

**COLLIER MPO
2035 LONG RANGE TRANSPORTATION PLAN**



**CONGESTION MANAGEMENT PROCESS
TECHNICAL MEMORANDUM**

DRAFT DOCUMENT

Prepared For:



November 2010



The preparation of this document has been financed in part through grants from the Federal Highway Administration (CFDA Number 20.205), the Federal Transit Administration (CFDA Number 20.505), the U.S. Department of Transportation, under the Metropolitan Planning Program, Section 104(f) of title 23, U.S. Code, and from Local funding provided by Collier County, the City of Naples, the City of Marco Island, and the City of Everglades City. The contents of this document do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
LIST OF FIGURES.....	iii
LIST OF TABLES.....	iii
LIST OF APPENDICES.....	iii
1.0 INTRODUCTION.....	Error! Bookmark not defined.
2.0 CONGESTION MANAGEMENT PROCESS OVERVIEW.....	2
2.1 Federal Background.....	2
2.2 Collier MPO Congestion Management Process Background.....	3
2.2.1 CMS/ITS Stakeholders Committee.....	4
2.2.2 CMP Project Selection.....	4
2.3 Congestion Management Process Integration.....	7
2.3.1 2035 Long Range Transportation Plan.....	7
2.3.2 Transportation Improvement Program (TIP).....	9
2.3.3 Public Involvement Process.....	11
3.0 EXISTING CONDITIONS.....	11
3.1 CMP Network and Area of Application.....	12
3.1.1 Designated Transit Network.....	12
3.1.2 Designated Bicycle/Pedestrian Network.....	12
3.1.3 Designated Transportation Demand Management Organization.....	12
3.1.4 Intelligent Transportation System Network.....	16
3.2 CMP Network Congested Corridors.....	17
3.2.1 Congestion Definition.....	18
3.2.2 Identification of Deficient Roadways.....	18
3.2.3 Deficient Roadways with CMS Box Projects.....	18
3.3 Safety – High Crash Locations.....	21
4.0 CURRENT CONGESTION MANAGEMENT STRATEGIES.....	22
4.1 CMP Strategy Menu of Options.....	22
4.1.1 Travel Demand Management (TDM).....	23
4.1.2 Transportation System Management (TSM).....	25
4.1.3 Intelligent Transportation Systems (ITS).....	27
5.0 FUTURE CONDITIONS.....	28
6.0 FUTURE CMP STRATEGIES.....	31
6.1 Recommended CMP Strategies.....	31
6.1.1 Travel Demand Management.....	31
6.1.2 Travel System Management (TSM).....	33
6.1.3 Intelligent Transportation System (ITS).....	34
6.2 CMP Strategy Toolbox.....	34
6.3 Evaluation and Performance of CMP Strategies.....	35
6.4 Feedback and Modification of CMP Strategies and Projects.....	35
7.0 RECOMMENDATIONS.....	Error! Bookmark not defined.
7.1 Performance Measures.....	36
7.1.1 Existing CMP Performance Measures.....	36
7.1.2 Future CMP Performance Measures.....	36

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
7.1.3 Recommended Performance Measures	37
7.1.4 Data Sources	40
*7.2 Recommended improvements - CMP Projects.....	40
7.3 CMP Reporting Process	41
7.3.1 CMP Update Cycle	41
7.3.2 Congestion Management Process Performance Report	41

* Not complete/in progress pending completion of 2035 Cost Feasible Plan.

DRAFT

LIST OF FIGURES

Figure 2.1: MPO Planning and Congestion Management Process 2
 Figure 2.2: CMS/ITS Stakeholder Committee Members 4
 Figure 2.3: CMP Project / Program Development Process 6
 Figure 2.4: CMP and Collier MPO Planning Process Integration 7
 Figure 3.1: CMP Network and Area of Application 13
 Figure 3.2: CMP Designated Transit Network 14
 Figure 3.3: CMP Designated Bicycle/Pedestrian Network..... 15
 Figure 3.4: CMP Network LOS 19
 Figure 3.5: Deficient CMP Corridors (2008) and CMS Projects / Priorities 20
 Figure 5.1: Deficient CMP Corridors 2035..... **30**

LIST OF TABLES

Table 2.1: 2009 Congestion Management System Box Project Projects 10
 Table 3.1: CMP Existing + Committed Deficient Roadway Segments, 2008..... 18
 Table 3.2: Top 20 High Crash Locations, 2005 to 2008 21
 Table 3.3: Top 20 Pedestrian and Bicycle Crash Locations, 2005 to 2008 21
 Table 5.1: CMP Deficient Roadway Segments, 2035 Needs Plan 28

LIST OF APPENDICES

APPENDIX A

- A-1: FHWA Congestion Management Process Checklist
- A-2: CMP Project Submission Application/Checklist
- A-3: CMP Major Road Network
- A-4: CMP Transit Network
- A-5: CMP Bicycle and Pedestrian Facilities
- A-6: Regional Transportation Network and Pathway Facilities

APPENDIX B

- B-1: Traffic Management and ITS Information

APPENDIX C

- C-1: Sample CMP Data Acquisition Plan

1.0 INTRODUCTION

A major component of the Metropolitan Planning Organization (MPO)'s Long Range Transportation Plan (LRTP) is the Congestion Management Process (CMP). The CMP is an integrated process to identify the causes of congestion, and develop projects and strategies to address congested locations.

The goals and objectives related directly to congestion management in the 2035 LRTP are intended to improve the efficiency, operation and interconnectivity of the transportation system within Collier County. The benefits realized from an effective congestion management program include improved traffic flow and mobility, safer roadways and intersections, enhanced multimodal options, travel demand reduction, and improved air quality.

The purpose of this Technical Report is to develop the foundation for the Congestion Management Process Element of the 2035 LRTP through the analysis of existing and future congestion conditions; review of the project/program selection process and funding; identification of potential performance measures; and discussion of cost-effective strategies to minimize and alleviate congestion.

Specifically, the report is presented in six major components:

- △ **Congestion Management Process Overview**
- △ **Existing Conditions**
- △ **Current Congestion Management Strategies**
- △ **Future Conditions**
- △ **Future Congestion Management Strategies**
- △ ***Recommendations**

* Not complete/in progress pending completion of 2035 Cost Feasible Plan.

2.0 CONGESTION MANAGEMENT PROCESS OVERVIEW

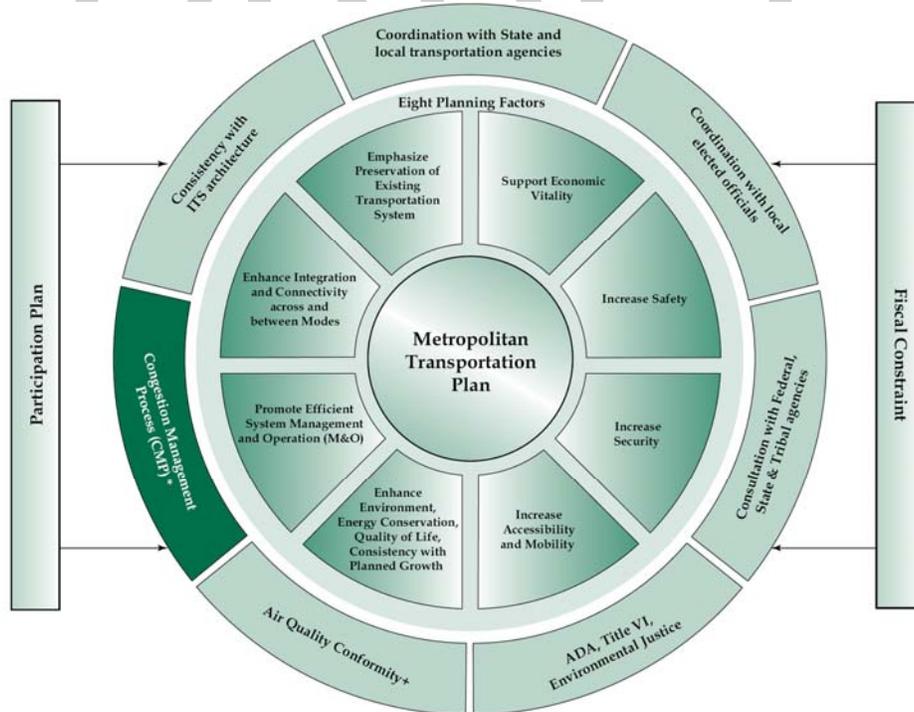
2.1 Federal Background

The Safe, Accountable, Flexible, Efficient, Transportation Equity Act – A Legacy for Users (SAFETEA-LU) requires all Metropolitan Planning Organizations in federally-designated Transportation Management Areas (TMA) to maintain a Congestion Management Process. Based on recently updated federal requirements, the role of the CMP in addressing and managing congestion has considerably expanded from previous legislation.

The Federal Highway Administration (FHWA) defines a CMP as **“a systematic transparent process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing mobility.”**

A CMP recommends a set of multimodal strategies to minimize congestion and enhance the mobility of people and goods. These multimodal strategies include, but are not limited to, operational improvements, travel demand management, policy approaches, and additions to capacity. The CMP also advances the overall goals of the MPO and strengthens the connection between the Long Range Transportation Plan and the Transportation Improvement Program (TIP) (Figure 2.1).

Figure 2.1: MPO Planning and Congestion Management Process



Source: An Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning, U.S. Department of Transportation, Federal Highway Administration, Federal Transit Administration, February 2008.

The

Federal regulation, 23 CFR Part 450.320, identifies the required components for a CMP. These regulations were updated in the Final Rule published in February 2007. The regulations for a CMP are summarized as follows:

1. Methods to monitor and evaluate the performance of the multimodal transportation system, identify the causes of recurring and non-recurring congestion, identify and evaluate alternative strategies, provide information supporting the implementation of actions, and evaluate the effectiveness of implemented actions;
2. Definition of congestion management objectives and appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods;
3. Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions;
4. Identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies that will contribute to the more effective use and improved safety of existing and future transportation systems based on the established performance measures;
5. Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy (or combination of strategies) proposed for implementation; and
6. Implementation of a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures.

As a supplement to SAFETEA-LU requirements, a more detailed checklist was developed by the FHWA Florida Division office in 2007. The Checklist is meant to ensure that all CMPs in the state become fully integrated into the metropolitan planning process. This technical report follows the components of the checklist. The complete checklist is provided in Appendix A-1.

2.2 Collier MPO Congestion Management Process Background

The Collier MPO was created in 1982 and became a TMA when the urbanized area's population reached 200,000. The original ***Naples (Collier County) Congestion Management System Manual*** was developed in 1997 to adhere to the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and the 1995 National Highway System changes requiring the development and implementation of the Congestion Management System (CMS) and Traffic Monitoring System. The MPO completed a major update to the CMS in 2006, which was incorporated into the 2030 LRTP to identify a prioritization process for CMS project funding. The 2006 CMS update also incorporated some of the major process changes required by SAFETEA-LU.

In 2008, the MPO's Congestion Management System/Intelligent Transportation System (CMS/ITS) Stakeholders Committee led an effort to revise the CMS to become a fully integrated process, thereby meeting all federal SAFETEA-LU requirements. The 2008 CMP document includes a complete review and revision of the original Congestion Management System Manual, analysis of congestion strategies, establishment of performance measures, and monitoring and coordination with other countywide plans and systems. The CMP reviews projects that alleviate congestion and do not require right-of-way, while demonstrating quantifiable performance measures.

2.2.1 CMS/ITS Stakeholders Committee

The Congestion Management System/Intelligent Transportation Systems (CMS/ITS) Stakeholders Committee is an essential part of the MPO's CMP. The CMS/ITS Stakeholders Committee provides feedback to staff and the MPO Board to assist in both developing and updating the CMP projects and programs.

The CMS/ITS Mission is to:

“Reduce congestion on our transportation network by using methods other than adding highway lane miles such as: adjusting traffic signal timing, improving intersections (adding/lengthening turn lanes, etc.), modifying medians and investing in transit and pathways for bicyclists and pedestrians.”

The CMS/ITS Committee is responsible for evaluating, selecting, reviewing and submitting candidate corridors and projects to be reviewed through the MPO committee process. The Committee consists of local government planners, engineers, law emergency/enforcement staff, and other key transportation stakeholders appointed by their respective jurisdictions in Collier County. The main goal of the Committee is to serve as the formal body to help guide the development of the CMP projects and programs. **Figure 2.2** provides a listing of the agencies which are included in the CMS/ITS Stakeholders Committee.

Figure 2.2: CMS/ITS Stakeholder Committee Members

<p>City of Everglades City City of Marco Island Public Works Department City of Naples Traffic Operations Department Collier County Alternative Transportation Modes Department Collier County Emergency Management Department Collier County MPO Citizens Advisory Committee Collier County MPO Pathways Advisory Committee Collier County Traffic Operations Department Collier County Transportation Planning Department Florida Department of Transportation – District One</p>
--

2.2.2 CMP Project Selection

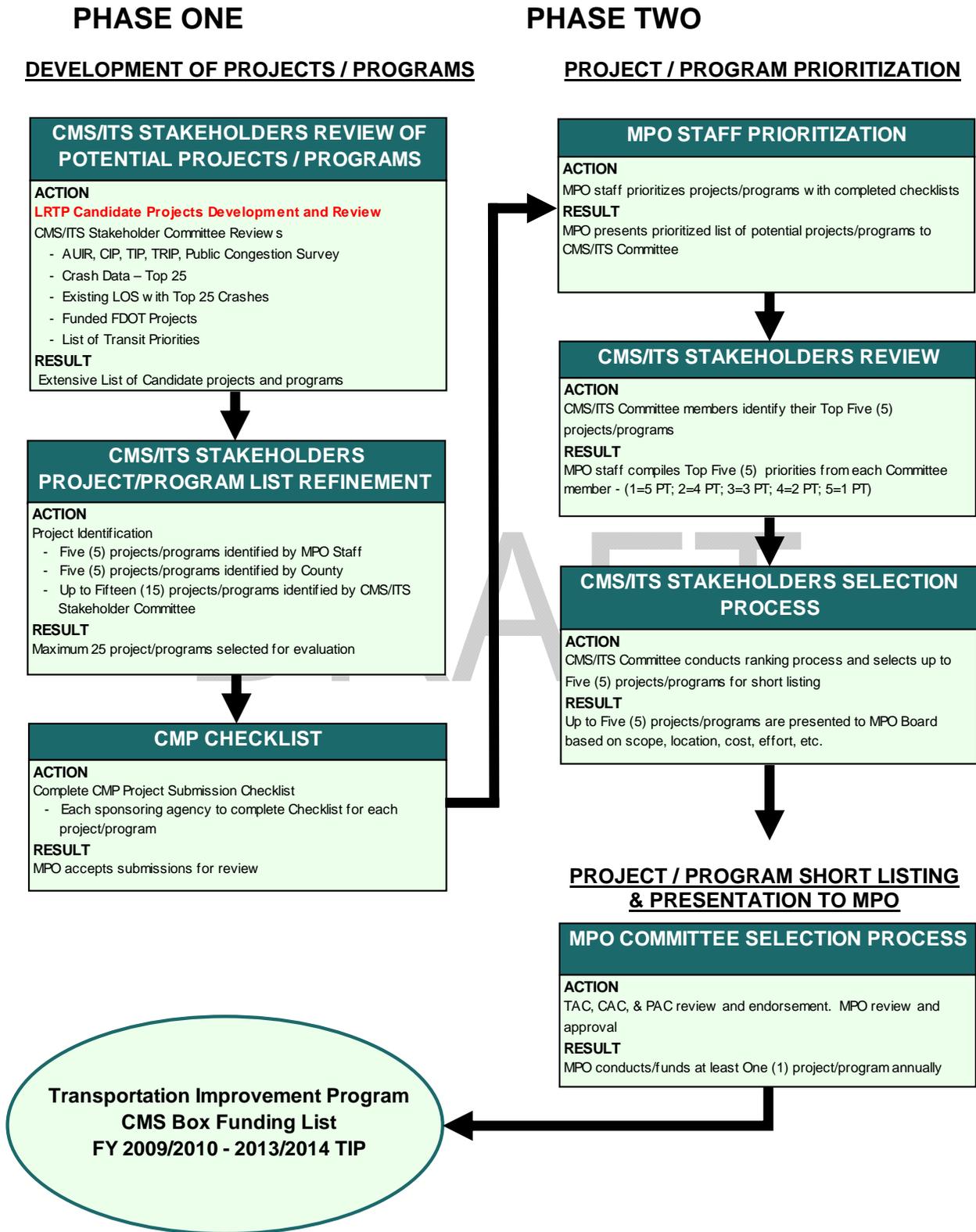
The MPO Congestion Management System/Intelligent Transportation System (CMS/ITS) Stakeholders Committee takes the lead in prioritizing projects and programs for a CMS set-aside (CMS Box). The CMS/ITS Committee makes formal recommendations to the Collier MPO Board for final approval. Eligible projects include corridors which do not meet acceptable levels of service, and where widening projects are not funded within the next five years. In addition, to be eligible for the annual CMS funding allocation, projects cannot require the acquisition of right-of-way from adjacent property owners. Transit and pathways projects will need to demonstrate that they can remove automobiles from congested roadway segments.

Figure 2.3 on page 6 provides an overview of the CMP project and program development process. The process is subdivided into two phases. During Phase One, the MPO and CMS/ITS Committee conduct a selection process for a list of potential projects/programs, which then move forward to Phase Two evaluation. The list of projects and programs are submitted by CMS/ITS Committee members, which includes MPO member governments, the Collier County School Board, Alternative Transportation Modes Department (ATM) and FDOT. During the Tier Two evaluation, all projects/programs are reviewed according to the MPO's CMP Application Checklist. The Checklist enables a prioritization to be completed based on the following six key factors:

1. Does the project/program further the CMS/ITS Goals?
2. Does the project improve road maintenance, reduce injuries or fatalities, reduce delay, improve alternative modes of transportation, TDM, traffic operations or travel affordability?
3. Can the success or failure of implementation of the project be evaluated?
4. Does the result of performance measures further the CMS/ITS goals?
5. Is the project currently within, adjacent to or immediately parallel to another project under construction?
6. Will the project be constructed in coordination with other FDOT projects?

Appendix A-2 contains the complete CMP Project Submission Application/Checklist form.

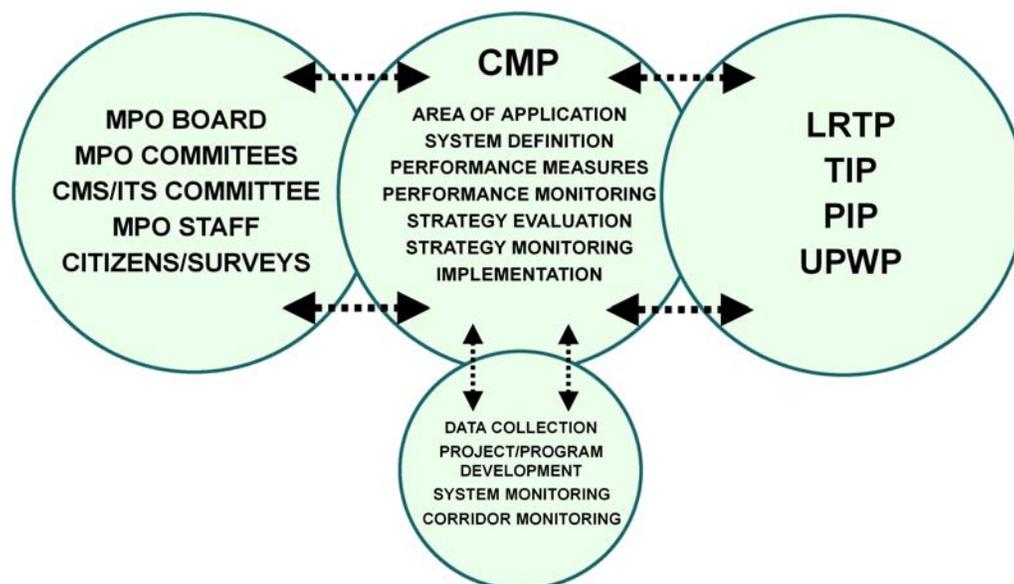
Figure 2.3: CMP Project / Program Development Process



2.3 Congestion Management Process Integration

The CMP is an integral part of the Collier MPO planning process, including the LRTP, the TIP, and public involvement process. It also meets all federal requirements and guidance recently furnished by the U.S. Department of Transportation (USDOT), FHWA, and the Federal Transit Administration (FTA). As displayed in **Figure 2.4**, the CMP is coordinated concurrently with all major MPO planning processes and activities. Integrating the CMP into each MPO program enables the process to be more effective and efficient. It also ensures a multimodal approach is implemented in corridor studies and roadway improvement projects.

Figure 2.4: CMP and Collier MPO Planning Process Integration



2.3.1 2035 Long Range Transportation Plan

The 2035 LRTP provides a comprehensive set of goals and objectives, several of which are closely related to congestion management strategies and improvements. Specifically, they include:

Goal 1: A multi-modal transportation system that is balanced and integrated with all transportation modes to ensure safe and efficient movement of people and goods.

- Objective 1.1 Minimize congestion on roadways and at intersections.
- Objective 1.2 Maintain roadway and other Level of Service (LOS) standards consistent with regional, county and municipal comprehensive plans.
- Objective 1.4 Provide infrastructure that supports intermodal transportation (transit riders, pedestrians, and bicyclists).
- Objective 1.5 Improve intermodal connectivity and access to intermodal facilities (e.g., airports, transit centers, Greyhound, rail, passenger ferries, etc.) and activity centers.

- Objective 1.6 Provide more sidewalks and bikeways.
- Objective 1.7 Improve public transit services so they are efficient, frequent, reliable, convenient, easy to use and understand, and promotes other intermodal uses.
- Objective 1.8 Provide reasonable and accessible regional public transit services.
- Objective 1.10 Maximize transportation network continuity and promote alternative modes of transport (e.g., rail, pipeline and waterways).
- Objective 1.11 Provide efficient truck routes.
- Objective 1.12 Encourage utilization of Transportation Demand Management (TDM).

Goal 2: A transportation system that is safe and secure for existing and future residents, visitors and businesses.

- Objective 2.3 Reduce overall roadway crash rates at intersections and along corridors.
- Objective 2.4 Reduce crash rates that involve conflicts among different modes of transportation through engineering and public education (autos, trucks, buses, trains, motorcycles, pedestrians, and bicyclists).

Goal 3: A transportation system that enhances emergency responsiveness and evacuation

- Objective 3.1 Minimize emergency response time.
- Objective 3.8 Provide support for the ongoing development of ITS infrastructure that will support emergency responders in preventing, reducing and mitigating the effects of incidents.

Goal 5: A sustainable transportation system that enhances economic growth and anticipates development demands.

- Objective 5.1 Minimize congestion on roadways and at intersections.
- Objective 5.2 Improve public transit services so they are efficient, frequent, reliable, convenient, that is easy to use and understand and promotes other intermodal uses.
- Objective 5.3 Improve intermodal connectivity and access to intermodal facilities (e.g. airports, transit centers, Greyhound, rail, passenger ferries, etc.) and activity centers.
- Objective 5.4 Provide safe, secure and efficient movement of freight and goods throughout the transportation system.

Goal 6: A transportation system that is maintained, optimized and expanded using the best available technologies and innovations.

- Objective 6.1 Construct and maintain multi-modal infrastructure to standards that minimize their lifecycle costs.
- Objective 6.2 Identify and implement the best available technologies and innovations to improve the reliability of the transportation system. Maximize the use of Intelligent Transportation System (ITS) technologies.
- Objective 6.3 Reduce roadway congestion by maximizing ITS technologies, e.g., efficiently route traffic to alternate routes and divert around congested corridors or incidents.
- Objective 6.4 Reduce peak period vehicular travel using Travel Demand Management measures (e.g., variable pricing, carpooling, vanpooling, telecommuting, flexible work hours, HOV tolling).
- Objective 6.6 Provide more transportation corridors connecting activity centers
- Objective 6.7 Increase mixed use development and densities along major transit corridors.

Goal 8: A transportation system that is coordinated through local, regional and state agencies and based on effective integration of transportation, land use, conservation and smart growth planning.

- Objective 8.3 Facilitate intermodal connections.
- Objective 8.4 Maximize connections between adjacent land uses.
- Objective 8.5 Apply transportation and land use planning techniques that support intermodal connections and coordination.
- Objective 8.6 Apply enhanced access management standards and strategies in corridors of regional significance.

2.3.2 Transportation Improvement Program (TIP)

As part of the prioritization process, the MPO annually sets aside a funding “box” of its Federal transportation funding share for CMP projects that relieve congestion on corridors that do not meet the defined acceptable level of service standards by the MPO and member agencies. The funding box was combined with the MPO’s Pathway box for two years. The 2013/14 box is \$4.2 million and the 2014/15 box is \$5 million. The MPO Board approved the list of CMS Box Fund Priorities on May 8, 2009. A total of 13 projects were prioritized to be considered for future funding through the TIP process (**Table 2.1**). The projects are displayed in Figure 3.5.

Table 2.1: 2009 Congestion Management System Box Projects - FY 2009/2010 to FY 2012/2013

MPO Rank	Project	Phase	Requested funding	Location	ROW Required	Benefits (Reduced Delay, Safety, etc.)	Responsible Agency	Cumulative Cost of the Projects
1	Expand SCOOT at 5 intersections on Airport Road	Installation and Implementation	\$ 200,000	Airport Road - Clubhouse Drive / Rustic Oak Circle to Estuary Drive / Halstett Drive	No	1. Reduce delay, 2. improve traffic operations, and 3. provide constant and real time automated traffic data collection and measures of effectiveness	Collier County Traffic Operations	
2	Install 12 bus shelters. Each shelter is \$23,000.	Design and Construction	\$ 276,000	Misc. at CAT bus stops	No	1.Reduce injuries or fatalities, 2. improve alternative modes of transportation, 3. improve travel affordability.	Collier County ATM	\$ 476,000
3	Intersection improvements at US 41 at Golden Gate Pkwy-extend turn lanes	Design and Construction	\$ 175,000	US 41 at Mooring Line Drive and US 41at GGP	No	1. Decrease maintenance, 2. reduce injuries, 3. reduce delay, 4. reduce travel distance, 5. improve traffic operations, 6. improve travel affordability and 7. increase capacity	City of Naples	\$ 651,000
4	Intersection improvements at Davis Blvd. (SR 84) and Shadowlawn Drive-add turn lanes	Construction	\$ 250,000	SR 84 at Shadowlawn Drive	No	1. Reduce injuries and fatalities, 2. reduce delay, and 3. improve traffic operations.	Collier County TECM	\$ 901,000
5	Install pedestrian features at intersection of US 41 and Pelican Bay Blvd. North- Provide Ped Crossing	Design and Construction	\$ 100,000	US 41 and Pelican Bay Blvd. North	No	1. Reduce delay, 2. improve alternate modes of transportation, and 3. improve travel affordability	Collier County Traffic Operations	\$ 1,001,000
6	Intersection improvements at the SR 29 and Lake Trafford Intersection.	Construction	\$ 750,000	SR 29 and Lake Trafford Road in Immokalee	No	1.Reduce injuries or fatalities, 2. reduce delay, 3. improve alternative modes of transportation, and 4. improve traffic operations.	Collier County TECM	\$ 1,751,000
7	Install bike lanes and sidewalk on SR 84.	Design and Construction	\$ 800,000	Along SR 84 (Davis Blvd) 1. Bike lanes from Florida Club Circle to SBB and 2. 6' sidewalk on south side of the road from County Barn Road to SBB.	No	1. Improve alternate modes of transportation, 2. use a TDM strategy, and 3. improve travel affordability.	FDOT	\$ 2,351,000
8	Install a second westbound left-turn lane at the intersection of Green Blvd. and Santa Barbara Blvd.	Design and Construction	\$ 300,000	Green Blvd. and Santa Barbara Blvd.	No	1. Reduce delay, and 2. improve traffic operations.	Collier County Traffic Operations	\$ 2,851,000
9	Congestion Study	Study						
10	Airport Road and North Horseshoe Drive-add turn lane					No Data Provided		
11	Signal System analysis by road segment-corridor					No Data Provided		
12	Missing links programs					No Data Provided		
13	Immokalee High School sidewalk and 4 way stop					No Data Provided		
	Total CMS Box Funding - \$1,652,645		\$ 2,851,000					

Source: Collier County MPO, adopted June 12, 2009

2.3.3 Public Involvement Process

The Public Involvement Plan (PIP) provides a comprehensive process for public involvement in the MPO planning process and development of the LRTP. In addition, the online Congestion Management System Report enables citizens the opportunity to provide comments and feedback regarding congested corridors, congestion locations and other pertinent issues in Collier County. The online Congestion Reporting system enables citizens to become more directly involved in the CMP and project/program prioritization process. Feedback from the public is investigated whether identified corridors and segments either have a congestion problem or may be a potential congested facility in the future. Feedback is submitted online at: <http://www.trafficincollier.com>; or written comments may be submitted by mail to the MPO.

DRAFT

3.0 EXISTING CONDITIONS

The primary goal of the CMP is to improve system performance by alleviating congestion through alternatives to enhance the mobility of persons and goods. Therefore, the CMP transportation network comprises a roadway network, transit network and bicycle and pedestrian networks, as well as programs that support freight and goods movement and travel demand management (TDM). The following section provides a summary of existing conditions within the MPO's CMP network.

3.1 CMP Network and Area of Application

The congestion management process covers all of Collier County. This includes unincorporated Collier County, City of Naples, City of Marco Island, and Everglades City. The CMP Network includes specific roadway facilities identified in the 2008 Collier County Annual Update and Inventory Report (AUIR), and additional thoroughfares in the cities of Naples and Marco Island. Information obtained for the City of Naples and Marco Island were derived from City of Naples Comprehensive Plan, Transportation Element (2006); and the Marco Island 2009 Annual Level of Service Report, consisting of 2004 average daily traffic count data.

The CMP Bicycle and Pedestrian Network includes all areas presently served by bicycle and pedestrian facilities defined in the Collier County Comprehensive Pathways Plan. The CMP Transit Network includes all roadways served by transit as defined in the Collier County Transit Development Plan (TDP) (**Figure 3.1**). Appendix A-3 contains the complete listing of all CMP network roadways.

3.1.1 Designated Transit Network

Figure 3.2 depicts the existing CMP transit network in Collier County. The network includes all current CAT fixed bus routes. Appendix A-4 contains the complete listing of existing and committed CAT routes within Collier County.

3.1.2 Designated Bicycle/Pedestrian Network

Figure 3.3 depicts the existing CMP network of on-road bicycle and pedestrian facilities (sidewalks). Bicycle facilities inventoried by the MPO include paved shoulders, bicycle lanes or shared use pathways. The MPO also inventoried sidewalks. This information is derived from the draft update of the Comprehensive Pathways Plan. Appendix A-5 contains the inventory of existing and committed bicycle and pedestrian facilities in Collier County.

3.1.3 Designated Transportation Demand Management Organization

The CMP network is served by TDM services and programs. Specifically, Collier County is now served by the newly formed FDOT Commuter Services Program. Initiated in 2007, Commuter Services is operated by FDOT District One and promotes ride-share matching and vanpools, and information on transit services to residents in all 12 counties. A district-wide database provides data on all registered carpool and vanpool participants in Collier County. As part of the CMP, carpool and vanpool registration and occupancy statistics will be monitored on a regular basis.

Figure 3.1: CMP Network and Area of Application

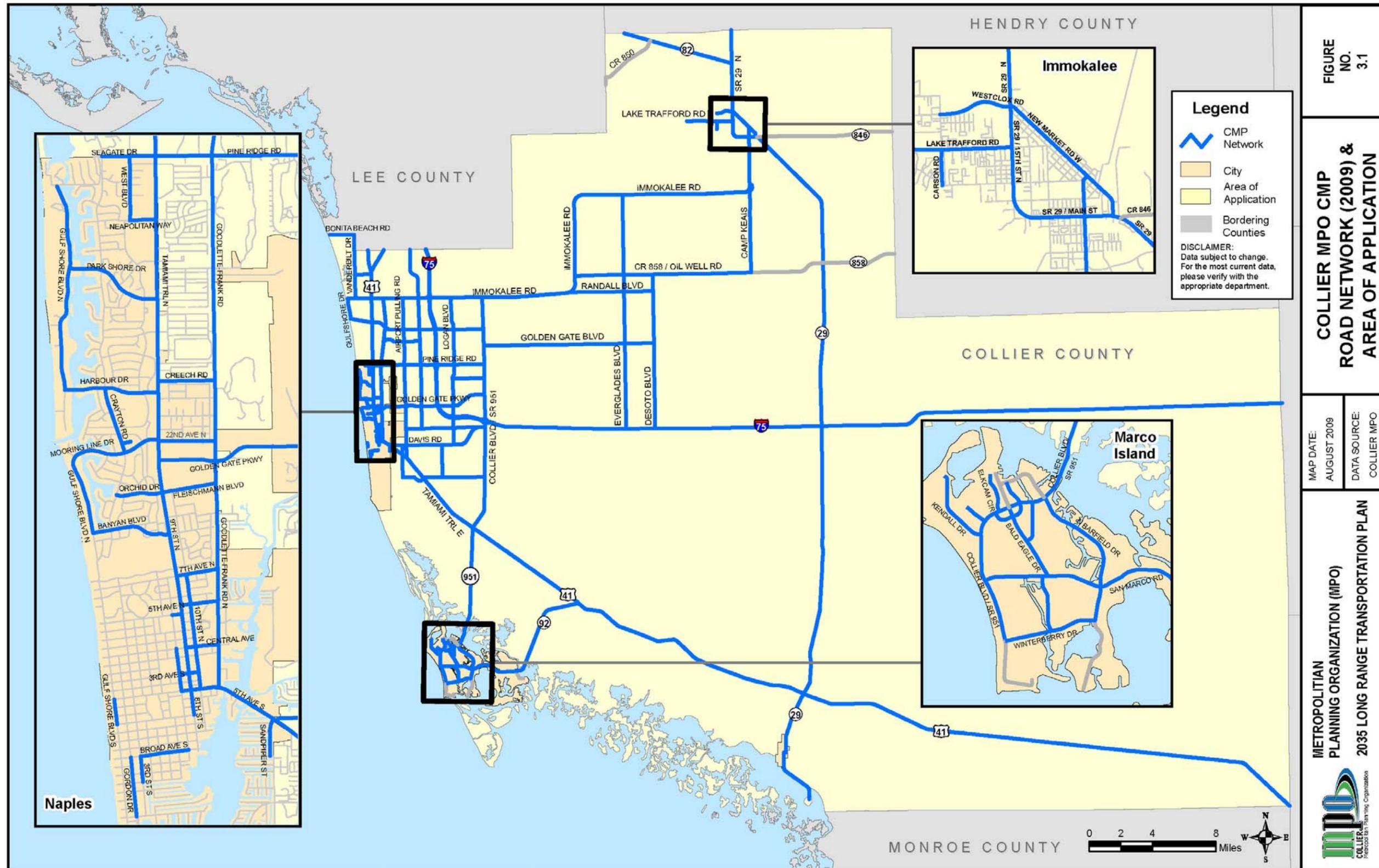


Figure 3.2: CMP Designated Transit Network

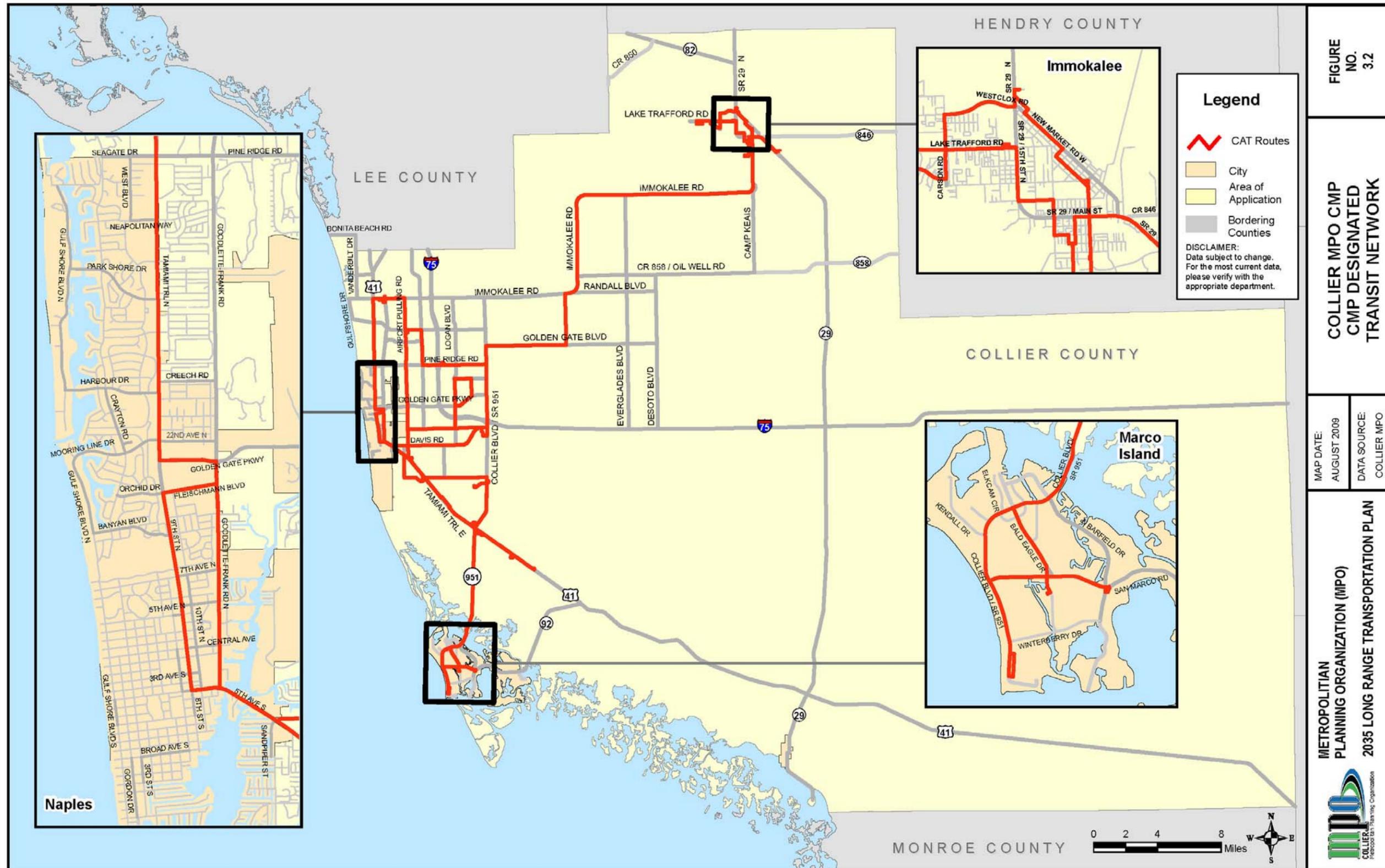


FIGURE NO. 3.2

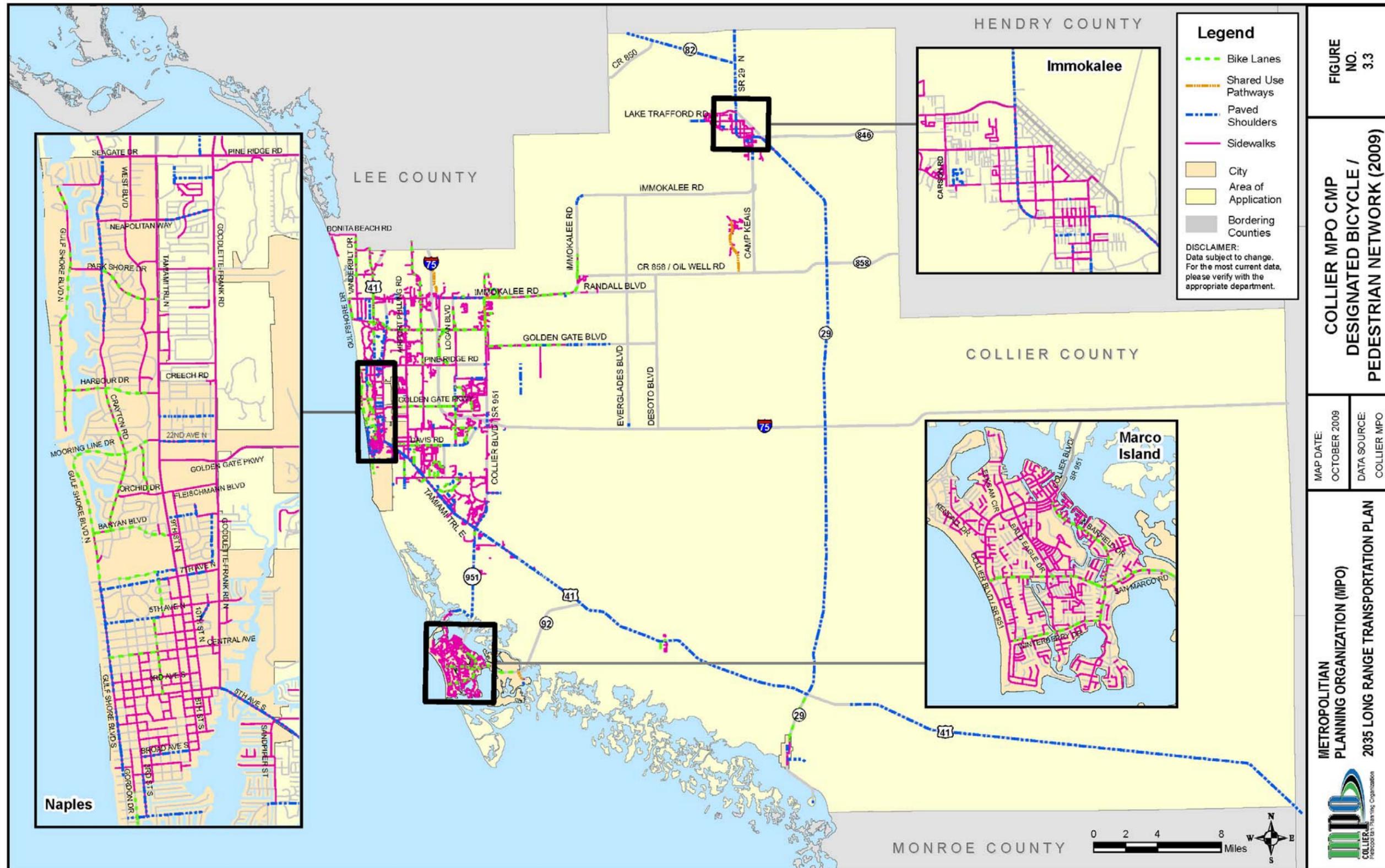
COLLIER MPO CMP DESIGNATED TRANSIT NETWORK

MAP DATE: AUGUST 2009
DATA SOURCE: COLLIER MPO

METROPOLITAN PLANNING ORGANIZATION (MPO)
2035 LONG RANGE TRANSPORTATION PLAN



Figure 3.3: CMP Designated Bicycle/Pedestrian Network



3.1.4 Intelligent Transportation System Network

Collier County is working in partnership with municipalities and FDOT District One to deploy transportation system management through the implementation of intelligent transportation systems (ITS).

Regional ITS

Major components of the existing and on-going expansion of the ITS include:

- ◆ FDOT District One Regional ITS
 - Southwest Florida Regional ITS Architecture
 - Blueprint for ITS in region over next 20 years
- ◆ Regional Transportation Management Center (RTMC)
 - Southwest Interagency Facility for Transportation (SWIFT) SunGuide Center
 - Functional Hub of I-75 ITS, Freeway Management System (FMS)
 - Incident Management
 - Located at Daniels Parkway rest area
- ◆ Communication with Florida Highway Patrol, Fire Rescue, Emergency Response
- ◆ Electronic toll collection (e.g., I-75 Alligator Alley)
- ◆ I-75 Freeway Incident Management System
 - Fiber optic cables
 - Wireless communication
 - Dynamic Message Signage
 - Dynamic Trailblazers
 - Highway Advisory Radio
 - CCTV monitoring
 - Traffic Detection Stations
 - Archived Data
- ◆ I-75 Complimentary ITS Deployment
- ◆ ITS Field Service Devices, County Roadways
- ◆ FDOT Emergency Operations Center (EOC)
 - FDOT District One Headquarters, Bartow
- ◆ Advanced Traffic Management System (ATMS)
 - Collier County
 - City of Naples
- ◆ Traffic Signal Control System
 - City of Marco Island

Advanced Traffic Management System (ATMS)

Collier County ATMS

The Collier County Traffic Operations Department maintains the County Advanced Traffic Management System (ATMS) program for state and county roadways. The County's ATMS was designed and built in two phases, beginning in 2001 and officially ending in June 2008. The Florida Department of Transportation funded these improvements. Collier County continues to expand the reach of the physical network and add ITS modules to the ATMS through county-funded road projects and other

outside funding sources. The ATMS includes over 100 online intersections, over 50 monitoring cameras, and 20 intersections under adaptive traffic control. The system is fully fiber optic and operates over a gigabit Ethernet network. Currently the system covers unincorporated Collier County west of Collier Boulevard. The ITS modules in place include an adaptive traffic system (SCOOT), arterial monitoring cameras, and traffic signal pre-emption (Opticom). Traffic signals are monitored and controlled via the ACTRA system in conjunction with Eagle traffic signal controllers.

The Traffic Operations Department runs a central Traffic Management Center (TMC), in which staff can manage traffic in real time through the use of on-street arterial monitoring cameras. Staff has the ability to modify traffic patterns as conditions warrant. In addition to the system's benefits in managing congestion, it has vastly improved the way that technicians are dispatched on trouble calls. Over the last year and a half, the County has invested in wireless detection (Sensys and Wavetronix) to create permanent count stations. The goal is to fully replace hose counts with system counts for reasons of safety and also to automate the reporting process.

The Collier County Traffic Operations Department maintains all of the traffic signals, roadway lighting and signage in unincorporated Collier County. In addition, the Department maintains the Split Cycle Offset Optimization Technique (SCOOT) program. SCOOT is an adaptive traffic signal system which responds automatically to fluctuations in traffic flow through the use of on-street detectors embedded in the roadway. Installation of SCOOT facilities are meant to reduce travel delay on heavily traveled arterial corridors in the County. Collier County initially implemented the SCOOT system on 15 intersections on Pine Ridge Road in spring/summer 2006. Six additional intersections were integrated into the SCOOT system during 2008/2009. Two expansions of the system are planned for 2010: four intersections on Airport Road will be added, funded with CMS funds, and eight intersections on Immokalee Road will be added, funded by a grant from the U.S. Department of Energy.

In 2009, the MPO awarded funding for the installation of Opticom receivers for Collier Emergency Medical Services.

City of Naples ATMS

The City of Naples operates and maintains a traffic control center and ATMS network. Traffic signals are monitored and controlled via a fiber optic system, including US 41 (SR 45).

City of Marco Island Traffic Control System

The City of Marco Island operates and maintains a Traffic Control System, which consists of an interconnected electronic system that controls a network of ten intersections with traffic signals. The City's system is planned to connect with FDOT's regional ITS discussed above through the use of traffic sensor, video surveillance, and traffic flow controls.

Maps of the Collier County and City of Naples ATMS networks and monitoring cameras are contained in Appendix B-1.

3.2 CMP Network Congested Corridors

An important part of the CMP is defining congestion, and identifying congested facilities. The following section provides a summary of congested locations and the high crash locations within the MPO's CMP Network.

3.2.1 Congestion Definition

Congestion is defined as a corridor operating at a level of service (LOS) that exceeds the adopted concurrency LOS standard for the defined segment. This information is derived from using calculated service volume tables referenced in the AUIR and municipal comprehensive plans. Locations that exceed the concurrency LOS are considered potentially congested segments (**Figure 3.4**). In addition, the ratio of traffic volumes to the maximum service volumes at the LOS standard (volume to standard ratio, e.g. v/c) which exceed a ratio of 0.80 and are projected to fail within five years, are also considered potentially congested segments, classified as deficient.

3.2.2 Identification of Deficient Roadways

The defined CMP Network is used for identifying congested corridors. On a regular basis, the MPO has goes through the process of identifying and ranking those corridors, defined as Deficient Roadways, classified as most significant to Collier County, in order to focus the limited transportation resources. The facilities within the CMP network are outlined in **Table 3.1** and shown in **Figure 3.5**.

Table 3.1: CMP Existing + Committed Deficient Roadway Segments, 2008

Corridor Segment	From	To	Lanes	Vol.	Cap.	LOS
CR 846 - Immokalee Road	Livingston Road	I-75	4D	3,068	2,320	F
CR 846 - Immokalee Road	I-75	Logan Boulevard	4D	2,541	2,320	F
CR 846 - Pine Ridge Road	Livingston Road	I-75	6D	4,186	3,730	F
CR 862 - Vanderbilt Beach Rd	US 41	Goodlette-Frank Road	4D	1,756	1,820	E
CR 862 - Vanderbilt Beach Rd	Goodlette-Frank Road	Airport Road	4D	2,158	1,820	F
CR 887 - Old US 41	Lee County	US 41	2U	1,013	1,010	F
CR 951 - Collier Boulevard	Golden Gate Parkway	Green Boulevard	6/4D	2,195	2,180	F
CR 951 - Collier Boulevard	Vanderbilt Beach Road	Golden Gate Boulevard	6D	2,414	2,450	E
CR 951 - Collier Boulevard	I-75	Davis Boulevard	4D	3,250	3,000	F
Golden Gate Boulevard	E/O Everglades	DeSoto County	2U	1,162	1,010	F
Golden Gate Boulevard	Wilson	E/O Everglades	2U	1,167	1,010	F
Parkshore Drive	Gulf Shore Boulevard	US 41 – Tamiami Trail	2D	1,679	*1,660	D
SR 82	Lee County Line	SR 29	2U	788	875	D
SR 84 - Davis Boulevard	Radio Road	Collier Boulevard	4U	1,668	1,530	F
SR 84 - Davis Boulevard	Santa Barbara Blvd	Radio Road	2U	1,070	1,040	F
SR 951	US 41	Wal-Mart Driveway	6D	2,600	2,370	F
SR 951	Wal-Mart Driveway	Manatee Road	4D	2,094	1,970	F
US 41 - Tamiami Trail East	Collier Boulevard	San Marco Drive	2U	1,204	1,075	F

*Level of Service C Peak Hour

Source: 2008 Collier County Annual Update Inventory Report; City of Naples Comprehensive Plan, Transportation Element

3.2.3 Deficient Roadways with CMS Box Projects, FY 2009/10 – 2013/2014 TIP

The CMS Box projects, as displayed in **Table 2.1**, are also depicted in **Figure 3.5**. For some projects (e.g., install Bus Shelters), a physical location cannot be depicted on the map. The location of two TIP projects is also displayed. As shown, one CMS Box project priority (#9) and one TIP project (#2) will directly impact the deficient roadway segments on SR 84 (Davis Road) and US 41 (Tamiami Trail East).

Figure 3.4: CMP Network LOS

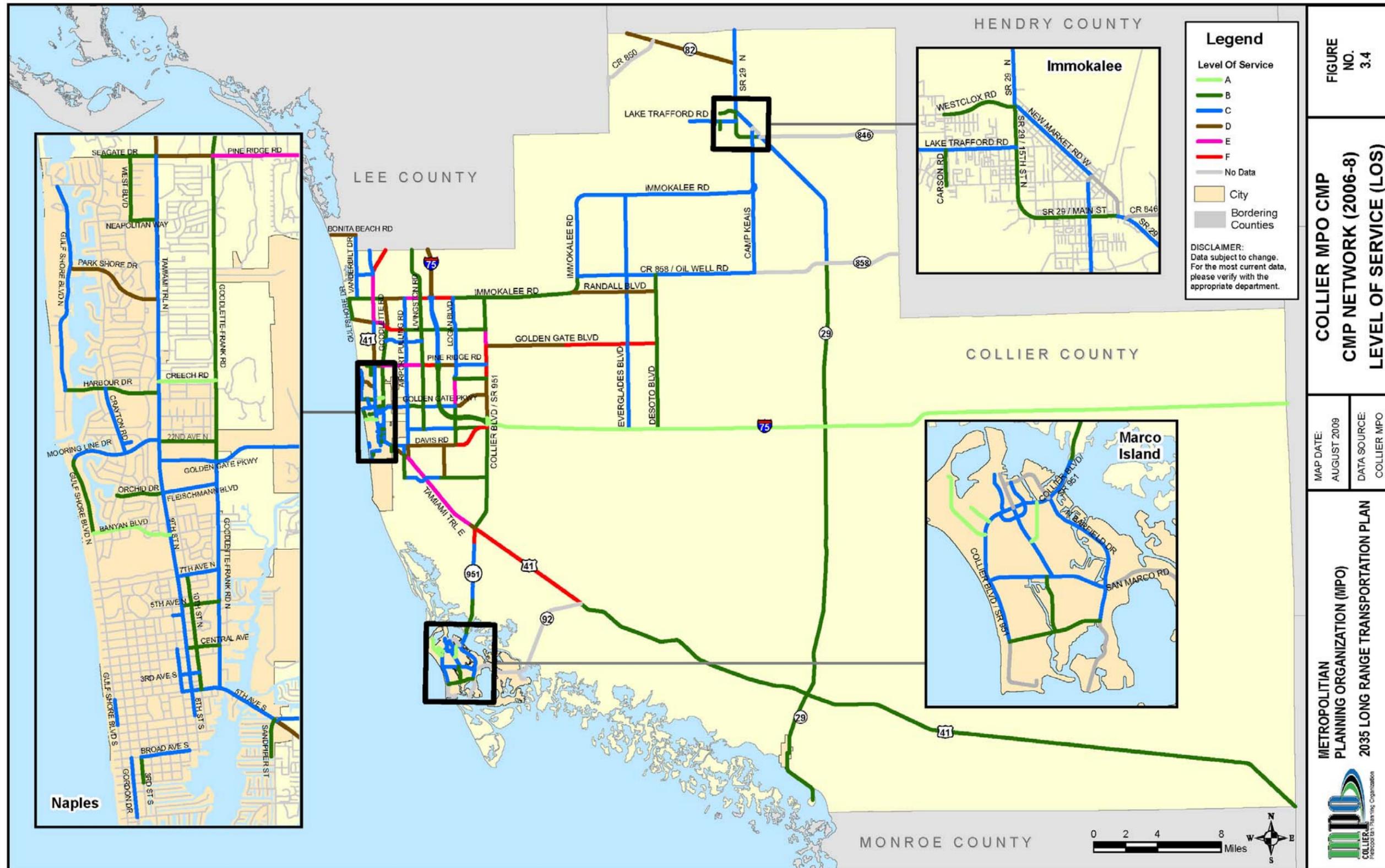
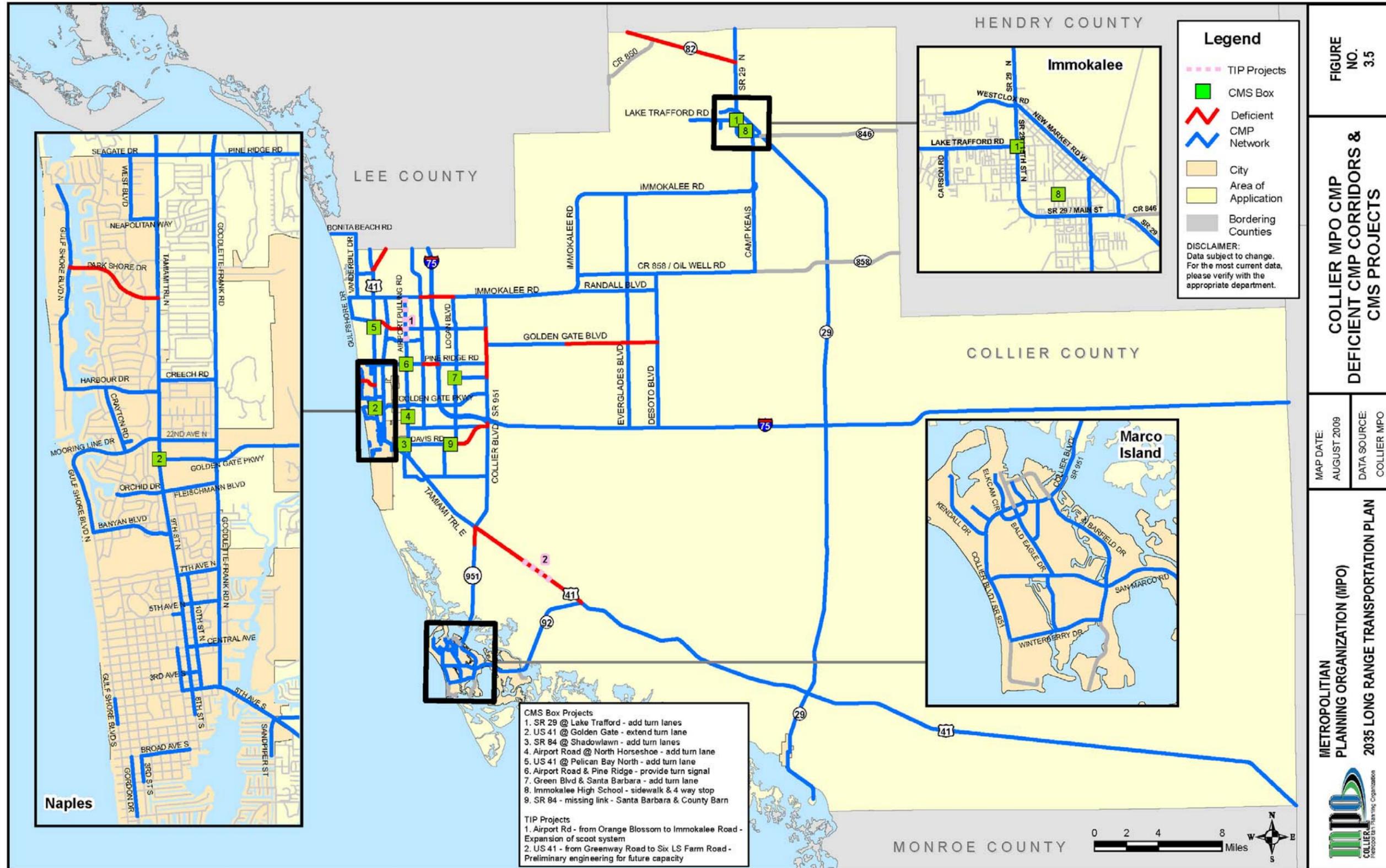


Figure 3.5: Deficient CMP Corridors and CMS Projects / Priorities (2008)



3.3 Safety – High Crash Locations

Traffic crashes include the total number of crashes on the roadways within the defined CMP Area, including both injuries and fatalities, and bicycle and pedestrian crashes. **Table 3.2** displays the Top 20 node crash locations by frequency on the CMP network in Collier County. This includes crashes from 2005 to 2008. **Table 3.3** displays the Top 20 node Pedestrian and Bicycle crash locations from 2005 to 2008.

**Table 3.2: Top 20 High Crash Locations, 2005 to 2008
(Based on crash frequency)**

Node	On Street	Cross Street	Fatalities	Injuries	Crashes
03 888004	I-75	MM 80 (SR 29)	16	212	524
03 888109	I-75	MM 101 (Collier Blvd)	15	143	402
03 5073	Pine Ridge Road	Airport Road	0	12	376
03 6494	US 41	Imm. Road/111 th Ave	1	22	353
03 888002	I-75	Immokalee Road	0	29	337
03 5075	Pine Ridge Road	Livingston Road	1	30	328
03 2790	Airport Pulling Road	Davis Boulevard	0	29	327
03 5748	Livingston Road	Vanderbilt Beach Road	0	9	294
03 888105	I-75	MM 111 (Imm. Road)	3	80	284
03 6510	Livingston Road	Immokalee Road	0	22	281
03 3415	Davis/Beck Boulevard	Collier Boulevard	1	21	277
03 5051	US 41	Pine Ridge/Seagate	0	18	271
03 5932	Vanderbilt Beach	Tamiami Trail	0	28	268
03 3935	Airport Road	Golden Gate Parkway	0	19	259
03 888003	Pine Ridge Road	I-75	2	36	251
03 5086	Santa Barbara/Logan	Pine Ridge Road	0	46	246
03 1323	Collier Boulevard	Tamiami Trail	2	45	242
03 6502	Airport Road	Immokalee Road	0	14	240
03 888001	Collier Boulevard	I-75	6	60	238
03 3984	Santa Barbara Blvd	Golden Gate Parkway	0	20	223

Source: 2009 Collier County CDMS – Crash Data Summary Report

**Table 3.3: Top 20 Pedestrian and Bicycle Crash Locations, 2005 to 2008
(Based on crash frequency)**

Node	On Street	Cross Street	Crashes
03 2790	Davis Boulevard	Airport Road	12
03 2484	Tamiami Trail	Bayshore Drive	12
03 2404	US 41	Airport Road	10
03 7800	SR 29	Immokalee Road	8
03 2788	Davis Boulevard	Miscellaneous	8
03 6494	US 41	Immokalee Road	7
03 4194	Golden Gate Parkway	Coronado Parkway	7
03 5932	US 41	Vanderbilt Beach Road	7
03 7838	SR 29	Roberts Avenue	7
03 2671	Glades Blvd/Francis	Airport Road	6
03 5073	Airport Road	Pine Ridge Road	6
03 2920	Airport Road	Estey Avenue	5
03 4240	Golden Gate Parkway	Sunshine Boulevard	5
03 7797	SR 29	North/South 3 rd Street	5
03 2672	US 41	Commercial	5
03 4713	17 th Avenue SW	Sunshine Boulevard	5
03 3310	Davis Boulevard	Radio Road	4
03 2901	US 41	10 th Street South	4
03 3221	Airport Road	Westview Drive	4
03 7896	North/South 9 th Street	Immokalee Road	4

Source: 2009 Collier County CDMS – Crash Data Summary Report

4.0 CURRENT CONGESTION MANAGEMENT STRATEGIES

The main purpose of CMP strategies is to improve the efficiency and operation of the transportation system through a variety of cost-effective improvements and programs. Federal regulations specify that all reasonable congestion management strategies should be evaluated and deemed inappropriate or infeasible by the MPO prior to considering an increase in capacity as a congestion management measure.

In general, congestion management strategies focus on:

- ◆ Reducing single occupant vehicle use;
- ◆ Promoting alternative travel modes; and
- ◆ Better managing the existing CMP network.

4.1 CMP Strategy Menu of Options

Three major groups of CMP strategies have been identified and are currently evaluated by the MPO as a means to manage congestion. The following section provides a menu or toolbox of strategies from these three groups that may be implemented at the project/program level to address congestion within the CMP network. More detailed descriptive information is also provided for each strategy to serve as a guideline for CMP projects and programs.

Travel Demand Management (TDM)

- ◆ Commuter Services
- ◆ Transit
- ◆ Park and Ride Facilities
- ◆ Bicycle/Pedestrian Improvements
- ◆ Growth Management

Transportation System Management (TSM)

- ◆ Intersection and Signal Improvements
- ◆ Special Events and Management Strategies
- ◆ Incident Management

Intelligent Transportation System (ITS)

- ◆ ITS Regional Architecture
- ◆ County Split Cycle Offset Optimization Technique
- ◆ Open Road Tolling
- ◆ Toll Collection Alternatives
- ◆ Automatic Vehicle Locator
- ◆ Motorist Information
- ◆ Incident Management
- ◆ Software Improvements
- ◆ Information to Media

4.1.1 Travel Demand Management (TDM)

Commuter Services

Commuter services consists of programs and projects to encourage the use of alternative modes of transportation, and a more efficient usage of transportation than driving alone, such as carpools and vanpools. They involve marketing and promotion of alternatives to driving alone, ride-matching services, incentives such as parking cash outs or direct subsidies for use of an alternative, and guaranteed rides home. TDM also includes strategies to reduce peak hour travel such as flexible work hours or to eliminate certain trips altogether, such as telecommuting.

TDM strategies work best for areas in which there is a large concentration of commuters who generally have the same travel schedules. Large employers with well-defined shifts are also good target for TDM promotions. Additionally, it is important for the TDM agency (FDOT Commuter Services) to market its services directly to employers and commuters throughout the defined service area. Currently, the FDOT District One Commuter Service Program provides carpooling and vanpooling matching services to employers and employees throughout Collier County and other counties within the District (<http://www.commuterservicesfl.com>).

Transit

Programs focused on maintaining and optimizing the existing CAT route system, such as improving service and route connections, can be another way to divert auto trips to a more efficient mode. Operational improvements can attract additional riders and include:

- ◆ More frequent service;
- ◆ Longer hours of service;
- ◆ Reduced fares;
- ◆ More direct routing between major origins and destinations; and
- ◆ Faster service via:
 - Express or limited stop service
 - Shuttles
 - Eliminating or consolidating stops
 - Improved transfers between intersecting routes.

Capital improvements on the other hand, only require an initial investment and occasional replacement costs. They can also be effective in making transit service more attractive, including:

- ◆ New vehicles;
- ◆ Better passenger amenities at bus stops such as:
 - Signage
 - Lighting
 - Seating
 - Shelters
 - Sidewalk connections to bus stops and shelters
 - Schedule information

- Next bus arriving information delivered by Dynamic Message Signs (DMS), websites, wireless devices
- Bus pull-out lanes
- Safe, well-marked, illuminated and accessible park & ride lots
- ◆ Faster service via:
 - Signal prioritization
 - Queue jumper lanes
 - Dedicated bus lanes

The funding of the installation of 12 new bus shelters at various CAT bus stops is part of the MPO's ongoing effort to improve transit service in Collier County. In addition, CAT service improvements have been made through the purchase of buses to provide east/west connectivity within Collier and between Lee and Collier counties.

Park and Ride Facilities

Park and Ride facilities serve as a confluence and connector for people transferring to high occupancy vehicles, such as bus or rail transit, carpools and vanpools. By creating transfer locations for shifts from low occupancy to high occupancy travel, congestion can be measurably reduced especially along major freeway corridors (e.g., I-75). The Collier County Park and Ride Study was completed in 2005, and should be used as a reference to coordinate future planned park and ride facilities with the development of congestion management strategies and new projects and programs.

Bicycle/Pedestrian Improvements

These include improvements to the non-motorized modes of transportation such as bicycle lanes, trails, crosswalks and sidewalks, and are appropriate whenever shorter automobile trips can be readily diverted to foot or bicycle. They are appropriate for downtowns, major activity centers and built up areas in the County with a higher concentration of population, employment or students. They are more effective when connecting with or addressing a gap in a continuous bicycle or pedestrian network, but should be a priority for demonstrated bicycle or pedestrian safety hazards.

Bicycling can be improved by:

- ◆ Bicyclist/motorist awareness programs;
- ◆ Improving bicycle signage and pavement marking;
- ◆ Designated bicycle lanes;
- ◆ Separate dedicated bicycle trails or paths;
- ◆ Improved bicycle facilities (racks, lockers) at activity centers.

Walking improvements can be accomplished by:

- ◆ Assuring traffic signals work better for pedestrians;
- ◆ Installing countdown signals;
- ◆ Reducing crossing distances where possible;
- ◆ Maintaining sidewalks and crosswalks in good conditions;
- ◆ Continuing to maintain and expand street lighting; and
- ◆ Making sure proposed developments are pedestrian friendly.

Emphasis should also be placed on providing connectivity to the Regional Pathways Facilities as defined jointly by the Collier and Lee County MPO's. The currently adopted Collier-Lee Bi-County Regional Transportation Network displays the Regional Pathways facilities, and is contained in Appendix A-6. The Collier County Bicycle and Pedestrian System Map should also serve as a vital resource for the implementation of strategies and projects to improve bicycle/pedestrian facilities in the county.

Growth Management

Growth management strategies are designed to mitigate impacts that new development or redevelopment has on the transportation network, and to ensure that existing demand is being met, as well as to determine what else is needed to meet growing demand. State statutes, regional and local policies, ordinances, and development codes require that developers and land owners take into account peak hour trips and offset their impacts on the surrounding transportation network via:

- ◆ Right-of-Way dedication to create or fill in a grid of roads to disperse future trips;
- ◆ Contributions for on- and off-site improvements to roadway laneage, intersections, bus stops, sidewalks, and bikeways;
- ◆ Transportation impact fees to fund capacity or traffic operation improvements in the vicinity of the development;
- ◆ Concurrence prohibitions against new development in the absence of adequate infrastructure; and
- ◆ Site and urban design regulations such as:
 - Access controls
 - Setbacks
 - Mixed land uses enabling large developments to capture certain trips internally.

Overall, growth management strategies are most effective in areas with a high rate of development or redevelopment wherein adverse impacts can be forestalled, avoided or minimized. They would generally not be as effective in already developed areas with slower rates of growth.

4.1.2 Transportation System Management (TSM)

Transportation System Management is the application of construction, operational, and organizational programs to make the most productive and cost-effective use of the existing transportation network.

Intersection Improvements

Intersection improvement strategies include the addition or reconfiguration of turn lanes, realignment of intersecting streets, lane widening or improved channelization of acceleration or deceleration lanes, and providing better lane continuity. Such strategies generally result in improved capacity and traffic flow at an intersection, and the overall traffic flow of a corridor.

The reduction of bottlenecks at major intersections and highway interchange areas typically includes the following key strategies:

- ◆ Improve acceleration/deceleration lanes;
- ◆ Improve weaving sections;
- ◆ Improve lane and shoulder width;
- ◆ Install adequate signs and markings; and
- ◆ Install ramp metering.

Traffic Signal Improvements

Efficient signal timing can significantly reduce delay and improve travel times through major intersections within a transportation network. Signals can also be used to better accommodate bicyclists and pedestrian at intersections, and greatly improve their safety.

Adjustments to signal timing and phasing to reduce delay represent potentially one of the easiest solutions to implement, and therefore is one of the first considerations at the corridor level whenever signalized intersections are present. The following traffic signal improvements are typically provided by jurisdictions in Collier County:

- ◆ Traffic signal improvements
 - Signal equipment upgrades
 - Installation of pedestrian push-buttons
 - Timing and phasing
 - Signal optimization
 - Vehicle detection upgrade
 - Synchronization and Coordination
 - Advanced Traffic Management Systems (see ITS strategies)
- ◆ Signal management for special events
 - Timing and phasing for specific times
 - Allowing certain intersections to run uncoordinated when feasible

Special Events and Incident Management

Incident management includes programs to detect and respond to incidents, accidents and special events potentially impeding the flow of traffic. The use of ITS and other communications technology is often used to alleviate the problem and minimize congestion. For example, the FDOT District One I-75 Traffic Management Center provides incident management along the I-75 corridor in Collier County. The Road Ranger Dispatch Program also provides a fleet of service trucks patrolling the corridor to monitor incidents and clear disabled vehicles from travel lanes, remove roadway debris and assist the Florida Highway Patrol. Additionally, the MPO has participated in the Southwest Florida Traffic Incident Management Team (TIM). TIM members include state, regional and local transportation agencies, safety providers, emergency responders, and emergency management agencies. TIM is devoted to clearing roadway crashes in an efficient manner through the use of ITS, highway advisory radio, and dynamic message signs in order to provide the public with the most up to date information as possible.

4.1.3 Intelligent Transportation Systems (ITS)

ITS programs are an important component of the CMP. ITS is made up of a variety of communications and computer technologies focused on detecting and relieving congestion and improving safety within the transportation system by enabling drivers to make smart travel choices. ITS technology can communicate in real time to travelers where congestion is occurring and provide information on alternative routes or modes to reduce the severity and duration of congestion. It can also communicate where an accident has occurred, alerting officials to request assistance in clearing the accident and restoring traffic flow (see **Section 3.1.4**).

DRAFT

5.0 FUTURE CONDITIONS

The identification of future congested locations on the CMP network is an important part of the overall process for improving the operation and efficiency of the transportation system. The MPO's Travel Demand Model was utilized to identify congested/deficient conditions for the CMP network in the year 2035. The 2035 Model Network includes all existing (2009), committed (TIP) and planned (Needs Plan) improvements projects and forecasted volumes. The following section provides a forecast of conditions within the MPO's CMP network in 2035.

Table 5.1 shows the roadway segments forecasted to be deficient in 2035 if all improvements from the 2035 Needs Plan were in place. It is financially unconstrained and in this sense, the most expansive network envisioned. Given this assumption, these segments warrant attention in the CMP because no further expansion is planned further yet they will continue to be congested even under the most optimistic funding assumptions.

Table 5.1: Deficient Roadway Segments, 2035 Needs Plan

Road	From	To	Need Plan Lanes	Vol.	Adopted LOS Threshold	LOS
111th Avenue North	Gulfshore Drive	Vanderbilt Drive	2	10,800	7,904	F
Golden Gate Parkway	Livingston Road	I-75	6	56,300	55,300	F
Desoto Boulevard	I-75	Golden Gate Boulevard	2	7,300	6,084	E
Desoto Boulevard	Golden Gate Boulevard	Oil Well Road	2	10,000	6,084	F
Immokalee Road	Livingston Road	Strand Boulevard	6	54,900	48,200	F
Immokalee Road	Oakes Boulevard	Logan Boulevard	6	50,800	48,200	F
Immokalee Road	Collier Boulevard	Driveway Access	6	53,200	51,000	F
Pine Ridge Road	Livingston Road	Whippoorwill Lane	6	53,800	53,100	F
Pine Ridge Road	Whippoorwill Lane	I-75	6	55,400	48,200	F
Tamiami Trail East / US 41	Goodlette-Frank Road	Davis Boulevard	8	87,200	70,900	F
Tamiami Trail East / US 41	Airport Pulling Road	North of Palm Drive	6	59,000	53,100	F
Tamiami Trail East / US 41	North of Palm Drive	Rattlesnake Hammock Road	6	61,800	55,300	F
Thomasson Drive	Bayshore Drive	Tamiami Trail / US 41	2	8,900	8,008	F
Vanderbilt Beach Road	Gulfshore Drive	Vanderbilt Drive	2	14,100	5,460	F
Vanderbilt Beach Road	Vanderbilt Drive	Tamiami Trail / US 41	2	14,500	14,040	D

Figure 5.1 shows the CMP Corridor segments forecasted to be deficient under the 2035 Needs Plan scenario.

Once cost feasible capacity improvements are known, the list of deficient segments should be updated because it is expected that funding will not be available to address all capacity needs, and more deficient segments are anticipated.

DRAFT

Figure 5.1 Deficient CMP Corridors, 2035 Needs Plan

DRAFT

6.0 FUTURE CMP STRATEGIES

6.1 Recommended CMP Strategies

The following provides additional strategies which the MPO should further expand upon or incorporate into the current CMP menu of strategy options. These additional strategies are based in part on the goals and objectives of the 2035 LRTP, and may be applied to future CMP projects or programs.

Travel Demand Management (TDM)

- ◆ HOV/HOT Lanes
- ◆ Parking Management
- ◆ Variable Pricing
- ◆ Freight and Goods Movement
- ◆ Transit Access

Travel System Management (TSM)

- ◆ Access Management
- ◆ Ramp Metering
- ◆ Roadway Signage

Intelligent Transportation System (ITS)

- ◆ Advanced Traffic Management System (ATMS)
- ◆ Incident Management and Safety

6.1.1 Travel Demand Management

HOV/HOT Lanes

High Occupancy Vehicle (HOV) lanes serve to reduce congestion on freeways (e.g., I-75) by encouraging ridesharing and transit. Transit buses or vehicles with two or more passengers are permitted to use HOV lanes. In response to underutilization of HOV lanes and/or funding shortfalls, High Occupancy Toll (HOT) lanes have also been implemented across many major metropolitan areas of the United States. HOT lanes allow any transit bus or vehicles with two or more passengers to use the lane(s), and additionally permit single occupant vehicles (SOV) to utilize the lane(s) at a price. The toll is typically a variable rate based on time of day and/or location.

Parking Management

Parking management strategies are implemented to reduce the availability of free parking in specific locations, especially in areas served by congested corridors. Parking management may consist of area-wide policies or be specific to a particular site. Policies typically include reducing the minimum or maximum number of spaces required per facility or employee; raising parking fees for employees and visitors; metered

parking; providing cash-out options for employees not using subsidized parking; and expanding parking at major bus stations and park-and-ride lots. Additionally, on-street parking requirements can also be adjusted to better serve transit, mixed land uses and pedestrian-oriented activity centers. Currently in Collier County, parking management strategies would apply to major activity centers such as metered parking at area beaches and downtown Naples.

Variable Pricing

Variable pricing refers to charging different toll rates based on the time of day or level of congestion on a specified segment of a freeway, major arterial or bridge. Variable pricing may also apply to HOT lanes. The intent of variable pricing is to promote a more efficient use of highways/freeways and congestion reduction with a defined area (e.g., downtown area) by changing driver behavior and usage of a facility to extend beyond peak periods of the day.

Freight and Goods Movement

Due to mobility and acceleration factors, freight trucks often have a significant negative effect on roadway congestion, especially near interstate ramps and interchanges. At the same time, trucks can be adversely affected by congestion caused by other vehicles. By understanding the movement of freight within the CMP network, the MPO can better understand roadway congestion in Collier County.

Specific freight strategies to mitigate congestion on major truck routes may involve a variety of strategies, many of which overlap to directly impact operational strategies for single occupant vehicles. Examples include:

- ◆ *Designated Truck Routes:* Develop and/or adopt a countywide truck route map/network, and include proper signage.
- ◆ *Truck Traffic Diversion:* Diversion of freight and truck traffic to newly designated routes, by-passes, or to rail.
- ◆ *Truck Lane Restrictions:* Propose truck lane restrictions on major arterials/interstate.
- ◆ *Grade Crossings:* Develop and implement highway/railway crossing improvements.
- ◆ *Freight Design Standards:* Develop and adopt countywide design standards to facilitate improved truck flow (e.g., operations, geometry, turning radii, striping, curb placement)
- ◆ *Freight Delivery Schedule:* Work with freight industry to potentially change freight delivery times during peak travel periods, especially near major activity centers (e.g., downtowns).
- ◆ *Freight-Oriented Improvements:* Implement geometric improvements at intersections and interchanges along major truck routes.

These strategies are appropriate to use at the Corridor-Specific level, but may also be applied to a System-Wide level to understand the interrelationship between the CMP network and the regional freight network.

Transit Access

The improvement of access to transit for a larger share of the population in Collier County is a cost-feasible strategy to reduce congestion, and increase ridership. Programs focused on maintaining and optimizing accessibility to the existing CAT route include:

- ◆ Improved or modified bicycle and pedestrian accessibility and connections to bus stops include:
 - Sidewalks
 - Crosswalks
 - Curb cuts and ramps (ADA compliant)
 - Landing pads for wheelchairs, scooters, and walkers
 - Bus shelters
 - Bicycle storage/racks

6.1.2 Travel System Management (TSM)

Access Management

Access management is the process for managing how major roadways impact through-traffic and provide access to property and land development. Policies and design criteria may be implemented to minimize the number of driveways and intersecting roads accessing a major roadway, including parallel service roads, shared driveways, median barriers, and curb cut limitations. This strategy can result in reduced crashes, higher vehicle speeds, and improved LOS. Access management strategies include:

- ◆ Construct raised median barriers near major intersections
- ◆ Construct parallel access/frontage roads
- ◆ Implement driveway turn restrictions (right-in, right-out channelization)
- ◆ Restrict access using driveway closures, consolidations
- ◆ Restrict cross-median access near intersections

Ramp Metering

Ramp metering typically consists of a two-section traffic signal (red, green) which regulates the flow of traffic entering the freeway (e.g., I-75) based on current traffic conditions. Ramp meters alleviate congestion on freeways by reducing the demand and spacing the flow of vehicles entering the facility. The metering rate of signals can be set to optimize freeway flow and minimize congestion. The metering rate can be fixed, or responsive to local or system-wide conditions. Ramp metering is currently not being implemented in Collier County. However, benefits realized from a ramp metering program typically include:

- ◆ Travel time savings
- ◆ Improved safety at interchanges and along freeway
- ◆ Effective use of freeway capacity
- ◆ Reduced travel time variability

Roadway Signage

The improvement or addition of signage along congested corridors of the CMP network can improve visibility issues, reduce uncertainty and confusion, and minimize indecision and delays that occur along major roadways, especially during peak periods. Examples of improving roadway signage include the implementation of more visible and larger signage providing better route finding and directions. Locations to implement improved signage include major intersections, off-ramps on freeways (e.g., I-75), locations with tourists (beaches), and activity centers (downtowns).

6.1.3 Intelligent Transportation System (ITS)

Advanced Traffic Management System (ATMS)

Efficient traffic signal management can reduce congestion and improve travel times for motorists, truckers, buses and emergency vehicles. Future CMP projects and programs should further incorporate the use of all existing and planned build-out of the County's ATMS, such as traffic signal coordination, signal synchronization, video monitoring, dynamic message signs, SCOOT and incident response. The further incorporation of ATMS will contribute to a reduction in travel time delays, vehicle miles and hours of travel and overall congestion on the transportation system.

Incident Management and Safety

Crashes occurring along roadway intersections and segments are frequently indicators of congestion, driveway/access management, aggressive/speeding drivers, stop-and-go traffic, driver confusion and geometric deficiencies. From a congestion management standpoint, there are a number of strategies that the MPO and its partners should continue to pursue including:

- ◆ Improve the coordination of emergency response at the state, regional and local levels (e.g., utilizing GPS information);
- ◆ Coordinate the integration and expansion of Traffic Management Centers;
- ◆ Promote the continued expansion and coordination of the multi-jurisdictional ATMS; and
- ◆ Ensure the integration of all ongoing and planned ITS initiatives into the CMP.

6.2 CMP Strategy Toolbox

The approach to implementing CMP strategies should be examined at both the system-wide and corridor-specific levels. Depending on the specific issues or problems that may exist within the CMP network, it is highly beneficial to utilize a "toolbox" approach, which includes a detailed description of various strategies within a specific congestion management category (e.g. travel demand management). This approach will further assist the CMS/ITS Committee and MPO with evaluating and determining the best strategy to implement for a specific project or program. The "toolbox" could be published as a stand-alone CMP document or incorporated in the next CMP document update. Some examples are provided below (click to view documents online).

- ◆ [Mid-America Regional Council](#)
- ◆ [Wichita Area Metropolitan Planning Organization](#)

- ◆ Denver Regional Council of Governments
- ◆ Nashville Area Metropolitan Planning Organization
- ◆ Kentucky Transportation Cabinet

6.3 Evaluation and Performance of CMP Strategies

Monitoring the effectiveness of CMP strategies on the transportation system, and specific corridors is a key MPO role. An assessment of the efficiency and effectiveness of implemented strategies will take place concurrently with the development or update of the LRTP. The assessment will involve the system-wide CMP network as well as individual corridor studies. Evaluating the CMP simultaneously with the LRTP enables decision-makers, and the public, the opportunity to select the most effective strategies or projects for future implementation. The results also provide feedback that will allow the MPO to make necessary changes or modifications to the CMP.

6.4 Feedback and Modification of CMP Strategies and Projects

As CMP strategies are implemented and evaluated on a regular basis, the MPO may find it appropriate make adjustments. In some cases, it may also be necessary to add new strategies to enable the CMP to become more effective. Any feedback and modifications to the CMP will be coordinated with the CMS/ITS Committee. Proposed changes will be reviewed by the appropriate committees (CAC, TAC and PAC) and ultimately by the MPO Board for final review and approval. In general, formal modifications will occur during the periodic update to the CMP document.

The evaluation of CMP projects after their initial implementation will also be completed by each sponsoring agency, as required by the MPO's CMP Project Submission Application/Checklist. The results will enable the MPO and committees to provide feedback to ensure that the CMP is utilizing the most effective strategies.

7.0 RECOMMENDATIONS

The following section provides a set of recommendations to be used as a guide in developing and updating the CMP as part of the long-range transportation planning process. The recommendations focus on three areas:

- ◆ Performance Measures
- ◆ **CMP Projects & Implementation Process**
- ◆ CMP Reporting Process

7.1 Performance Measures

Performance measures define how effectively and efficiently the transportation system is operating. Generally speaking, they indicate the difference between optimal free flow travel and congested conditions. Performance measures are developed to quantify levels of congestion, and to provide an analytical approach in determining congestion trends.

7.1.1 Existing CMP Performance Measures

The MPO uses two system-wide performance measures to evaluate changes on an aggregated basis to the entire CMP transportation system over time and determine whether implemented improvement strategies are achieving desired objectives. The following CMP measures include:

- ◆ **Level of Service (LOS):** The level of service (LOS) of a CMP roadway segment is calculated using service volume tables in the AUIR and municipal comprehensive plans. Traffic volumes exceeding the concurrency LOS for a roadway segment are considered potentially congested.
- ◆ **Volume to Standard Ratio:** The ratio of the traffic volume of the CMP roadway is compared to the maximum service volume at the LOS standard (volume to standard ratio). Roadway segments that exceed the volume to standard ratio of 0.80 and are projected to fail within five years are considered potentially congested.

7.1.2 Future CMP Performance Measures

One main purpose of the CMP is to track conditions consistently over time; however, the MPO's CMP performance measures will need be refined as technology and experience or current practice allow new data to be considered. Also, the re-authorization of SAFETEA-LU is considering a requirement that all MPOs must develop a Metropolitan Mobility Plan. The Plan will likely address congestion and its impacts within the MPO area to an even great extent than previous congestion management requirements. The Plan will also likely place a major emphasis on the following key performance measures:

- ◆ Annual hours of travel delay (daily, peak periods)
- ◆ Annual costs of congestion
- ◆ Freight and goods movement accessibility

- ◆ Incident-based delays
- ◆ Economic development and jobs
- ◆ Safety (injury and fatal crashes)
- ◆ Environmental sustainability (air quality, quality of life)
- ◆ Single occupant vehicle (SOV) mode share
- ◆ Rideshare (carpool, vanpool, HOV)
- ◆ Bicycle/Pedestrian facility mileage
- ◆ Public transportation usage, route mileage and access

7.1.3 Recommended Performance Measures

In order to meet current and future federal regulations, it is recommended that a comprehensive set of system-wide multimodal performance measures be used. This will also ensure that implemented improvement strategies are achieving desired objectives. The MPO should incorporate the following additional system-wide multimodal performance measures to evaluate changes on an aggregated basis for the entire CMP transportation system over time and determine whether implemented improvement strategies are achieving desired objectives. These recommendations are based on existing data and information available to the MPO, and are reflective of the 2035 LRTP goals and objectives. Data sources are listed in parenthesis.

- ◆ **Vehicle Miles Traveled (VMT):** The vehicle utilization on the defined roadway segments of the CMP network (GIS, Model Output).
- ◆ **VMT by Roadway Level of Service (LOS):** The vehicle utilization on the defined roadway segments of the CMP network with different levels of congestion (LOS A to LOS F) (GIS, Model Output).
- ◆ **Traffic Crashes:** The total number of crashes on the defined CMP network, including both injuries and fatalities (Crash Database). This may also include identifying the top 20 to top 50 locations where further safety programs and CMP strategies can be implemented.
- ◆ **Traffic Crashes Per 100 Million VMT:** The total number of crashes on the defined CMP network (includes injuries and fatalities) per 100 million VMT (Crash Database, Model Output, Traffic Count Data).
- ◆ **Bicycle Facilities:** The total length in miles of existing on-road bicycle facilities (bicycle lanes, shoulders) on the defined CMP network (GIS).
- ◆ **Pedestrian Facilities:** The total length in miles of existing sidewalk facilities on the defined CMP network (GIS).
- ◆ **Bicycle Crashes:** The total number of bicycle crashes on the defined CMP network, including both injuries and fatalities (Crash Database).

- ◆ **Pedestrian Crashes:** The total number of pedestrian crashes on the defined CMP network, including both injuries and fatalities (Crash Database).
- ◆ **Transit Route Network:** The total CAT fixed route transit service coverage by length in miles within the defined CMP network (GIS).
- ◆ **Population Served by Transit:** The percentage of the CMP area population located within ¼ mile of CAT fixed route transit service (GIS).
- ◆ **Transit Ridership:** The average weekday and total annual passenger trips by fixed transit route within the CAT system (CAT Database, Model Output).
- ◆ **Number of Registered Carpoolers/Vanpoolers:** The total number of registered carpool and vanpool participants of the FDOT District One Commuter Services program in Collier County (District One Database).

The following potential performance measures should also be considered by the MPO for future CMP updates to be consistent with the 2035 LRTP goals and objectives and impending federal requirements. These performance measures will likely require additional data collection and/or analysis by the MPO and its member agencies and partners.

Freight and Goods Movement

Future CMP reports should focus on the conditions affecting the movement of goods across Collier County's major transportation facilities (freeways, arterials, major interchanges/intersections). Performance measures for freight and goods movement should be added to evaluate conditions and strategies to manage congestion. Analyzing the impacts of freight on congestion, and vice versa, is integral to the CMP program.

Potential performance measures may include:

- ◆ Weighted V/C on identified Major Truck Routes;
- ◆ Percent of VMT on congested Major Roads identified as Major Truck Routes; and
- ◆ Number of railcars, tonnage, or truck equivalents moved by rail.

Delay and Reliability

The time required to get from an origin to a destination, or the delay encountered while doing so, is the measure that is perhaps most meaningful to the traveling public. Measures of delay and reliability (e.g., predictable travel times) may include:

- ◆ Travel time versus free flow conditions or posted speed limits (Travel Time Index);
- ◆ Intersection delays (corridor-specific measure);
- ◆ Vehicle queues (corridor-specific measure);
- ◆ Operating speeds (corridor-specific measure).

The source for travel time measures may include travel logs, GPS equipped “probe vehicles”, and/or archived ITS data for specific facilities equipped with detection devices. The other measures may be derived from before and after field surveys conducted for corridor studies or corridor traffic simulation models.

Duration of Congestion

Congestion generally refers to the volume of traffic that exceeds adopted level of Service (LOS) standards. Congestion that occurs intermittently or only during particular periods does not require the same level of attention or remedies as congestion that occurs over sustained periods (e.g., more than two consecutive hours). Therefore, tracking the duration of congestion is important to ensure that locations with the most long-lasting congestion receive a higher priority. Duration is a corridor-specific measure that can be tracked via traffic counts taken at hourly or 15 minute intervals.

Economic Costs Congestion

The economic costs of congestion to an MPO typically are not accounted for in the CMP. However, the costs associated with congestion in metropolitan areas is an important performance measure to track over time. Monitoring the economic costs of congestion involves a summation of every hour of travel delay during a specified year, multiplied by an hourly cost. The hourly cost is determined by taking the average hourly wage of a working-age driver in motor vehicle or bus and a truck driver in a truck or other delivery service vehicle, and multiplying that rate by total hours of travel delay.

$$\text{Economic Costs of Congestion(\$)} = [(AHR \text{ Drivers} + AHR \text{ Truck Drivers})/2] * AHD$$

AHR = Average Hourly Rate
AHD = Annual Hours Delay

The Texas Transportation Institute (TTI), an arm of Texas A&M University, produces an annual report entitled the Urban Mobility Report ([2009 Urban Mobility Report](#)). This report estimates congestion problems in metropolitan areas of the nation, and provides an overall assessment of long-term congestion trends. The information is based upon defined performance measures applied to each metropolitan area. The report serves as an excellent model to follow, however, currently does not include data and information for Collier County.

The information derived from the Mobility Report serves as a valuable source of information for developing the CMP and in monitoring congestion impacts at the MPO level over time. Importantly, however, even the Mobility Report does not take all costs into account. According to the FHWA, these published estimates likely account for less than half of the overall costs of transportation congestion. Additional costs include the following:

- ◆ Loss of productivity due to the economic consequences and smaller labor pools resulting from commuting time/costs;
- ◆ Safety costs;
- ◆ Vehicle wear and tear;

- ◆ Inventory costs of larger stocks required by congestion-related unreliability in shipment times; and
- ◆ Costs to passengers of leaving early for a destination because of congestion-related unreliability in travel times.

(Source: FHWA: *Public Roads*, July/August 2007, Vol. 71, No. 1)

7.1.4 Data Sources

The decision to utilize certain performance measures has implications on the MPO and member government data collection efforts. Data collection can be a major expense in the Congestion Management Process. The MPO typically serves as the repository of data to support the CMP, and relies upon FDOT, Collier County, CAT, and the Cities of Naples, Marco Island and Everglades City. Therefore, the MPO will continue to rely on data sources such as the Annual Update Inventory Report (AUIR), traffic and concurrency data and information from the cities of Naples and Marco Island, and multimodal data related to transit and bicycle/pedestrian facilities. As additional performance measures are adopted, The MPO and CMS/ITS Stakeholders Committee will need to work in partnership with all member agencies to obtain the necessary data and information.

A data acquisition plan should also be utilized by the MPO to guide future CMP data collection. The use of a data plan or chart will ensure that all necessary information is routinely and consistently collected for CMP System Performance Reports and corridor studies. Appendix C-1 contains a sample data acquisition plan to use as guidance.

7.2 Candidate CMP Projects and Implementation

Candidate CMP projects should be drawn from:

- **Deficient CMP corridor segments** identified as deficient now or in the future, and for which no major capacity project is planned, or may have a planned capacity project that will not be implemented until the out years of the LRTP and needs more immediate attention;
- **Safety projects** that address high crash locations or populations most vulnerable to crashes;
- **Critical Need Intersections**, including the following:
 - Immokalee Road and Tamiami Trail East (US 41)
 - Immokalee Road and Livingston Road
 - Immokalee Road and Collier Boulevard
 - Immokalee Road and Randall Boulevard
 - Pine Ridge Road and Airport-Pulling Road
 - Pine Ridge Road and Livingston Road
 - Interstate 75 (I-75) and Collier Boulevard (CR 951)
 - Interstate 75 (I-75) and Everglades Boulevard
 - US 41 and SR 29
 - Tamiami Trail East (US41) and Collier Boulevard (CR 951)
 - Davis Boulevard and Airport Pulling Road

- Golden Gate Parkway and Livingston Road
- US 41 and Golden Gate Parkway

To implement CMP corridor projects, a more detailed corridor analysis is generally recommended to pinpoint the exact nature of the problem, including the extent, duration and root causes contributing to congestion. Performance objectives and strategies geared to these causes and objectives can then be formulated, along with their costs, funding and implementation milestones.

Detailed cost estimates of any potential action are project-specific, therefore a general range is provided for each type of project or safety countermeasure. In several cases, relative cost ranges are not provided, such as for some educational and enforcement programs.

To be provided:

- COST ESTIMATES/FUNDING RANGES FOR PROJECT / STRATEGY TYPES
- APPLIED AS PACKAGED IMPROVEMENTS BASED ON LOCATION, FACILITY TYPE, INTERSECTIONS, SEGMENTS, AND MAY INCLUDE:
 - intersection improvements (add/extend turn lanes)
 - intersection improvements (stop light)
 - bus benches, shelters
 - bus stop improvements/access
 - bicycle lanes, sidewalks, bike path links
 - signal timing, upgrades
 - TDM, parking management, etc.
 - ramp metering, bus/HOV
 - New transit service, route extension, etc.
- BASED ON CURRENT AND RECOMMENDED TOOLBOX OF STRATEGIES

7.3 CMP Reporting Process

7.3.1 CMP Update Cycle

The CMP should be updated on a five-year cycle to coincide with the development of the LRTP. As CMP-related improvements are implemented, their impacts on congestion will be reviewed and accounted for in the MPO's planning process and by the ITS/CMP Committee. The following provides a summary of guidelines for the implementation and management of the CMP.

7.3.2 Congestion Management Process Performance Report

On an annual basis, the MPO should provide a summary of accomplishments related to congestion management to all constituent committees, the Board and the public. The summary report would describe all progress related to CMP-related projects and

programs, such as bicycle/pedestrian improvements, transit route/service improvements, and TSM/ITS improvements. Capacity projects with CMP components should also be monitored and included in the summary report. Coordination should take place with member agencies responsible for implementing CMP strategies and projects. A separate form could be developed by the MPO to use for tracking purposes.

Overall, an implementation report is meant to provide the state of the CMP system, benefits realized and status of on-going efforts. On an annual basis, the CMS/ITS Stakeholders Committee should recommend revising the process as needed to ensure that it functions efficiently and effectively, especially as it relates to the proposed changes at the Federal level. Additionally, the MPO should publish an annual Congestion Management Process Performance Report at the close of each federal fiscal year. This report includes:

- ◆ A description of the CMP;
- ◆ A description and explanation of funded CMS/ITS Box projects for the past fiscal year;
- ◆ An assessment on the performance of implemented projects;
- ◆ A description of project implementation;
- ◆ An evaluation of project effectiveness; and
- ◆ An outline of CMS/ITS Stakeholder Committee recommendations for improvements to the process.

DRAFT