MOBILITY 2040
Pasco County MPO
Transportation Plan

Technical Report No. 7

Congestion Management Process

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planning | design | engineering

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CONGESTION MANAGEMENT PROCESS

MOBILITY 2040

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Transportation Plan

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Section 1: Introduction

This report was prepared in support of the MOBILITY 2040 Long Range Transportation Plan (LRTP) to identify, evaluate, and address traffic operations and safety improvements to the transportation system through the use of strategies that reduce travel demand or implement operational improvements.

The Congestion Management Process (CMP) is a management system and process conducted by the Pasco Metropolitan Planning Organization (MPO), as required by the federal government, as part of its routine planning efforts. The public benefits from having a functional CMP in place because it often can improve travel conditions through the use of low-cost improvements or strategies that 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 10+ years to implement and cost significantly more. Projects identified through the CMP process also may be added to future updates of the LRTP should they require a longer timeframe to implement.

The CMP has evolved from what was previously known as the Mobility Management System (MMS) in Pasco County. The primary changes in the CMP, compared with the MMS, were to include the identification of revised Goals and Objectives and the development of a matrix of CMP-related strategies that typically would be considered when evaluating congested corridors. The Pasco County MPO implemented its first MMS in the mid-1990s. Key highlights of the Pasco County MMS include:

- Completion of a technical process undertaken 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 Mobility Management Task Force concurrent with the MPO's Technical Advisory Committee (TAC) meetings

Under federal guidelines, the CMP is described as an eight-step process, as summarized below:

1. **Develop Congestion Management Objectives** – Objectives should be identified that help to accomplish the congestion management goals.

2. **Identify Area of Application** – The CMP must cover a well-defined application area.

3. **Define System/Network of Interest** – The CMP must define the transportation network that will be evaluated.

4. **Develop Performance Measures** – The CMP must define the measures by which it will monitor and measure congestion.

5. **Institute System Performance Monitoring Plan** – There must be a regularly-scheduled performance monitoring plan for assessing the state of the transportation network and evaluating the status of congestion.

6. **Identify Congestion/Evaluate Strategies** – There must be a toolbox for selecting congestion mitigation strategies and evaluating potential benefits; congested locations are identified in this step.

7. **Implement Selected Strategies/Manage System** – There must be a plan for implementing the CMP as part of the regional transportation planning process.

8. **Monitor Strategy Effectiveness** – The strategies must be regularly monitored to gauge the effectiveness.

Each step of the Congestion Management Process is discussed in detail in the *CMP Procedures and Policies Handbook*, available on the Pasco County MPO website. This technical report is intended to outline the coordination of the CMP and LRTP by highlighting the key decisions and recommendations for consideration of cost feasible projects for the LRTP.

Overview of Report

This report is organized into four sections, including this Introduction.

Section 2 presents the **Process for Identifying Congested Corridors** in Pasco County, including evaluating the causes of congestion. The section describes how congestion is defined and includes a listing of the congested corridors.

Section 3 summarizes the **Corridor Screening** activities undertaken as part of MOBILITY 2040. Using the congested corridors defined in the previous section, strategies that can be used to reduce congestion or improve identified congested corridors are summarized with recommendations for the LRTP.

Section 4 presents the **Future Revisions and Updates** being considered for the CMP as a result of the coordinated planning activities with the LRTP update.

Section 2: Process for Identifying Congested Corridors

Causes of Congestion

The process of congestion management begins by understanding the causes of the congestion. Listed below are the six major causes of congestion identified in a national study conducted by the Federal Highway Administration (FHWA):

- **Bottlenecks** – points at which the roadway narrows or regular traffic demands cause traffic to back up (typically at traffic signals); these are the largest source of congestion and typically cause a roadway to operate below its adopted level of service (LOS) standards.

- **Traffic incidents** – crashes, stalled vehicles, debris on the road; these incidents cause about one quarter of congestion problems. The focus of the Pasco 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** – 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 both major and minor streets.

- **Special events** – cause "spikes" in traffic volumes and changes in traffic patterns; these irregularities either cause delay on days, times, or locations where there usually is none or add to regular congestion problems.

As shown in Figure 2-1, bottlenecks are the largest cause of congestion in the U.S., followed by traffic incidents and bad weather. Bad weather cannot be controlled, but policies and improvements can be implemented to control traffic incidents and bottlenecks. These national data are widely used in CMP updates due to the lack of comprehensive local studies on the causes of congestion. The data suggest that local causes are likely to be similar, with bottlenecks and traffic incidents typically being the top two causes of congestion.
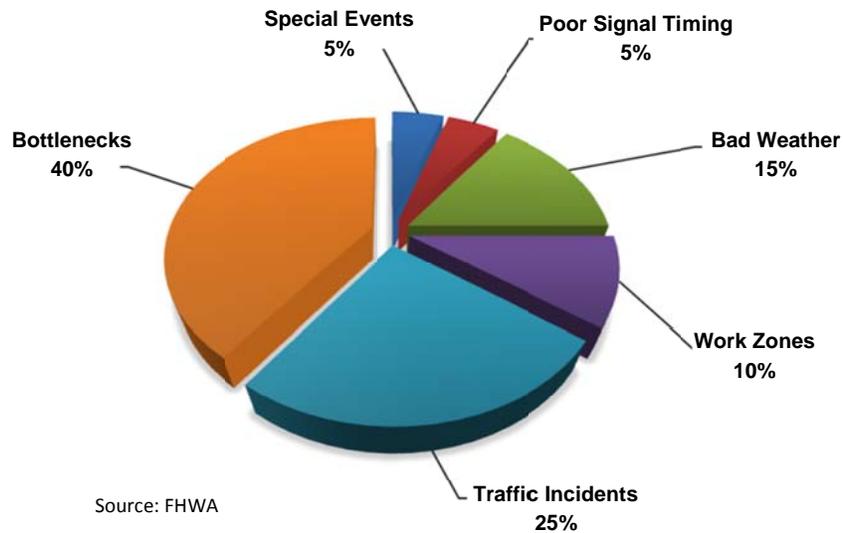
Source: FHWA

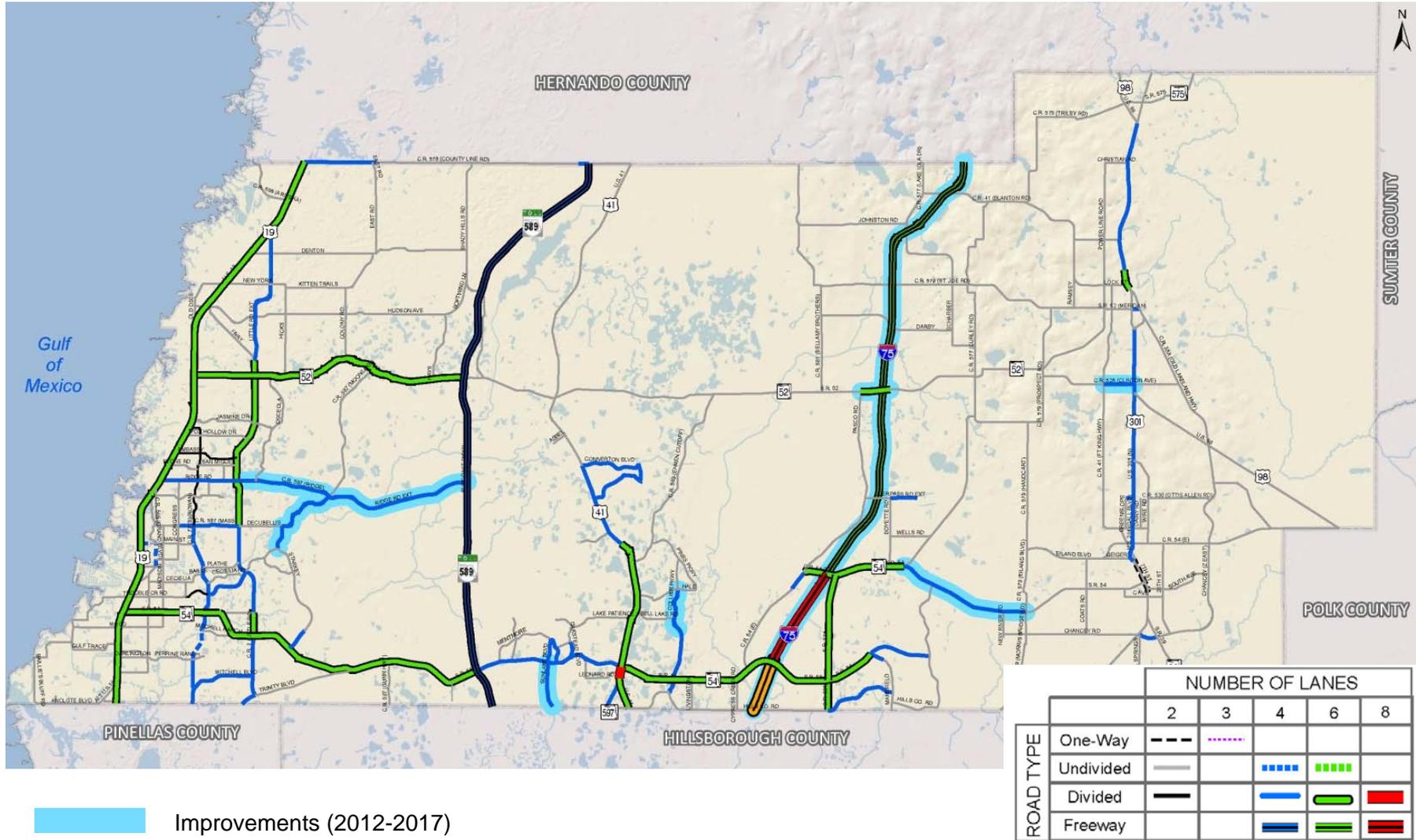**Figure 2-1**
Causes of Congestion

Network Identification

Consistent with federal guidelines, the Pasco County CMP covers a multimodal transportation network. In addition to evaluating congestion on the roadway network, the multimodal evaluation includes transit, bicycle/pedestrian/trail, and freight movement networks within its designated area of application.

The Pasco County CMP roadway network includes all functionally-classified roadways in the adopted LRTP and/or the existing plus committed (E+C) five-year road network (typically the existing condition plus five years).

Map 2-1 illustrates the E+C roadway network used for the evaluation of congested corridors.

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Map 2-1
CMP (Existing + Committed) Roadway Network

Improvements (2012-2017)

ROAD TYPE	NUMBER OF LANES				
	2	3	4	6	8
One-Way	- - -	·······			
Undivided			▪▪▪▪▪	▪▪▪▪▪	
Divided					
Freeway					

Corridor Congestion Levels

The CMP process involves selecting congested corridors that will undergo detailed evaluation for identifying potential projects/programs that potentially can be implemented on the corridors. Annual monitoring efforts are used to review the LOS 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 congested," or "extremely congested," as summarized below

- **Not Congested (currently or in five years with improvements)** – The corridors in this category are not anticipated to operate below their adopted LOS standards in either the existing conditions or after committed improvements in the five-year program are implemented.

- **Approaching Congestion or Congested** – These corridors are approaching congestion or are minimally congested today or after the committed improvements in the five-year program are implemented or are approaching congestion (a 10% increase in traffic will result in a congested condition).

- **Extremely Congested** – This category includes corridors in which the future travel volumes are greater than the physical roadway capacity after the committed improvements in the five-year program are implemented.

Once the roadways are categorized based on these criteria, they are further categorized into one of two broad types:

- **Mobility Corridors** – These include Multi-Modal Transportation District (MMTD) corridors (corridors located in MMTDs) or Key Transit Corridors (corridors with 60-minute or more frequent bus service).

- **Non-Mobility Corridors** – These include all other major roadways included in the E+C road network.

In addition to identifying corridors through technical screening, stakeholders and members of the MPO's advisory committees identify congested problem areas in the CMP/MMS spreadsheet. These corridors are brought to the CMP Task Force, which selects corridors and safety locations for further review.

Section 3: CMP Strategy Screening

Corridor Screening

Once congested corridors are selected for review, they are screened to identify mitigation strategies appropriate for reducing congestion or improving safety to reduce crashes. The Congestion Mitigation Process Strategy Matrix is used to address recurring congestion, and the Safety Mitigation Strategy Matrix is used to address non-recurring congestion. The matrix includes strategies in five tiers, as identified in the Pasco County CMP MPO Strategy Toolbox. The Congestion Mitigation Process 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.

The critical part of the Corridor/Strategy Selection process is corridor screening. Figure 3-1 provides more detail on the process used in screening corridors for additional analysis for the purpose of identifying good candidate projects/programs.

Congestion Mitigation Strategies

A Toolbox of Strategies was developed to assist policymakers and planners in effectively using congestion reduction strategies. As an MPO that exceeds the 200,000 population threshold for a Transportation Management Area (TMA) designation, the Pasco MPO is required to identify these strategies based on travel demand reduction as well as operational strategies. Shown in Figure 3-2 is a full range of potential strategies for managing congestion for the Pasco County multimodal CMP network.

For each of the strategies identified, a toolbox was developed to address congestion in a top-down fashion. The strategies in the toolbox are organized into the following five tiers:

- Strategies to Reduce Person Trips or Vehicle Miles Traveled
- Strategies to Shift Automobile Trips to Other Modes
- Strategies to Shift Trips from SOV to HOV Auto/Van
- Strategies to Improve Roadway Operations
- Strategies to Add Capacity

Figure 3-1
Corridor Screening Process

Steps	Process	CMP Applicability
Screen 1 Screen Five-Year Work Program	**For congested corridors in 2012 (existing) or 2017 (existing plus five years), is there a project in the five-year work program?** The first step is to determine whether congested corridors have a project in the five-year work program. If there is not, then Step 2 will be reviewed.	5-Year Work Program — **Yes, If applicable**
Screen 2 Screen Long Range Transportation Projects (LRTP)	**Is there a project in the LRTP?** If a congested corridor does not have a project in the five-year plan, it will be reviewed to determine if there is an LRTP project on the corridor. These are projects that cannot be fully funded in the five-year work program. It may be possible for certain CMP projects to be implemented earlier on these roadways to alleviate operational issues at specific locations.	Long-Term Projects (10 or 15 years) — **Yes, if applicable**
Screen 3 Screen Congested Corridors	**Are there congested corridors in 2012 or 2017 that do not have a project in the five-year work program or LRTP?** If congested corridors that are deficient do not have a project in the five-year work program (Step 1) or LRTP (Step 2), these corridors should be reviewed for CMP projects. This is typically not the case in Pasco County, as congested corridors are typically either funded in the five-year work program or in the LRTP.	**Yes, if appropriate**
Screen 4 Screen Corridors Approaching Congestion	**Are there corridors approaching congestion by 2017 that can be reviewed for improvements?** Roadways that are approaching congestion are reviewed for possible corridor selection. These roadways represent the "sweet" spot, as these may be conducive to CMP projects such that they will significantly delay the roadways from becoming congested or the need for more costly improvements.	**Yes**

Figure 3-2
Congestion Management Strategies
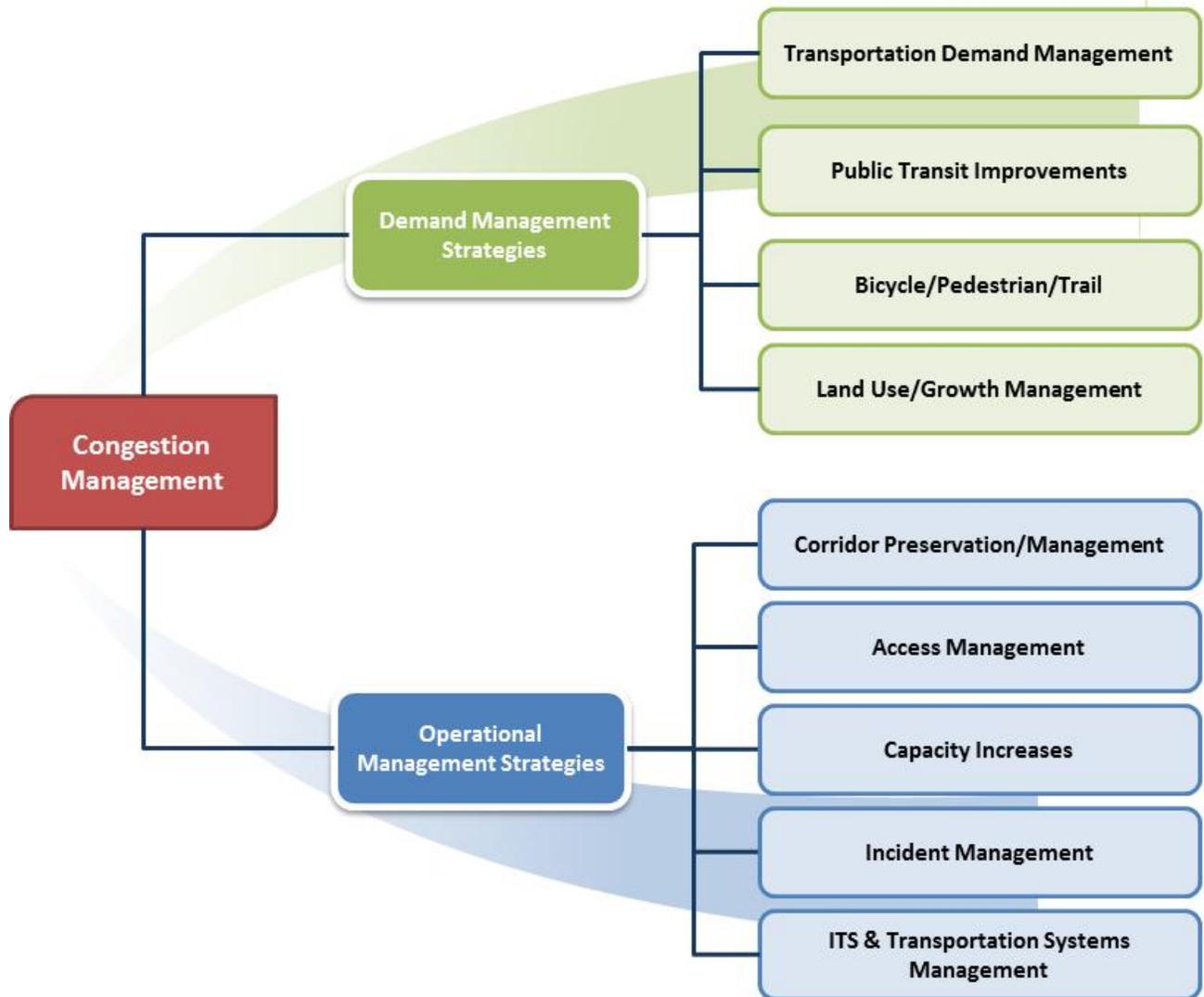
Safety Mitigation Strategies

The identification of potential safety issues in the congested corridors is accomplished by making use of crash data produced by Pasco County'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 CMP roadway network for both congested and non-congested roadways. Reducing the number of crashes that occur on major roadways can reduce non-recurring congestion. Although the delay incurred resulting from crashes cannot be determined easily, they are a significant contribution of delay on major roadways. To support the integration of crash reduction as a means to reduce non-recurring congestion, a CMP Safety Mitigation Matrix was developed.

The CMP Safety Migration Matrix identifies the most common crash types and the typical strategies that can be implemented to improve safety and reduce these crashes. Special consideration is given to relating these crashes to the four Safety Emphasis Areas identified in the State of Florida Strategic Highway Safety Plan. Figure 3-3 highlights these four areas. In most cases, additional detailed study is required to identify the specific safety strategy or strategies to be implemented for a specific location.

Figure 3-3
Safety Emphasis Areas

Vulnerable Users
Crashes involving pedestrians, bicyclists, or motorcyclists, who are more vulnerable to severe injuries or death.

Aggressive Driving
Crashes that include impaired driving, reckless driving, or other crash types that often result in more serious crashes.

Intersections
Intersections are planned conflict points and result in the greatest exposure for crashes to occur. These also are locations where mitigation activities may yield the greatest benefit.

Lane Departures
Crashes that include head-on collisions and run-off-the-road crashes that result in serious crashes, and sideswipe crashes.

Section 4: Future Updates and Recommendations

Recommendations and are presented below that will enhance the CMP and allow more efficiency in the overall MPO planning process. These will be reviewed and considered by MPO staff and the Pasco County Congestion Management Process Task Force for implementation as necessary.

- **Update the *CMP Policy and Procedures Handbook* on a five-year cycle** consistent with the update cycle of the LRTP. Timing of the completion of CMP updates in advance of finalizing the LRTP updates would benefit integration of CMP strategies into the LRTP.

- **Develop an Annual State of the System Report** to track the 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.

- **Implement the selected strategies**, which may include programming them in the County's Capital Improvements Program, identifying corridor studies through the MPO's Unified Planning Work Program (UPWP), or including longer-term projects in the County's Capital Improvements Element or the MPO's Long Range Transportation Plan.

- **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.

- **Include projects identified in the CMP process in the LRTP**, either through the five-year update cycle or through plan amendments.

- **Identify and implement data collection recommendations** for key congestion data and close any data gaps identified in this CMP.

- **Continue to monitor changes** to federal CMP regulations and modify/update the CMP to reflect new requirements.