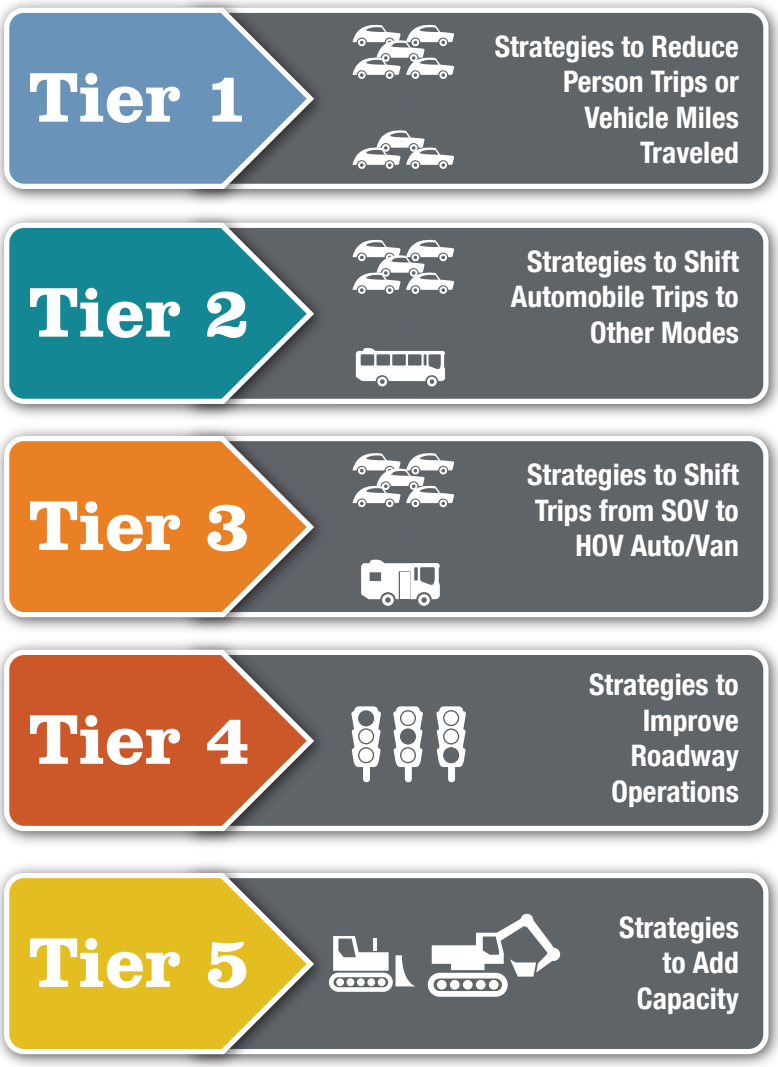
Figure 7-3: Demand and Operational Management Strategies



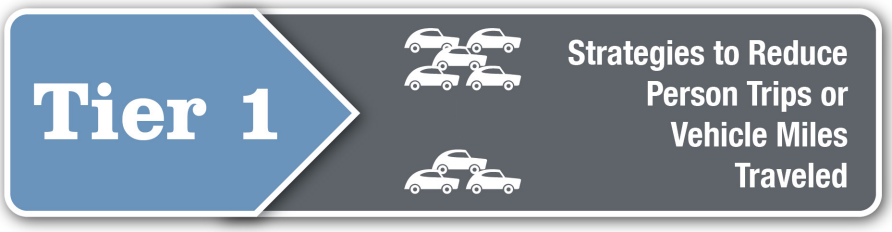
Toolbox of Strategies

The CMP uses a strategy toolbox with multiple tiers of strategies to support the congestion strategy or strategies for congested corridors. Following an approach used by other MPOs and promoted by FHWA, the toolbox of congestion mitigation strategies is arranged so that the measures at the top take precedence over those at the bottom. The toolbox is presented below.

Figure 7-4: Congestion Management Toolbox



The "top-down" approach promotes the growing sentiment in today's transportation planning arena and follows FHWA's clear direction to consider all available solutions before recommending additional roadway capacity. The Hernando/Citrus MPO CMP toolbox of strategies is presented in detail in the remainder of this section.



Transportation Demand Management Strategies

These strategies are used to reduce the use of single occupant motor vehicles, as the overall objective of TDM is to reduce the miles traveled by automobile. The following TDM strategies, not in any particular order, are available for consideration in the toolbox to potentially reduce travel in the peak hours. Strategies include:

- **Congestion Pricing:** Congestion pricing can be implemented statically or dynamically. Static congestion pricing requires that tolls are higher during traditional peak periods. Dynamic congestion pricing allows toll rates to vary depending upon actual traffic conditions. The more congested the road, the higher the cost to travel on the road. Dynamic congestion pricing works best when coupled with real-time information on the availability of other routes.
- **Alternative Work Hours:** There are three main variations: staggered hours, flex-time, and compressed work weeks. Staggered hours require employees in different work groups to start at different times to spread out their arrival/departure times. Flex-time allows employees to arrive and leave outside of the traditional commute period. Compressed work weeks involve reducing the number of days per week worked while increasing the number of hours worked per day.
- **Telecommuting:** Telecommuting policies allow employees to work at home or a regional telecommute center instead of going into the office, all the time or only one or more days per week.
- **Guaranteed Ride Home Programs:** These programs provide a safety net to those people who carpool or use transit to work so that they can get to their destination if unexpected work demands or an emergency arises.
- **Alternative Mode Marketing and Education:** Providing education on alternative modes of transportation can be an effective way of increasing demand for alternative modes. This strategy can include mapping Websites that compute directions and travel times for multiple modes of travel.
- **Safe Routes to Schools Program:** This federally-funded program provides 100 percent funding to communities to invest in pedestrian and bicycle infrastructure surrounding schools.
- **Preferential or Free Parking for HOVs:** This program provides an incentive for employees to carpool with preferred of free-of-charge parking for HOVs.

Land Use/Growth Management Strategies

The strategies in this category include policies and regulations that would decrease the total number of auto trips and trip lengths while promoting transit and non-motorized transportation options. These strategies include the following.

- **Negotiated Demand Management Agreements:** As a condition of development approval, local governments require the private sector to contribute to traffic mitigation agreements. The agreements typically set a traffic reduction goal (often expressed as a minimum level of ridesharing participation or a stipulated reduction in the number of automobile trips).
- **Trip Reduction Ordinance:** These ordinances use a locality's regulatory authority to limit trip generation from a development. They spread the burden of reducing trip generation among existing and future developments better than Negotiated Demand Management Agreements.
- **Infill Developments:** This strategy takes advantage of infrastructure that already exists, rather than building new infrastructure on the fringes of the urban area.
- **Transit Oriented Developments:** This strategy clusters housing units and/or businesses near transit stations in walkable communities. By providing convenient access to alternative modes, auto dependence can be reduced.
- **Design Guidelines for Pedestrian-Oriented Development:** Maximum block lengths, building setback restrictions, and streetscape enhancements are examples of design guidelines that can be codified in zoning ordinances to encourage pedestrian activity.
- **Mixed-Use Development:** This strategy allows many trips to be made without automobiles. People can walk to restaurants and services rather than use their vehicles.

Public Transit Strategies

Two types of strategies, capital improvements and operating improvements, are used to enhance the attractiveness of public transit services to shift auto trips to transit. Transit capital improvements generally modernize the transit systems and improve their efficiency; operating improvements make transit more accessible and attractive. The following strategies are included in the toolbox for consideration.

- **Transit Capacity Expansion:** This strategy adds new vehicles to expand transit services.
- **Increasing Bus Route Coverage or Frequencies:** This strategy provides better accessibility to transit to a greater share of the population. Increasing frequency makes transit more attractive to use.

- **Implementing Regional Premium Transit:** Premium transit such as Bus Rapid Transit (BRT) best serves dense urban centers where travelers can walk to their destinations. Premium regional transit from suburban areas can sometimes be enhanced by providing park-and-ride lots.
- **Providing Real-Time Information on Transit Routes:** Providing real-time information on bus progress either at bus stops, terminals, and/or personal wireless devices makes bus travel more attractive.
- **Reducing Transit Fares:** This relatively easy-to-implement strategy encourages additional transit use, to the extent that high fares are a real barrier to transit. However, due to the direct financial impact on the transit system operating budgets, reductions in selected fare categories may be a more feasible strategy to implement.
- **Provide Exclusive Bus Right-Of-Way**: Exclusive right-of-way includes bus ways, bus-only lanes, and bus bypass ramps. This strategy is applied to freeways and major highways that have routes with high ridership.

Non-Motorized Transportation Strategies

Non-motorized strategies include bicycle, pedestrian, and trail facility improvements that encourage non-motorized modes of transportation instead of single-occupant vehicle trips. The following strategies are included.

- **New Sidewalk Connections**: Increasing sidewalk connectivity encourages pedestrian traffic for short trips.
- **Designated Bicycle Facilities on Local Streets**: Enhancing the visibility of bicycle facilities increases the perception of safety. In many cases, bicycle lanes can be added to existing roadways through restriping.
- **Improved Bicycle Facilities at Transit Stations and Other Trip Destinations**: Bicycle racks and bicycle lockers at transit stations and other trip destinations increase security. Additional amenities such as locker rooms with showers at workplaces provide further incentives for using bicycles.
- **Improved Safety of Existing Bicycle and Pedestrian Facilities**: Maintaining lighting, signage, striping, traffic control devices, and pavement quality and installing curb cuts, curb extensions, median refuges, and raised crosswalks can increase bicycle and pedestrian safety.
- **Exclusive Non-Motorized ROW**: Abandoned rail rights-of-way and existing parkland can be used for medium- to long-distance bicycle trails, improving safety and reducing travel times.
- **Complete Streets**: Routinely designing and operating the entire right-of-way can enable safe access for all users including pedestrians, bicyclists, motorists, and transit. Elements that may be found on a complete street include sidewalks, bike facilities, special bus lanes, comfortable and accessible transit stops, frequent crossing opportunities, median islands, accessible pedestrian signals, curb extensions, support for changing mobility technologies, and more.

Transportation Demand Management Strategies

The following TDM strategies are recommended to encourage HOV use.

- **Ridesharing (Carpools & Vanpools)**: In ridesharing programs, participants are matched with potential candidates for sharing rides. This typically is arranged/encouraged through employers or transportation management agencies that provide ride-matching services. These programs are more effective if combined with HOV lanes, parking management, guaranteed ride home policies, and employer-based incentive programs.
- **High Occupancy Vehicle Lanes**: This increases corridor capacity while, at the same time, providing an incentive for single-occupant drivers to shift to ridesharing. These lanes are most effective as part of a comprehensive effort to encourage HOVs, including publicity, outreach, park-and-ride lots, rideshare matching services, and employer incentives.
- **Park-and-Ride Lots**: These lots can be used in conjunction with HOV lanes and/or express bus services. They are particularly helpful when coupled with other commute alternatives such as carpool/vanpool programs, transit, and/or HOV lanes.
- **Employer-Landlord Parking Agreements**: Employers can negotiate leases so that they pay for parking spaces used only by employees. In turn, employers can pass along parking savings by purchasing transit passes or reimbursing nondriving employees with the cash equivalent of a parking space.
- **Parking Management**: This strategy reduces the instance of free parking to encourage other modes of transportation. Options include reducing the minimum number of parking spaces required per development, increasing the share of parking spaces for HOVs, introducing or raising parking fees, providing cash-out options for employees not using subsidized parking spaces, and expanding parking at transit stations or park-and-ride lots.
- **Managed Lanes**: FHWA defines managed lanes as highway facilities or a set of lanes in which operational strategies are implemented and managed (in real time) in response to changing conditions. Examples of managed lanes may include high-occupancy toll (HOT) lanes with tolls that vary based on demand, exclusive bus-only lanes, HOV and clean air and/or energy-efficient vehicle lanes, and HOV lanes that could be changed into HOT lanes in response to changing levels of traffic and roadway conditions.

Tier 4

Strategies to Improve Roadway Operations

Intelligent transportation Systems (ITS) Strategies

The strategies in ITS use new and emerging technologies to mitigate congestion while improving safety and environmental impacts. Typically, these systems are made up of many components, including sensors, electronic signs, cameras, controls, and communication technologies. ITS strategies are sets of components working together to provide information and allow greater control of the operation of the transportation system. The following strategies are included in the toolbox.

- **Dynamic Messaging**: Dynamic messaging uses changeable message signs to warn motorists of downstream queues; it provides travel time estimates, alternate route information, and information on special events, weather, or accidents.
- **Advanced Traveler Information Systems (ATIS)**: ATIS provide an extensive amount of data to travelers, such as real-time speed estimates on the Web or over wireless devices and transit vehicle schedule progress. It also provides information on alternative route options.
- **Integrated Corridor Management (ICM)**: This strategy, built on an ITS platform, provides for the coordination of the individual network operations between parallel facilities creating an interconnected system. A coordinated effort between networks along a corridor can effectively manage the total capacity in a way that will result in reduced congestion.
- **Transit Signal Priority (TSP)**: This strategy uses technology located onboard transit vehicles or at signalized intersections to temporarily extend green time, allowing the transit vehicle to proceed without stopping at a red light.

Transportation Systems Management Strategies

Transportation Systems Management (TSM) strategies identify operational improvements to enhance the capacity of the existing system. These strategies typically are used together with ITS technologies to better manage and operate existing transportation facilities. The following strategies are included in the toolbox.

- **Traffic Signal Coordination**: Signals can be pre-timed and isolated, pre-timed and synchronized, actuated by events (such as the arrival of a vehicle, pedestrian, bus or emergency vehicle), set to adopt one of several pre-defined phasing plans based on current traffic conditions, or set to calculate an optimal phasing plan based on current conditions.
- **Channelization**: This strategy is used to optimize the flow of traffic for making left or right turns usually using concrete islands or pavement markings.
- **Intersection Improvements**: Intersections can be widened and lanes restriped to increase intersection capacity and safety. This may include auxiliary turn lanes (right or left) and widened shoulders.

- **Bottleneck Removal**: This strategy removes or corrects short, isolated, and temporary lane reductions, substandard design elements, and other physical limitations that form a capacity constraint that results in a traffic bottleneck.
- **Vehicle Use Limitations and Restrictions**: This strategy includes all-day or selected time-of-day restrictions of vehicles, typically trucks, to increase roadway capacity.
- **Improved Signage**: Improving or removing signage to clearly communicate location and direction information can improve traffic flow.
- **Geometric Improvements for Transit**: This strategy includes providing for transit stop locations that do not affect the flow of traffic, improve sight lines, and improve merging and diverging of buses and cars.
- **Intermodal Enhancements**: Coordinating modes makes movement from one mode to the other easier. These enhancements typically include schedule modification to reduce layover time or increase the opportunity for transfers, creation of multimodal facilities, informational kiosks, and improved amenities at transfer locations.
- **Goods Movement Management**: This strategy restricts delivery or pickup of goods in certain areas to reduce congestion.

Incident Management Strategies

- **Freeway Incident Detection and Management Systems**: This strategy addresses primarily non-recurring congestion, typically includes video monitoring and dispatch systems, and may also include roving service patrol vehicles.

Access Management Strategies

- **Access Management Policies**: This strategy includes adoption of policies to regulate driveways and limit curb cuts and/or policies that require continuity of pedestrian, bicycle, and trail facilities.

Corridor Preservation/Management Strategies

- **Corridor Preservation**: This strategy includes implementing, where applicable, land acquisition techniques such as full title purchases of future rights-of-way and purchase of easements to plan proactively in anticipation of future roadway capacity demands.
- **Corridor Management**: This strategy is applicable primarily in moderate- to high-density areas and includes strategies to manage corridor rights-of-way. The strategies range from land-use regulations to landowner agreements such as subdivision reservations, which are mandatory dedications of portions of subdivided lots that lie in the future right-of-way.

Tier 5

Strategies to Add Capacity

Strategies to add capacity are the most costly and least desirable strategies and should be considered last resort methods for reducing congestion. As the strategy of cities trying to "build" themselves out of congestion has not provided the intended results, capacity-adding strategies should be applied after determining the demand and operational management strategies identified earlier are not feasible solutions. The key strategy is to increase the capacity of congested roadways through additional general purpose travel lanes.

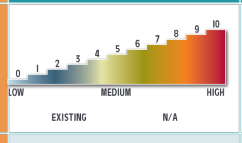
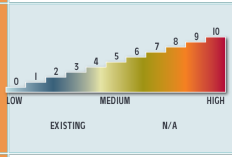
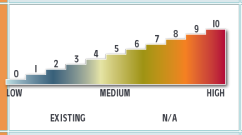
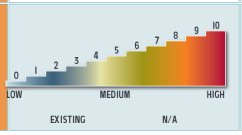
- **Increase the capacity of congested roadways through additional general purpose travel lanes.**

Congestion Mitigation Matrix

The CMP Strategy Matrix is used to address recurring congestion. The first page of the matrix is shown in **Figure 7-5** and the complete matrix is included in **Appendix B**. The matrix includes strategies in five tiers as identified in the CMP Strategy Toolbox. The CMP Strategy Matrix typically is used in a workshop setting with agency stakeholders to quickly screen through the strategies in order to identify appropriate strategies that may provide a benefit within the corridor. Following the screening of a corridor using the matrix, strategies which were identified as having a high level of potential benefit or medium level of potential benefit are considered for additional analysis where appropriate. The CMP Strategy Matrix identifies the general level of applicability by mode given the different trip types as follows:

- **Regional Trips**: Long distance trips and/or pass-through trips through the county. Typically these trips are auto dependent unless served by premium transit modes.
- **Regional Access Trips**: Moderate distance trips that have at least one trip end (origin or destination) within the corridor. Typically, these trips are auto dependent unless served by a mix of premium or fixed route transit.
- **Local Access Trips**: These are shorter trips with at least one trip end within the corridor. Typically transit and bicycle modes can compete favorably with the auto modes of travel relative to travel time.
- **Local Circulation Trips**: These are very short trips where both trip ends likely occur within close proximity to the corridor. Typically, walking and bicycling have travel times comparable to auto usage. Public transportation is typically not viable in the absence of frequent local circulator transit service since walking times are of relatively short duration.

Figure 7-5: Congestion Mitigation Matrix

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types				Potential Effectiveness	Recommendations/ Comments
			Regional Traffic	Regional Access	Local Access	Local Circulation		
Strategies to Reduce Person Trips or Vehicle Miles Traveled	LT	**1.01 Congestion Pricing:** Congestion pricing can be implemented statically or dynamically. Static congestion pricing requires that tolls are higher during traditional peak periods. Dynamic congestion pricing allows toll rates to vary depending upon actual traffic conditions. The more congested the road, the higher the cost to travel on the road. Dynamic congestion pricing works best when coupled with real-time information on the availability of other routes.						
	ST/LT	**1.02 Alternative Work Hours:** There are three main variations: staggered hours, flex-time, and compressed work weeks. Staggered hours require employees in different work groups to start at different times to spread out their arrival/departure times. Flex-time allows employees to arrive and leave outside of the traditional commute period. Compressed work weeks involve reducing the number of days per week worked while increasing the number of hours worked per day.						
	ST/LT	**1.03 Telecommuting:** Telecommuting policies allow employees to work at home or a regional telecommute center instead of going into the office, all the time or only one or more days per week.						
	ST/LT	**1.04 Emergency Ride Home Programs:** These programs provide a safety net to those people who carpool or use transit to work so that they can get to their destination if unexpected work demands or an emergency arises.						

CMP Safety Mitigation Matrix

The Hernando/Citrus MPO CMP process also includes a "CMP Safety Mitigation Matrix" for use in streamlining the identification of potential safety issues identified in the identification of congested corridors by making use of crash data produced by the FDOT's Crash Data Management System (CDMS). This system produces maps and reports by crash type or cause which can be used to identify safety issues on the major roadway network for both congested and non-congested roadways. Reducing the number of crashes that occur on major roadways can reduce nonrecurring congestion. While the delay incurred resulting from crashes cannot be determined easily, it is a significant contribution of delay on major roadways. To support the integration of crash reduction as a means to reduce non-reoccurring congestion, a CMP Safety Mitigation Matrix was developed.

The CMP Safety Migration Matrix is provided in **Appendix C**. This Matrix is similar to the CMP Strategy Matrix in that it should be used to screen and identify potential strategies that would reduce congestion caused by specific crash types. The Matrix identifies crash types and the typical strategies that could be implemented to improve safety and reduce these crashes for the Safety Emphasis Areas identified in the State of Florida Strategic Highway Safety Plan. In most cases, additional detailed study will be required to identify the specific safety strategy or strategies to be implemented for a specific location.

Figure 7-6: Safety Mitigation Matrix

Key Safety Emphasis Areas for CMP Integration		
Community Traffic Safety Program	**Comprehensive Traffic Enforcement and Education Program**	**Motorcycle Safety Program**
Community Traffic Safety teams are multidisciplinary efforts (engineering, law enforcement, education, etc.) who work together to target community specific traffic safety issues.	The Comprehensive Traffic Enforcement and Education Program involves the aggressive enforcement of traffic laws in the following priority areas: Distracted Driving, Impaired Driving, Motorcycle Safety, Occupant Protection and Child Passenger Safety, Pedestrian and Bicycle Safety, Speed/Aggressive Driving, and Teen Driving. Comprehensive projects are funded in communities with a significant number of serious injuries and fatalities that are linked to priority traffic safety areas. Focusing on enhanced enforcement and educational efforts that support critical traffic laws, these efforts will reduce crashes and save lives. Goals of the program are to increase awareness, education, and enforcement of key traffic safety laws that will contribute to a minimum 5 percent annual reduction in fatalities.	This program area addresses crashes involving motorcyclists which is a significant cause of traffic fatalities in Florida.
Potential Strategies	**Potential Strategies**	**Potential Strategies**
■ Increase public awareness and highway traffic safety programs ■ Expand the network of concerned individuals to build recognition and awareness about traffic safety ■ Support initiatives that enhance traffic laws and regulations related to safe driving	■ Increase public awareness of highway traffic safety programs ■ Expand the network of concerned stakeholders to build recognition and awareness of traffic safety ■ Support initiatives that enhance traffic safety laws and regulations related to safe driving ■ Support and promote effective law enforcement efforts related to safe driving	■ Collect and analyze data on motorcycle crashes, injuries, and fatalities to provide local and state agencies with the best available data to make appropriate and timely decisions that improve motorcycle safety in Florida ■ Manage motorcycle safety activities in Florida as part of a comprehensive plan that includes centralized program planning, implementation, coordination, and evaluation to maximize the effectiveness of programs and reduce duplication of effort ■ Promote personal protective gear and its value in reducing motorcyclist injury levels and increasing rider conspicuity ■ Ensure persons operating a motorcycle on public roadways hold an endorsement specifically authorizing motorcycle operation ■ Promote adequate rider training and preparation to new and experienced motorcycle riders by qualified instructors at State-approved training centers ■ Reduce the number of alcohol, drug, and speed-related motorcycle crashes in Florida ■ Support legislative initiatives that promote motorcycle safety-related traffic laws and regulations ■ Ensure State and local motorcycle safety programs include law enforcement and emergency services components ■ Incorporate motorcycle-friendly policies and practices into roadway design, traffic control, construction, operation, and maintenance ■ Increase the visibility of motorcyclists by emphasizing rider conspicuity and motorist awareness of motorcycles ■ Develop and implement communications strategies that target high-risk populations and improve public awareness of motorcycle crash problems and programs

Complete Streets Matrix

The 2017 update of the Hernando/Citrus MPO's CMP establish a vision and framework for the development of "Complete Streets" projects in Hernando and Citrus Counties. Complete Streets are streets that accommodate the needs of all modes of travel and all types of users. In many cases, this effort serves to improve balance in transportation solutions, especially in cases where only the automobile mode may currently be accommodated despite a demonstrated need on the part of other users such as pedestrians, bicyclists, and transit users. The Hernando/Citrus MPO's Congestion Management Process takes into consideration complete streets strategies on appropriate corridors where complete streets policies are being applied. A Complete Streets Matrix has been developed to support the application of complete streets principles to corridors being reviewed similar to the use and application of the CMP Matrix discussed above. The Complete Streets Strategy Matrix can be found in **Appendix D**. This matrix identifies detailed strategies at the travel way, side street, and intersection level that may be considered on complete street corridors.

Figure 7-7: Complete Streets Matrix

Tier	Strategy #	Strategy	Modal Benefit				Potential Effectiveness	Recommendations/Comments
			Auto	Transit	Pedestrian	Bicycle		
Tier 1: Traveled Way Strategy Checklist	1.01	**Road Diets:** A solution that can be applied to streets that are wider than necessary given the volume of traffic they carry during peak hours. A road diet reduces the number of travel lanes on a roadway, typically to one lane of traffic in each direction, in exchange for expanded sidewalks, bicycle lanes, on-street parking or landscaping.		✓	✓	✓	0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	1.02	**Medians:** Raised separators in the center of the roadway with widths between 6-20 feet or more. Medians add prominence to a segment of road, can be used to add landscaping, and are often a safe haven for crossing pedestrians and bicyclists on multi-lane roadways.	✓	✓	✓	✓	0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	1.03	**Paving Treatment:** One way to reduce speeds, or indicate special zones like bicycle lanes, bus stops or speed tables is to use a special paving treatment on the roadway surface. Some examples are colored or textured concrete, or stamped patterns.	✓	✓	✓	✓	0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	1.04	**Bicycle Facilities:** Bicycle accommodations on the street to reduce conflicts and create a more comfortable traffic environment for everyone. Examples: Bicycle lane, shared roadway.	✓	✓	✓	✓	0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	1.05	**Bicycle Lanes:** Lines and symbols on the roadway surface to delineate space for the exclusive use of bicyclists.	✓	✓	✓	✓	0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	

Chapter 8
Monitoring and Strategy Effectiveness

Chapter 8
Monitoring and Strategy Effectiveness

Introduction

The FHWA guidelines call for CMPs to include provisions to monitor the performance of strategies implemented to address congestion. Regulations require "a process for periodic assessment of the efficiency and effectiveness of implemented strategies, in terms of the area's established performance measures." This step of the process helps determine whether operational or policy adjustments are needed to make the current strategies work better and provides information about how various strategies work in order to implement future approaches within the CMP study area.

Data collection and performance monitoring are ongoing with the various periodic assessments of roadway, transit, bicycle/pedestrian/trail, freight network performance in Hernando and Citrus Counties. However, this CMP also identifies the need for a process that supports an annual tracking of the effectiveness of the implemented congestion mitigation strategies and the multimodal transportation system as a whole. This annual process is described in detail below.

Annual State of the System Report

As a key tool in the Hernando/Citrus MPO CMP, an Annual State of the System Report will be developed in the interim years until the next CMP update. This report will track the effectiveness of the implemented strategies, to the extent possible with the available project level data, and conditions of the multimodal transportation system as a whole. The same set of quantifiable performance measures established for the Hernando/Citrus MPO CMP as described in Chapter 6 of this report will be used to measure system performance at corridor and system levels. The measures that will be used in the Annual State of the System Report on Hernando/Citrus MPO CMP include:

- **Roadway Performance Measures**, including roadway traffic volume to capacity and crashes.
- **Public Transit Performance Measures**, including passenger trips per revenue hour, average peak service frequency, on-time performance, and annual ridership
- **Bicycle/Pedestrian/Trail Facility Performance Measures**, including percent of congested CMP roadway centerline miles with bicycle facilities, percent of congested CMP roadway centerline miles with sidewalk facilities, and miles of multi-use trails
- **TDM Performance Measures**, including the number of registered carpools or vanpools in the CMP study area
- **Goods Movement Performance Measures**, including the total truck vehicle miles traveled (VMT) in the study area

The commitment and schedule for preparing an Annual State of the System Report will be determined by the Hernando/Citrus MPO TAC/TSOC.

Typically the Annual State of the System Report will be completed by the MPO during the years between LRTP updates and the report is contingent on available funding. In the future the Annual State of the System Report is anticipated to support the requirement of the Transportation Improvement Program (TIP) to the maximum extent practicable, provide a description of the anticipated effect of the TIP toward achieving the performance targets established in the Plan, and how the TIP links investment priorities to those performance targets.

Appendix A Congested Corridors and Hot Spots

Appendix A

Congested Corridors and Hot Spots

Various criteria that primarily use traffic volume and capacity are used to select and categorize the congested corridors in Hernando and Citrus Counties. The methodology using these criteria to select congested corridors within the CMP application area is presented below. Thereafter, criteria used to identify congestion hot spots, i.e. intersections with recurring or non-recurring congestion, are also summarized.

Selection Methodology

This methodology summarizes the steps used to identify the congested roadways for the Hernando/Citrus MPO CMP. As indicated earlier, the CMP road network includes all existing and committed roadway segments as identified by the 2035 LRTP.

The selection methodology consists of two main steps. First, five criteria are used to categorize the roadways into three sub-categories. The sub-categories and corresponding criteria are presented below.

Not Congested (currently or in five years without improvements) - The corridors in this category are selected based on applying the following criteria at road segment level:

$$\text{Not Congested Corridors} = \text{Existing or Existing + 5 Years Segments with } \left(\frac{\text{Segment}^{i} \text{ volume}}{\text{Segment}^{i} \text{ maximum service volume}} \right) < \text{Segment}^{i} \text{ maximum service volume x 0.90}$$

$$(i = 1, 2, 3, \ldots n)$$

Approaching Congestion or Minimally Congested – The corridors that are approaching congestion are analyzed at three levels. The criteria in each level of analysis are summarized below.

- **Approaching Congestion**: This includes corridors with segments that meet the following criteria, which are currently congested or congested in five years without improvements.

$$\text{Corridors Approaching Congestions} = \text{Existing or Existing + 5 Years Segments with } 1.00 > \left(\frac{\text{Segment}^{i} \text{ volume}}{\text{Segment}^{i} \text{ maximum service volume}} \right) > 0.90$$

$$(i = 1, 2, 3, \ldots n)$$

- **Congested Today**: As summarized below, this category uses two criteria to identify the corridors that are congested today.

$$\text{Corridors Congested Today} = \text{Existing Segments with } 1.08 > \left(\frac{\text{Segment}^i \text{ volume}}{\text{Segment}^i \text{ capacty}}\right) \& \left(\frac{\text{Segment}^i \text{ volume}}{\text{Segment}^i \text{ maximum service volume}}\right) > 1.00$$

$$(i = 1, 2, 3, \ldots n)$$

- **Extremely Congested**: This category includes roadways in the 2014 E+C network that meets the following criteria are considered severely congested.

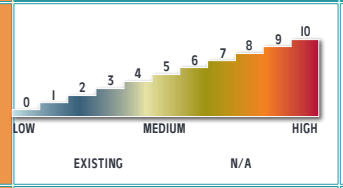
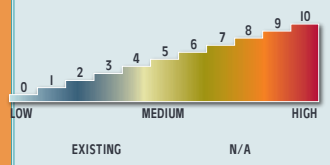
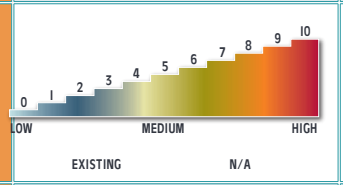
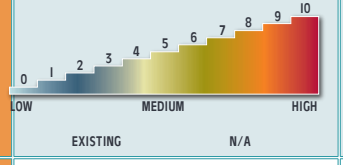
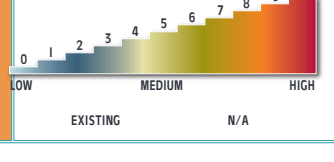
$$\text{Extremely Congested Corridors} = \text{Existing or Existing + 5 Years Segments with } \left(\frac{\text{Segment}^i \text{ volume}}{\text{Segment}^i \text{ capacty}}\right) > 1.08$$

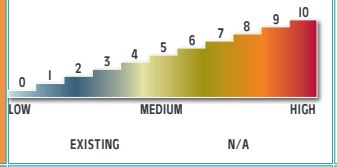
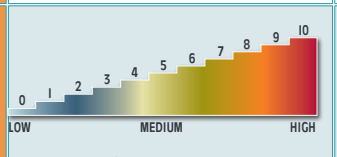
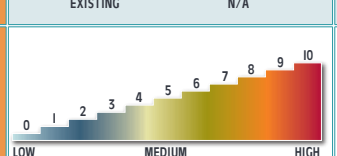
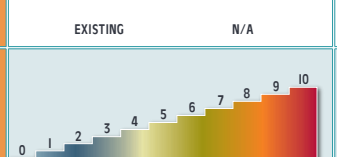
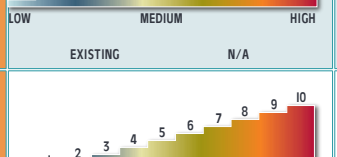
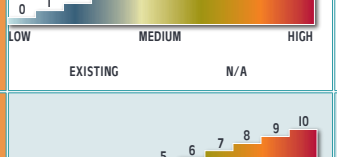
$$(i = 1, 2, 3, \ldots n)$$

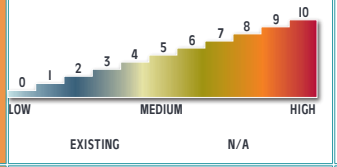
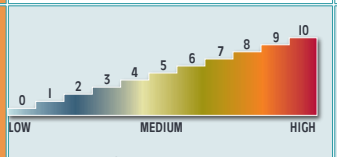
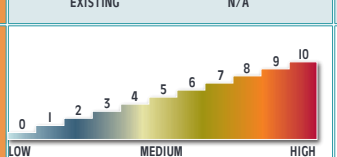
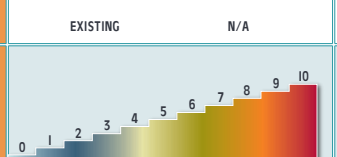
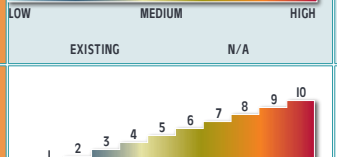
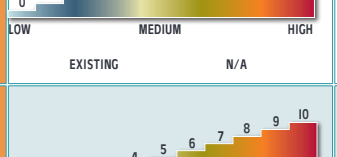
In addition to the congested roadways selected using the criteria presented above, high crash locations identified in crash data analysis reports and Mobility Management Systems Task Force recommendations of congested intersections are used to identify the congestion "Hot Spots."

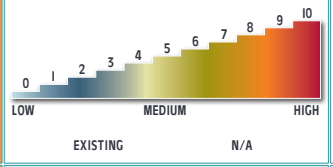
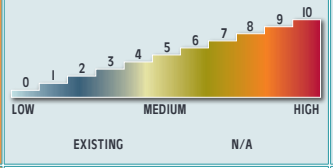
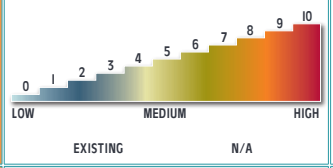
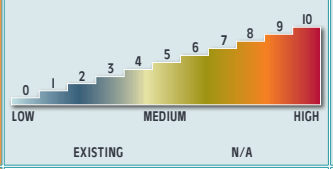
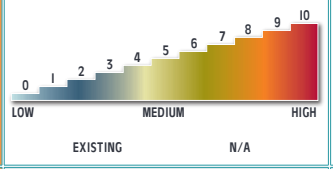
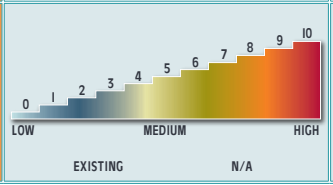
Appendix B
Congestion Mitigation Strategies Matrix

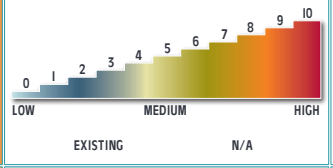
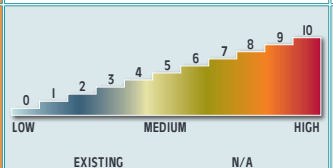
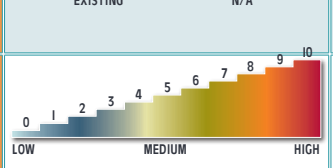
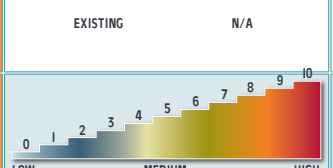
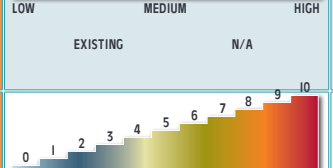
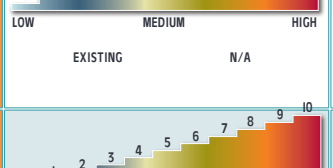
Corridor _____ From _____ To _____ Analyst _____ Date _____

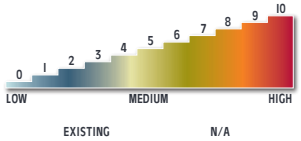
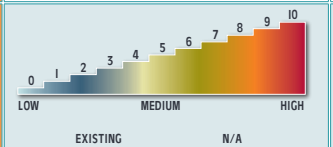
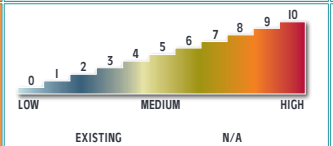
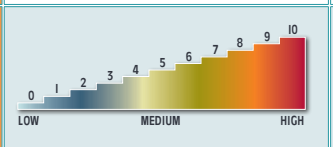
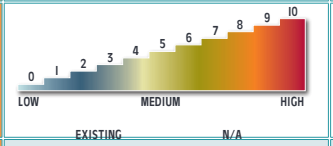
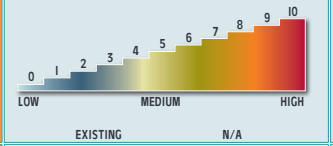
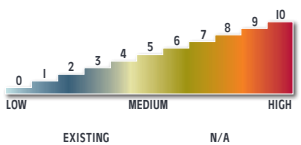
Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types				Potential Effectiveness	Recommendations/ Comments
			Regional Traffic	Regional Access	Local Access	Local Circulation		
Tier 1: Strategies to Reduce Person Trips or Vehicle Miles Traveled	LT	**1.01 Congestion Pricing:** Congestion pricing can be implemented statically or dynamically. Static congestion pricing requires that tolls are higher during traditional peak periods. Dynamic congestion pricing allows toll rates to vary depending upon actual traffic conditions. The more congested the road, the higher the cost to travel on the road. Dynamic congestion pricing works best when coupled with real-time information on the availability of other routes.						
	ST/LT	**1.02 Alternative Work Hours:** There are three main variations: staggered hours, flex-time, and compressed work weeks. Staggered hours require employees in different work groups to start at different times to spread out their arrival/departure times. Flex-time allows employees to arrive and leave outside of the traditional commute period. Compressed work weeks involve reducing the number of days per week worked while increasing the number of hours worked per day.						
	ST/LT	**1.03 Telecommuting:** Telecommuting policies allow employees to work at home or a regional telecommute center instead of going into the office, all the time or only one or more days per week.						
	ST/LT	**1.04 Emergency Ride Home Programs:** These programs provide a safety net to those people who carpool or use transit to work so that they can get to their destination if unexpected work demands or an emergency arises.						
	ST/LT	**1.05 Alternative Mode Marketing and Education:** Providing education on alternative modes of transportation can be an effective way of increasing demand for alternative modes. This strategy can include mapping websites that compute directions and travel times for multiple modes of travel.						

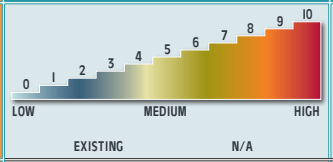
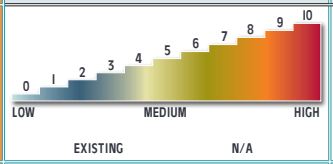
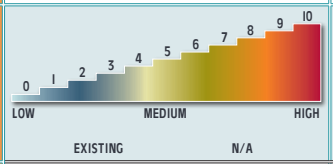
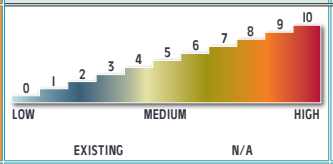
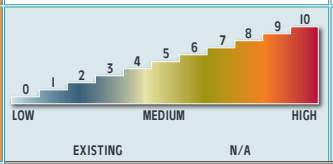
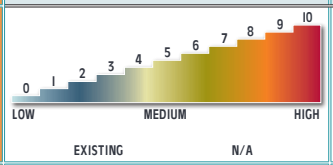
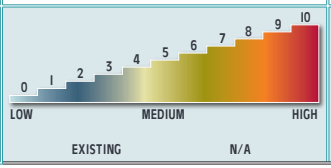
Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types								Potential Effectiveness	Recommendations/ Comments
			Regional Traffic		Regional Access		Local Access		Local Circulation			
Tier 1: Strategies to Reduce Person Trips or Vehicle Miles Traveled	ST/LT	**1.06 Safe Routes to Schools Program:** This program provides funding to communities to invest in pedestrian and bicycle infrastructure surrounding schools.										
	ST/LT	**1.07 Preferential for Free Parking for HOVs:** This program provides an incentive for employees to carpool with preferred of free-of-charge parking for HOVs.										
	ST/LT	**1.08 Negotiated Demand Management Agreements:** As a condition of development approval, local governments require the private sector to contribute to traffic mitigation agreements. The agreements typically set a traffic reduction goal (often expressed as a minimum level of ridesharing participation or a stipulated reduction in the number of automobile trips).										
	ST/LT	**1.09 Trip Reduction Ordinance:** These ordinances use a locality's regulatory authority to limit trip generation from a development. They spread the burden of reducing trip generation among existing and future developments better than Negotiated Demand Management Agreements.										
	ST	**1.10 Infill developments:** This strategy takes advantage of infrastructure that already exists, rather than building new infrastructure on the fringes of the urban area.										
	ST/LT	**1.11 Design Guidelines for Pedestrian-Oriented Development:** Maximum block lengths, building setback restrictions, and streetscape enhancements are examples of design guidelines that can be codified in zoning ordinances to encourage pedestrian activity.										

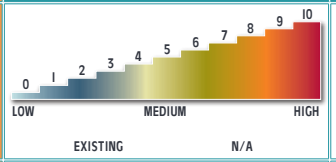
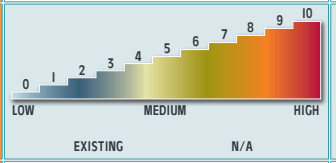
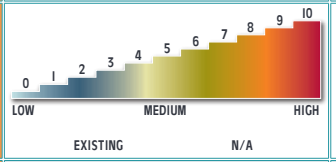
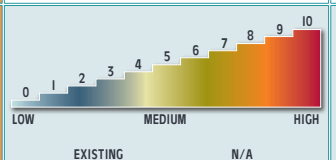
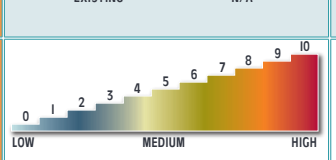
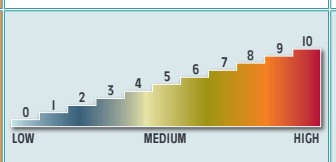
Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types								Potential Effectiveness	Recommendations/ Comments
			Regional Traffic		Regional Access		Local Access		Local Circulation			
Tier One	ST/LT	**1.12 Mixed-Use Development:** This strategy allows many trips to be made without automobiles. People can walk to restaurants and services rather than use their vehicles.										
Tier 2: Strategies to Shift Automobile Trips to Other Modes	ST/LT	**2.01 Transit Capacity Expansion:** This strategy adds new vehicles to expand transit services.										
	ST/LT	**2.02 Increasing Bus Route Coverage or Frequencies:** This strategy provides better accessibility to transit to a greater share of the population. Increasing frequency makes transit more attractive to use.										
	LT	**2.03 Implementing Regional Premium Transit:** Premium transit such as Bus Rapid Transit (BRT) best serves dense urban centers where travelers can walk to their destinations. Premium transit from suburban areas can sometimes be enhanced by providing park-and-ride lots.										
	ST/LT	**2.04 Providing Real-Time Information on Transit Routes:** Providing real-time information on bus progress either at bus stops, terminals, and/or personal wireless devices makes bus travel more attractive.										
	ST	**2.05 Reducing Transit Fares:** This relatively easy-to-implement strategy encourages additional transit use, to the extent that high fares are a real barrier to transit. However, due to the direct financial impact on the transit system operating budgets, reductions in selected fare categories may be a more feasible strategy to implement.										

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types				Potential Effectiveness	Recommendations/ Comments
			Regional Traffic	Regional Access	Local Access	Local Circulation		
Tier 2: Strategies to Shift Automobile Trips to Other Modes	LT	**2.06 Provide Exclusive Bus Right-Of-Way:** Exclusive right-of-way includes bus ways, bus-only lanes, and bus bypass ramps. This strategy is applied to freeways and major highways that have routes with high ridership.						
	ST/LT	**2.07 New Sidewalk Connections:** Increasing sidewalk connectivity encourages pedestrian traffic for short trips.						
	ST/LT	**2.08 Designated Bicycle Lanes on Facilities or Routes:** Enhancing the visibility of bicycle facilities increases the perception of safety. In many cases, bicycle lanes can be added to existing roadways through restriping.						
	ST	**2.09 Improved Bicycle Facilities at Transit Stations and Other Trip Destinations:** Bicycle racks and bicycle lockers at transit stations and other trip destinations increase security. Additional amenities such as locker rooms with showers at workplaces provide further incentives for using bicycles.						
	ST	**2.10 Improved Safety of Existing Bicycle and Pedestrian Facilities:** Maintaining lighting, signage, striping, traffic control devices, and pavement quality and installing curb cuts, curb extensions, median refuges, and raised crosswalks can increase bicycle and pedestrian safety.						
	LT	**2.11 Exclusive Non-Motorized ROW:** Abandoned rail rights-of-way and existing parkland can be used for medium- to long-distance bicycle trails, improving safety and reducing travel times.						

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types				Potential Effectiveness	Recommendations/ Comments
			Regional Traffic	Regional Access	Local Access	Local Circulation		
Tier 2	ST/LT	**2.12 Intermodal Enhancements:** Coordinating modes makes movement from one mode to the other easier. These enhancements typically includes schedule modification to reduce layover time or increase the opportunity for transfers, creation of multi-modal facilities, informational kiosks, and improved amenities at transfer locations.						
Tier 3: Strategies to Increase Vehicle Occupancy	LT	**3.01 Ridesharing (Carpools, Vanpools, Lyft, Uber):** In ridesharing programs, participants are matched with potential candidates for sharing rides. This is typically arranged/encouraged through employers or transportation management agencies, which provide ride-matching services. These programs are more effective if combined with HOV lanes, parking management, guaranteed ride home policies, and employer-based incentive programs.						
	ST/LT	**3.02 High Occupancy Vehicle Lanes:** This increases corridor capacity while at the same time providing an incentive for single-occupant drivers to shift to ridesharing. These lanes are most effective as part of a comprehensive effort to encourage HOVs, including publicity, outreach, park-and-ride lots, rideshare matching services, and employer incentives.						
	ST/LT	**3.03 Park-and-Ride Lots (Kiss N Ride):** These lots can be used in conjunction with HOV lanes and/or express bus services. They are particularly helpful when coupled with other commute alternatives such as carpool/ vanpool programs, transit, and/or HOV lanes.						
	ST/LT	**3.04 Employer-Landlord Parking Agreements:** Employers can negotiate leases so that they pay only for parking spaces used by employees. In turn, employers can pass along parking savings by purchasing transit passes or reimbursing non-driving employees with the cash equivalent of a parking space.						
	ST/LT	**3.05 Parking Management:** This strategy reduces the instance of free parking to encourage other modes of transportation. Options include reducing the minimum number of parking spaces required per development, increasing the share of parking spaces for HOVs, introducing or raising parking fees, providing cash-out options for employees not using subsidized parking spaces, and expanding parking at transit stations or park-and-ride lots.						

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types								Potential Effectiveness	Recommendations/ Comments
			Regional Traffic		Regional Access		Local Access		Local Circulation			
Tier 3	LT	**3.06 Managed Lanes:** The Federal Highway Administration (FHWA) defines managed lanes as highway facilities or a set of lanes in which operational strategies are implemented and managed (in real time) in response to changing conditions. Examples of managed lanes may include the following: high-occupancy toll (HOT) lanes with tolls that vary based on demand; exclusive bus-only lanes; HOV and clean air and/or energy-efficient vehicle lanes; and HOV lanes that could be changed into HOT lanes in response to changing levels of traffic and roadway conditions.										
Tier 4: Strategies to Improve Roadway Operations	ST/LT	**4.01 Dynamic Messaging:** Dynamic messaging uses changeable message signs to warn motorists of downstream queues; it provides travel time estimates, alternate route information, and information on special events, weather, or accidents.										
	ST/LT	**4.02 Advanced Traveler Information Systems (ATIS):** ATIS provide an extensive amount of data to travelers, such as real-time speed estimates on the web or over wireless devices and transit vehicle schedule progress. It also provides information on alternative route options.										
	ST/LT	**4.03 Integrated Corridor Management (ICM):** This strategy, built on an ITS platform, provides for the coordination of the individual network operations between parallel facilities creating an interconnected system. A coordinated effort between networks along a corridor can effectively manage the total capacity in a way that will result in reduced congestion.										
	ST	**4.04 Transit Signal Priority (TSP):** This strategy uses technology located onboard transit vehicles or at signalized intersections to temporarily extend green time, allowing the transit vehicle to proceed without stopping at a red light.										
	ST	**4.05 Truck Signal Priority:** This strategy gives priority to a traffic signal approach when trucks are detected. This can reduce truck travel times and potentially increases safety by reducing the number of trucks arriving at the end of the green phase, which may reduce red light running.										
	ST	**4.06 Traffic Signal Coordination:** Signals can be pre-timed and isolated, pre-timed and synchronized, actuated by events (such as the arrival of a vehicle, pedestrian, bus or emergency vehicle), set to adopt one of several pre-defined phasing plans based on current traffic conditions, or set to calculate an optimal phasing plan based on current conditions.										

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types				Potential Effectiveness	Recommendations/ Comments
			Regional Traffic	Regional Access	Local Access	Local Circulation		
Tier 4: Strategies to Improve Roadway Operations	ST/LT	**4.07 Channelization:** This strategy is used to optimize the flow of traffic for making left or right turns usually using concrete islands or pavement markings.						
	ST/LT	**4.08 Intersection Improvements:** Intersections can be widened and lanes restriped to increase intersection capacity and safety. This may include auxiliary turn lanes (right or left) and widened shoulders.						
	ST/LT	**4.09 Bottleneck Removal:** This strategy removes or corrects short, isolated, and temporary lane reductions, substandard design elements, and other physical limitations that form a capacity constraint that results in a traffic bottleneck.						
	LT	**4.10 Vehicle Use Limitations and Restrictions:** This strategy includes all-day or selected time-of-day restrictions of vehicles, typically trucks, to increase roadway capacity.						
	ST	**4.11 Improved Signage:** Improving or removing signage to clearly communicate location and direction information can improve traffic flow.						
	ST/LT	**4.12 Geometric Improvements for Transit:** This strategy includes providing for transit stop locations that do not affect the flow of traffic, improve sight lines, and improve merging and diverging of buses and cars.						
	ST/LT	**4.13 Goods Movement Management:** This strategy restricts delivery or pickup of goods in certain areas to reduce congestion.						

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Distribution of Trip Types								Potential Effectiveness	Recommendations/ Comments
			Regional Traffic		Regional Access		Local Access		Local Circulation			
Tier 4: Strategies to Improve Roadway Operations	ST/LT	**4.14 Freeway Incident Detection and Management Systems:** This strategy addresses primarily non-recurring congestion, typically includes video monitoring and dispatch systems, and may also include roving service patrol vehicles.										
	ST/LT	**4.15 Access Management Policies:** This strategy includes adoption of policies to regulate driveways and limit curb cuts and/or policies that require continuity of sidewalk, bicycle, and trail networks.										
	ST/LT	**4.16 Corridor Preservation:** This strategy includes implementing, where applicable, land acquisition techniques such as full title purchases of future rights-of-way and purchase of easements to plan proactively in anticipation of future roadway capacity demands.										
	ST/LT	**4.17 Corridor Management:** This strategy is applicable primarily in moderate- to high-density areas and includes strategies to manage corridor rights-of-way. The strategies range from land-use regulations to landowner agreements such as subdivision reservations, which are mandatory dedications of portions of subdivided lots that lie in the future right-of-way.										
	ST/LT	**4.18 Complete Streets:** Routinely design and operate the entire right of way to enable safe access for all users including pedestrians, bicyclists, motorists, and transit Element that may be found on a complete street include sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible transit stops, frequent crossing opportunities, median islands, accessible pedestrian signals, curb extensions, and more.										
Tier 5: Strategies to Add Capacity	LT	**5.01 Add General Purpose Travel Lanes:** Increase the capacity of congested roadways through additional general purpose travel lanes.										

METROPOLITAN PLANNING ORGANIZATION
HERNANDO / CITRUS

Congestion Management Process

POLICY AND PROCEDURES HANDBOOK

Appendix C
Safety Mitigation Matrix

Key Safety Emphasis Areas for CMP Integration		
Community Traffic Safety Program	**Comprehensive Traffic Enforcement and Education Program**	**Motorcycle Safety Program**
Community Traffic Safety teams are multidisciplinary efforts (engineering, law enforcement, education, etc.) who work together to target community specific traffic safety issues.	The Comprehensive Traffic Enforcement and Education Program involves the aggressive enforcement of traffic laws in the following priority areas: Distracted Driving, Impaired Driving, Motorcycle Safety, Occupant Protection and Child Passenger Safety, Pedestrian and Bicycle Safety, Speed/Aggressive Driving, and Teen Driving. Comprehensive projects are funded in communities with a significant number of serious injuries and fatalities that are linked to priority traffic safety areas. Focusing on enhanced enforcement and educational efforts that support critical traffic laws, these efforts will reduce crashes and save lives. Goals of the program are to increase awareness, education, and enforcement of key traffic safety laws that will contribute to a minimum 5 percent annual reduction in fatalities.	This program area addresses crashes involving motorcyclists which is a significant cause of traffic fatalities in Florida.
Potential Strategies	**Potential Strategies**	**Potential Strategies**
■ Increase public awareness and highway traffic safety programs ■ Expand the network of concerned individuals to build recognition and awareness about traffic safety ■ Support initiatives that enhance traffic laws and regulations related to safe driving	■ Increase public awareness of highway traffic safety programs ■ Expand the network of concerned stakeholders to build recognition and awareness of traffic safety ■ Support initiatives that enhance traffic safety laws and regulations related to safe driving ■ Support and promote effective law enforcement efforts related to safe driving	■ Collect and analyze data on motorcycle crashes, injuries, and fatalities to provide local and state agencies with the best available data to make appropriate and timely decisions that improve motorcycle safety in Florida ■ Manage motorcycle safety activities in Florida as part of a comprehensive plan that includes centralized program planning, implementation, coordination, and evaluation to maximize the effectiveness of programs and reduce duplication of effort ■ Promote personal protective gear and its value in reducing motorcyclist injury levels and increasing rider conspicuity ■ Ensure persons operating a motorcycle on public roadways hold an endorsement specifically authorizing motorcycle operation ■ Promote adequate rider training and preparation to new and experienced motorcycle riders by qualified instructors at State-approved training centers ■ Reduce the number of alcohol, drug, and speed-related motorcycle crashes in Florida ■ Support legislative initiatives that promote motorcycle safety-related traffic laws and regulations ■ Ensure State and local motorcycle safety programs include law enforcement and emergency services components ■ Incorporate motorcycle-friendly policies and practices into roadway design, traffic control, construction, operation, and maintenance ■ Increase the visibility of motorcyclists by emphasizing rider conspicuity and motorist awareness of motorcycles ■ Develop and implement communications strategies that target high-risk populations and improve public awareness of motorcycle crash problems and programs

Key Safety Emphasis Areas for CMP Integration (continued)

Pedestrian and Bicycle Safety Program	Public Traffic Safety Professionals Training	Speed/Aggressive Driving Program
This program area addresses bicycle and pedestrian crashes which represent a disproportionate share of fatal crashes.	This program area seeks to improve the ability of law enforcement to implement effective traffic enforcement and accident investigation techniques.	Aggressive driving, as defined by State Statute, requires inclusion of at least two of the following contributing causes: speeding, unsafe or improper lane change, following too closely, failure to yield right-of-way, improper passing, and failure to obey traffic control devices.
Potential Strategies	**Potential Strategies**	**Potential Strategies**
■ Increase awareness and understanding of safety issues related to vulnerable road users ■ Increase compliance with traffic laws and regulations related to pedestrian and bicycle safety through education and enforcement ■ Develop and use a systemic approach to identify locations and behaviors prone to pedestrian and bicycle crashes and implement multidisciplinary countermeasures ■ Promote, plan, and implement built environments (urban, suburban, and rural) which encourage safe bicycling and walking ■ Support national, state, and local legislative initiatives and policies that promote bicycle and pedestrian safety	■ Increase traffic safety professionals' awareness of highway safety issues ■ Improve traffic enforcement and detection skills ■ Improve crash investigation and prosecution skills ■ Improve detection, prosecution, and adjudication of impaired driving cases ■ Increase understanding of the importance of accurate data collection and analysis	■ Support and promote effective law enforcement efforts to reduce aggressive driving ■ Support and promote effective law enforcement efforts to reduce speed-related crashes ■ Increase training and education on the problems of speed/aggressive driving ■ Identify and support initiatives that reduce instances of speeding and aggressive driving

Other Safety Emphasis Areas for CMP Integration

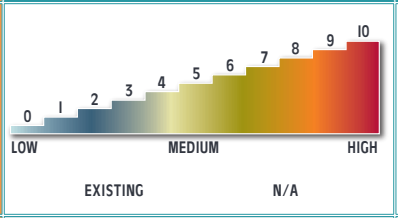
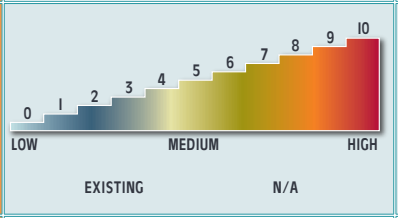
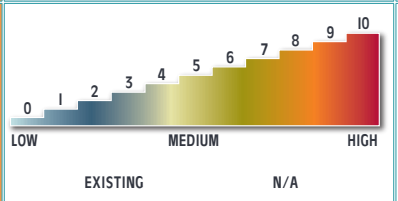
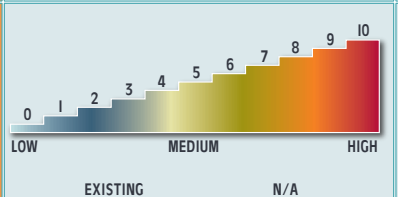
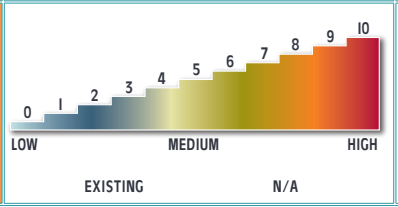
Aging Road Users Program	Distracted Driving Program	Impaired Driving Program	Occupant Protection and Child Passenger Safety Program
At-risk aging road users addresses all modes of transportation. For data purposes in this emphasis area, aging road users are defined as 65-year-olds and older.	Distracted driving occurs when a driver allows any mental or physical activity to take the driver's focus off the task of driving. There are three main types of distraction: manual – taking your hands off the wheel; visual – taking your eyes off the road; and cognitive – taking your mind off driving.	Originally focused on alcohol impaired driving only, the state has expanded the focus to include drug impaired driving due to its prevalence and close association to alcohol impairment.	The goal of Florida's Occupant Protection and Child Passenger Safety Program is to improve the use of age-appropriate safety restraints to reduce traffic fatalities and serious injuries.
Potential Strategies	**Potential Strategies**	**Potential Strategies**	**Potential Strategies**
■ Manage and evaluate aging road user safety, access, and mobility activities to maximize the effectiveness of programs and resources ■ Provide the best available data to assist with decisions that improve aging road user safety, access, and mobility ■ Provide information and resources regarding aging road user safety, access, and mobility ■ Inform public officials about the importance and need to support national, State, regional, and local policy and program initiatives which promote and sustain aging road user safety, access, and mobility ■ Promote and encourage practices that support and enhance aging in place (i.e., improve the environment to better accommodate the safety, access, and mobility of aging road users) ■ Enhance aging road user safety and mobility through assessment, remediation, and rehabilitation ■ Promote safe driving and mobility for aging road users through licensing and enforcement ■ Promote the safe mobility of aging vulnerable road users (pedestrians, transit riders, bicyclists, and other non-motorized vehicles) ■ Promote the value of prevention strategies and early recognition of at-risk drivers to aging road users and stakeholders ■ Bridge the gap between driving retirement and mobility independence (i.e., alternative transportation mobility options, public transportation, and dementia-friendly transportation)	■ Increase public awareness and outreach programs on distracted driving ■ Encourage companies, state agencies, and local governments to adopt and enforce policies to reduce distracted driving in company and government vehicles ■ Support legislative initiatives that enhance distracted driving-related traffic laws and regulations ■ Support Graduated Driver's License (GDL) restrictions to reduce distracted driving behaviors in teen drivers ■ Increase law enforcement officer understanding of Florida traffic crash reporting and distracted driving data collection ■ Educate law enforcement, judges, and magistrates on the existing laws that can be applied to distracted driving ■ Deploy high-visibility enforcement mobilizations on distracted driving subject to appropriate/future legislation	■ Improve DUI enforcement ■ Improve prosecution and adjudication of impaired driving cases ■ Improve the DUI administrative suspension process ■ Improve prevention, public education, and training ■ Improve the treatment system (i.e., DUI programs, treatment providers, and health care providers) ■ Improve data collection and analysis	■ Support the Occupant Protection Resource Center which provides stakeholders with occupant protection public information and education materials, information regarding child passenger safety inspection stations, and child passenger safety technician and instructor training ■ Promote safety belt and child restraint use to high-risk groups through the Florida Occupant Protection Task Force ■ Support the national Click It or Ticket mobilization through overtime enforcement efforts targeting safety belt and child restraint use during day and nighttime hours

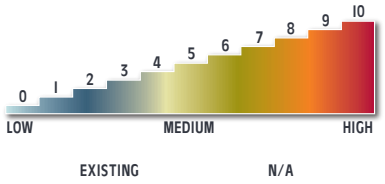
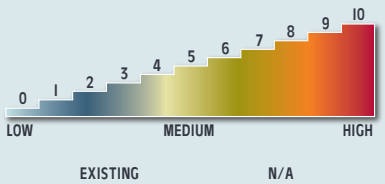
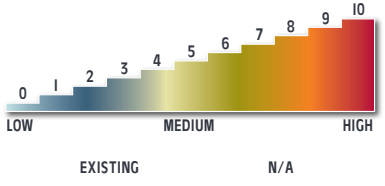
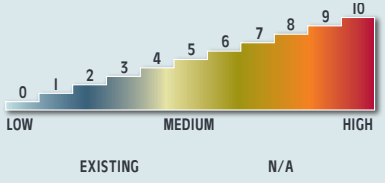
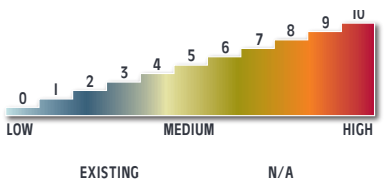
Other Safety Emphasis Areas for CMP Integration (continued)

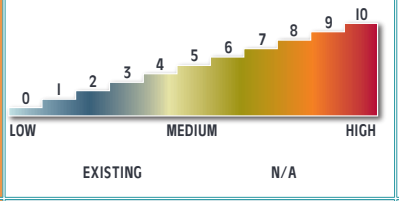
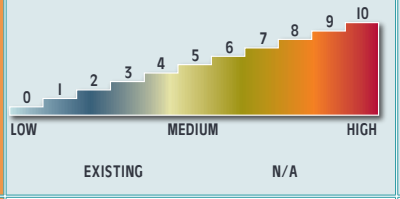
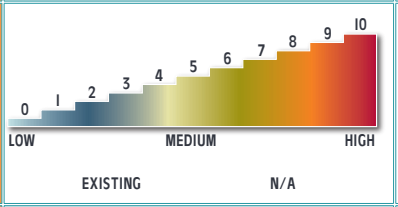
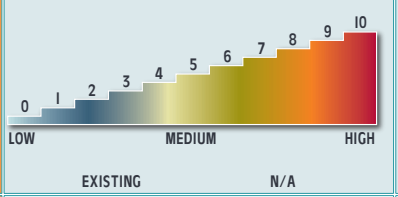
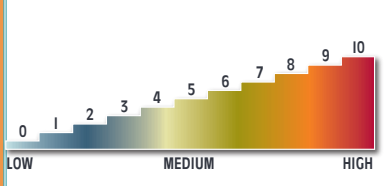
Paid Media Program	Teen Driver Safety Program	Traffic Records Program
Florida's paid media plan is designed to heighten traffic safety awareness and support enforcement efforts by aggressively marketing State and national traffic safety campaigns. Each media purchase is program-specific and location and medium are selected based on the number of expected impressions, geographic location of high risk, statewide exposure benefits, available funding, and in-kind match. This focused approach to media supports education and enforcement activities around the State.	At-risk drivers, comprised of teen drivers who represent a disproportionate number of traffic crashes. For data purposes in this emphasis area, teen drivers are 15- to 19-year-olds.	This addresses Federal requirements and funding for traffic records. This emphasis area was meant to ensure traffic records aligned with the overall SHSP where possible and appropriate.
Potential Strategies	**Potential Strategies**	**Potential Strategies**
■ Increase public awareness of highway traffic safety programs and enforcement ■ Expand the network of concerned individuals to build recognition and awareness	■ Expand the network of concerned individuals to build recognition and awareness as it relates to teen driver safety and support for the Florida Teen Safe Driving Coalition ■ Create a safe driving culture for teen drivers through outreach and education ■ Support initiatives that enhance safe teen driving-related traffic laws and regulations related to safe teen driving	■ Develop and maintain complete, accurate, uniform, and timely traffic records data ■ Provide the ability to link traffic records data together ■ Facilitate access to traffic records data ■ Promote the use of traffic records data

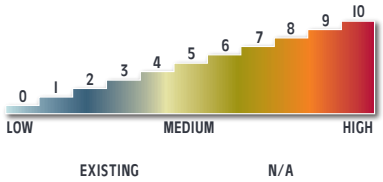
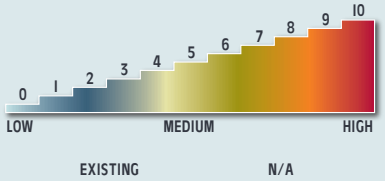
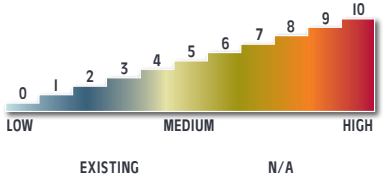
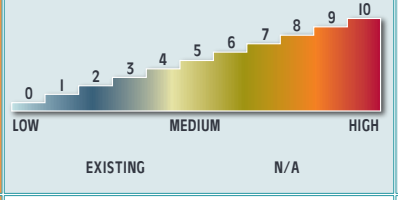
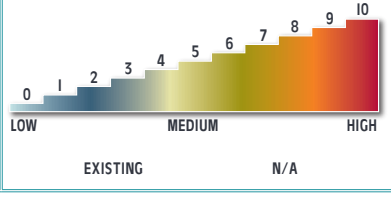
Appendix D
Complete Streets Strategy Matrix

Corridor _____ From _____ To _____ Analyst _____ Date _____

Tier	Strategy #	Strategy	Modal Benefit				Potential Effectiveness	Recommendations/Comments
			Auto	Transit	Pedestrian	Bicycle		
Tier 1: Traveled Way Strategy Checklist	1.01	**Road Diets:** A solution that can be applied to streets that are wider than necessary given the volume of traffic they carry during peak hours. A road diet reduces the number of travel lanes on a roadway, typically to one lane of traffic in each direction, in exchange for expanded sidewalks, bicycle lanes, on-street parking or landscaping.		✓	✓	✓		
	1.02	**Medians:** Raised separators in the center of the roadway with widths between 6-20 feet or more. Medians add prominence to a segment of road, can be used to add landscaping, and are often a safe haven for crossing pedestrians and bicyclists on multi-lane roadways.	✓	✓	✓	✓		
	1.03	**Paving Treatment:** One way to reduce speeds, or indicate special zones like bicycle lanes, bus stops or speed tables is to use a special paving treatment on the roadway surface. Some examples are colored or textured concrete, or stamped patterns.	✓	✓	✓	✓		
	1.04	**Bicycle Facilities:** Bicycle accommodations on the street to reduce conflicts and create a more comfortable traffic environment for everyone. Examples: Bicycle lane, shared roadway.	✓	✓	✓	✓		
	1.05	**Bicycle Lanes:** Lines and symbols on the roadway surface to delineate space for the exclusive use of bicyclists.	✓	✓	✓	✓		

Tier	Strategy #	Strategy	Modal Benefit				Potential Effectiveness	Recommendations/Comments
			Auto	Transit	Pedestrian	Bicycle		
Tier 1: Traveled Way Strategy Checklist	1.06	**Bicycles at Signalized Intersections:** Special considerations are necessary to design traffic signals that serve both motorists and bicyclists because they require different operating characteristics. Signal progression should balance the needs of all users with appropriate design speeds and traffic signal coordination settings.						
	1.07	**Bicycle Boxes:** Dedicated space between the crosswalk and the motor vehicle stop line used to provide bicyclists a dedicated space to wait during a red light.						
	1.08	**Cycle Tracks:** Tracks reserved for the exclusive use of bicyclists and provide a physical separation between bicycles and vehicles. Tracks are often installed at a higher elevation than that the street, such as curb height.						
	1.09	**Transit Strategies:** Design strategies that improve transit operations and reduce delays for transit vehicles at intersections and present design guidance on the individual bus stops and sidewalk connections. Examples: signal coordination, signal priority for transit vehicles, with dedicated transit-only lanes, queue jump lanes						
	1.10	**Bus Stop Locations:** Safe, convenient, well-lit, clearly visible, and must be ADA-compliant. Proper spacing and siting of bus stops involves considerations, such as the bus route, population density, popular destinations, transfer locations, intersection operations and geometry, parking restrictions, and sightlines.						

Tier	Strategy #	Strategy	Modal Benefit				Potential Effectiveness	Recommendations/Comments
			Auto	Transit	Pedestrian	Bicycle		
Tier 1: Traveled Way Strategy Checklist	1.11	**Transit Prioritization at Intersections:** Bus service becomes more reliable and efficient when transit is prioritized at the intersections. Transit prioritization strategies include signal coordination, signal priority, transit-only lanes, and queue jump or bypass lanes.		✓				
	1.12	**Bus Bulbs:** Curb extensions along the length of a bus stop that eliminate the need for buses to pull in and out of traffic.		✓	✓	✓		
	1.13	**On-Street Parking:** Serves the parking needs of local businesses, and as a buffer between pedestrians and passing traffic. Pedestrians feel more comfortable and parked cars help calm traffic by visually narrowing and increasing friction along the edge of the roadway.	✓		✓			
	1.14	**Modern Roundabouts:** Circular intersections designed for lower speeds and yield-controlled entry. Pedestrian crossing is only allowed across the legs of the roundabout behind the yield lines.	✓	✓	✓	✓		
Tier 2: Intersection Strategy Checklist	2.01	**Curb Radii:** The corner radius has a significant impact on an intersections. Larger curb radii encourages turns at higher speeds, while smaller curb radii reduce speeds, shorten crossing distances for pedestrians, and improve sight distances. Burb Radii should balance the needs of both the design vehicles and mix of multimodal traffic.	✓	✓	✓	✓		

Tier	Strategy #	Strategy	Modal Benefit				Potential Effectiveness	Recommendations/Comments
			Auto	Transit	Pedestrian	Bicycle		
Tier 2: Intersection Strategy Checklist	2.02	**Curb Ramps:** Provides a smooth transition from the sidewalk to the street. Appropriately designed curb ramps are critical for providing access across intersections for people with mobility and visibility disabilities.		✓	✓	✓		
	2.03	**Curb Extensions:** Also known as neck-downs or bulb-outs, reduce the effective crossing width of the street by extending the curb line across a parking lane to the adjacent travel lanes. They have many pedestrian benefits including reducing crossing distances, and enhancing visibility between pedestrian and other roadway users.		✓	✓	✓		
	2.04	**Crosswalks Markings at Uncontrolled Locations:** Marked crosswalks are appropriate at uncontrolled locations (no traffic control devices to regulate the movement of traffic) as well as where safety enhancements are needed to increase driver and pedestrian visibility and awareness.	✓	✓	✓	✓		
	2.05	**Crossing Islands:** Medians that provide protected areas within a crosswalk so pedestrians only have to focus on and cross one direction of traffic at a time.	✓	✓	✓	✓		
	2.06	**Raised Crossings and Intersections:** A type of speed table with marked crosswalk on the flat plateau and the top of the table. They act as a traffic calming devices that help improve sightlines between pedestrians and motorist as well as increasing yield compliance.		✓	✓	✓		

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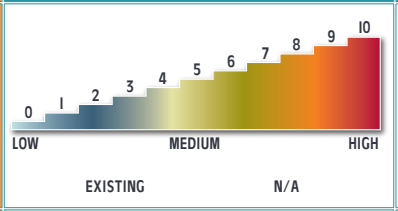
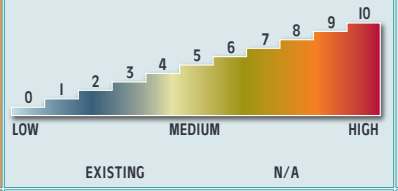
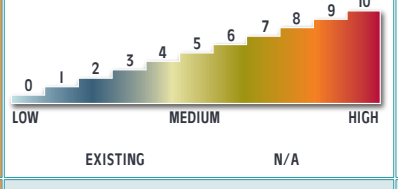
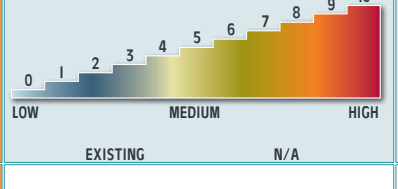
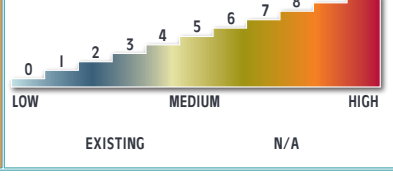
			Auto	Transit	Pedestrian	Bicycle		
Tier 2: Intersection Strategy Checklist	2.07	**Advance Yield Markings and Signs:** Markings and signs that improve motorist expectations that a pedestrian my be present on a multilane roadway. They are placed further back from the crosswalk and used in conjunction with "Yield to Pedestrian" signs.	✓	✓	✓	✓		
	2.08	**In-street Yield to Pedestrian Signs:** Signs placed in the roadway to alert drivers to the crossing and remind them to yield to pedestrians.	✓	✓	✓	✓		
	2.09	**Rectangular Rapid-Flash Pedestrian Beacons:** Beacons that are placed curbside below the pedestrian crossing sign and above the indication arrow that are activated by a pedestrian call button with causes an irregular LED flash pattern.	✓	✓	✓	✓		
	2.10	**Pedestrian Signal Heads:** A phased signal for pedestrian traffic, often including "Walk", "Don't Walk" and countdown displays. All marked crosswalks at all signalized intersections should have pedestrian signal heads.	✓	✓	✓	✓		
	2.11	**Accessible Pedestrian Signals (APS):** Devices that communicate the "Walk" and "Don't Walk" intervals at signalized intersections to people with visual and/or hearing disabilities.	✓	✓	✓			

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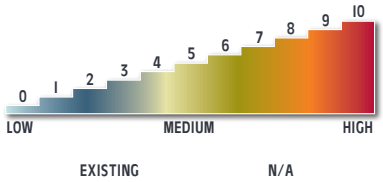
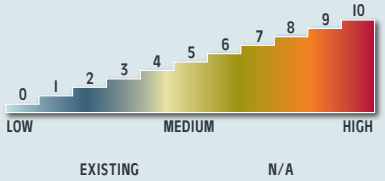
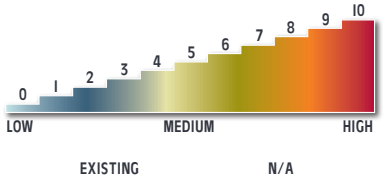
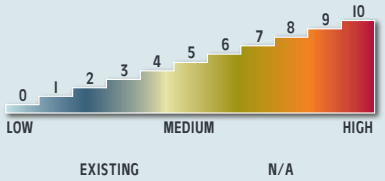
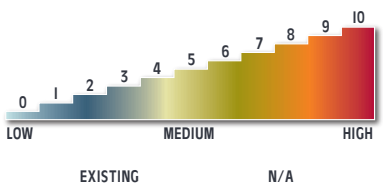
Tier 2: Intersection Strategy Checklist	2.12	**Exclusive Signal Phases for Pedestrians:** Concurrent pedestrian phase occurs when pedestrians have the "Walk" indicator. while parallel and turning traffic is permitted. Protected pedestrian phase occurs when pedestrians have the"Walk"" indicator while turning movements are prohibited by a signal or "No Turn on Red" sign. Exclusive pedestrian phase occurs when pedestrians have the "Walk" indicator which all other movements are prohibited by a signal or "No Turn on Red" sign.						
	2.13	**Signalization Strategies to Reduce Conflicts:** These strategies typically include separate movements and include: lagging protected left-turn phases, restricting turns on red, leading pedestrian intervals, exclusive and protected pedestrian signal phases.						
Tier 3: Streetside Strategy Checklist	3.01	**Seating:** Chairs, benches, seating walls, etc., that gives pedestrians a place to rest or wait for other modes inorder to make a multimodal trip.						
	3.02	**Bicycle Racks:** Bicycle parking is critical to encourage bicycling. Racks should be easy to use, simple in design, and support the frame at two points.						
	3.03	**Bicycle Shelters:** Secure, covered areas for bicycle parking often located a minimum of 50 feet from transit stations, building entrances, and other areas with high bicycle activity to encourage use.						

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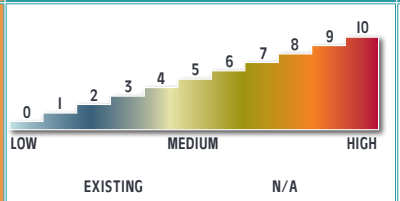
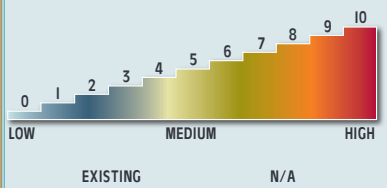
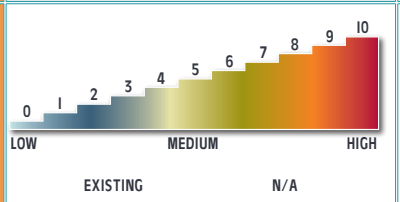
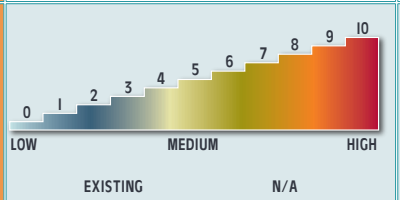
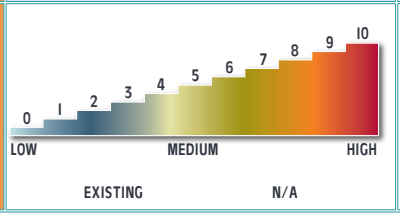
Tier 3: Streetside Strategy Checklist	3.04	**Bollards:** Permanent or temporary objects or pillars whose main functions are to protect pedestrians, bicyclists, buildings and other areas from vehicles and accentuate traffic calming. Large planters can also be used for this purpose.	✓	✓	✓	✓		
	3.05	**Recycling Bins and Garbage Cans:** Plentiful and convenient public receptacles for trash and recycling are important to keep streets and sidewalks clean.		✓	✓	✓		
	3.06	**Transit Nodes:** A collection of pedestrian services (bus shelters, crosswalks, RRFB, pedestrian sign) that have a greater visual impact benefitting drivers and pedestrians alike.		✓	✓	✓		
	3.07	**Bus Stops:** Comfortable, accessible, and safe bus stops improve the value of transit to the community. Amenities can include benches, trash receptacles, shelters, lighting, bicycle racks, bus schedules, maps, real time/next bus arrival information, newspaper boxes and public art.		✓	✓	✓		
	3.08	**Bus Shelters:** Comfortable, convenient bus shelters encourage transit use and should be provided on all key bus routes if sidewalk space allows. With the goal of benefitting the largest number of riders, bus shelters should be prioritized and installed based on ridership or economic development considerations.		✓	✓	✓		

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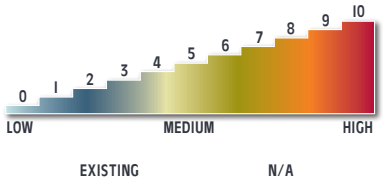
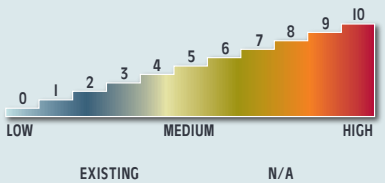
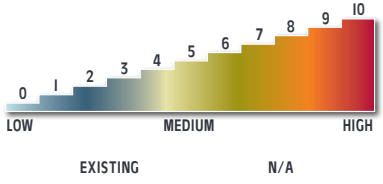
Tier 3: Streetside Strategy Checklist	3.09	**Driveways:** Driveway design has a considerable influence on pedestrian safety and comfort since driveways typically cross pedestrian zones and put pedestrians in direct conflict with vehicles.	✓		✓	✓		
	3.10	**Plazas, Pocket Parks, and Parklets:** Urban Open Spaces encourage pedestrian and bicycle activity and are important to civic life, by serving as public "living rooms" for municipal events.		✓	✓	✓		
	3.11	**Sidewalk Cafes:** Sidewalk cafes add interest, enliven public space and should be encouraged. They involve private use of public space and must be regulated to ensure fire codes compliance and pedestrian access. Clear pedestrian paths at least 5 feet wide on the sidewalks must be maintained.		✓	✓	✓		

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