AGENDA
CMC
Congestion Management Committee
NOTE: THIS IS AN IN-PERSON MEETING

Collier County Growth Management Department
Construction and Maintenance Building
South Conference Room
2885 South Horseshoe Drive
Naples, Florida 34104

January 19, 2022
2:00 p.m.

1. **Call to Order**
2. **Roll Call**
3. **Approval of Agenda**
4. **Approval of September 15, 2021 Meeting Minutes**
5. **Open to Public for Comment on Items Not on the Agenda**
6. **Agency Updates**
   A. FDOT
   B. MPO Director
   C. Other
7. **Committee Action**
   A. Elect Chair & Vice Chair
   B. Endorse 2022 Congestion Management Process Update
   C. Endorse Congested Corridors Evaluation Methodology
8. **Reports and Presentations (May Require Committee Action)**
   A. CAT - Transit Signal Priority & Automatic Vehicle Location system update
   B. FDOT – US 41 FRAME Presentation
9. **Member Comments**
10. **Distribution Items (No presentation)**
11. **Next Meeting Date:**

    March 16, 2022 at 2 p.m.
12. **Adjournment**

PLEASE NOTE:
The meetings of the advisory committees of the Collier Metropolitan Planning Organization (MPO) are open to the public and citizen input is encouraged. Any person wishing to speak on any scheduled item may do so upon recognition of the Chairperson. Any person desiring to have an item placed on the agenda should contact the MPO Director at least 14 days prior to the meeting date. Any person who decides to appeal a decision of the advisory committee will need a record of the proceedings pertaining thereto, and therefore may need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence upon which the appeal is to be based. In accordance with the Americans with Disabilities Act, any person requiring special accommodations to participate in this meeting should contact the Collier Metropolitan Planning Organization 72 hours prior to the meeting by calling (239) 252-5814. The MPO's planning process is conducted in accordance with Title VI of the Civil Rights Act of 1964 and Related Statutes. Any person or beneficiary who believes that within the MPO's planning process they have been discriminated against because of race, color, religion, sex, age, national origin, disability, or familial status may file a complaint with the Collier MPO Title VI Specialist Ms. Danielle Bates (239) 252-5814 or by email at: Danielle.Bates@colliercountyfl.gov, or in writing to the Collier MPO, attention: Ms. Bates, at 2885 South Horseshoe Dr., Naples, FL 34104.

CONGESTION MANAGEMENT COMMITTEE of the
COLLIER METROPOLITAN PLANNING ORGANIZATION
VIRTUAL AND IN-PERSON HYBRID MEETING
ZOOM MEETING PLATFORM

September 15, 2021
2:00 p.m.
Meeting Minutes

1. Call to Order

Mr. Khawaja called the meeting to order at 2:05 p.m.

2. Roll Call

Ms. McLaughlin called the roll and confirmed a quorum was present in the room.

CMC Members Present In-Person
Tony Khawaja, Chairman, Collier County Traffic Operations
Omar DeLeon, County Public Transportation & Neighborhood Enhancement (PTNE)
Karen Homiak, CAC Representative
Lorraine Lantz, County Transportation Planning
Don Scott, Lee MPO (arrived during agency updates)

CMC Members Absent
Don Scott, Lee County MPO
Dave Rivera, City of Naples
Allison Bickett, City of Naples
Dan Summers, County Emergency Management
John Kasten, Collier County Public Schools
Tim Pinter, City of Marco Island

MPO Staff
Anne McLaughlin, Executive Director
Brandy Otero, Principal Planner
Scott Philips, Principal Planner
Danielle Bates, Administrative Assistant

Others Present
Victoria Peters, FDOT (arrived during agency updates)
Christopher Ordonez, Collier County Traffic Ops
Wally Blain, Tindale-Oliver & Associates, Inc (virtually)
Nick Spatola, Faller, Davis & Associates, Inc (virtually)
Alex Showalter, County PTNE Division

Mr. Khawaja introduced Christopher Ordonez, Project Manager.
Ms. McLaughlin introduced Scott Philips, MPO Principal Planner and Danielle Bates, Administrative Assistant.

3. Approval of the Agenda

Mr. DeLeon *moved to approve the agenda.* ***Ms. Lantz*** *seconded. Carried unanimously.*

4. Approval of the March 17, 2021 Meeting Minutes.

Ms. Homiak *moved to approve the March 17, 2021 minutes.* ***Mr. DeLeon*** *seconded. Carried unanimously.*

5. Public Comments for Items not on the Agenda

None.

6. Agency Updates

A. FDOT

Ms. Peters – New Draft Tentative Work Program - Department will hold public hearings week of October 18-22 on new Draft Tentative Work Program FY23-FY27; Will hold virtual and in-person meeting with opportunity to provide comments at Southwest Area Office (SWAO) /SWIFT Center SunGuide Building behind the Daniels rest area, Tuesday, October 19th, from 10-12 noon. Call it the SWIFT building when talking to the public, that's easier to find on Maps/Google. October 29th will likely be the last date for public comments. Will try to get info out as soon as allowed.

B. MPO Executive Director

Ms. McLaughlin – nothing other than what is included in the agenda.

C. Other Agencies

Mr. De Leon: Introduced Alex Showalter, the new Senior Planner for Collier Area Transit (CAT).

Mr. Ordonez: Will provide an update on 37 intersections, all connected, later in the agenda.

7. Committee Action

A. Endorse Scope of Services for Congestion Management Process Update

Ms. Otero: Due to reduction in driving during the COVID-19 pandemic, staff determined that developing another Biennial Transportation System Performance Report (TSPR) as called for in the UPWP would be counterproductive. The 2017 Congestion Management Process (CMP) needs to be updated to incorporate recommendations from the 2020 TSPR. Revised previously reviewed Scope to include a County-wide Origin/Destination study. Information will be helpful when developing the 2050 LRTP. Requesting comments and revisions from committee. Up to $150,000 available in 2021/2022 planning funds. Wally Blain is available to answer questions.

Mr. Blain: Additional information on origin/destination study provided in revised handout; refer to Task 4. Need a better understanding of traffic flow to improve on recommendations for CMP and how to tie into TSPR's action steps. The key is in the documentation step. During analysis for baseline conditions, identified congested corridors and placed the corridors in priority tiers based on various factors. This project will take deeper dive into what the issues are and travel characteristics behind them. Intent is to develop fact sheets for corridors, informative to general public to identify current operations and programmed actions to relieve congestion. Will also identify strategies that could further alleviate congestion as committee works through project prioritization process. Task 4 should wrap up by end of fiscal year. New Task 5 provides list of expected agenda topics for committee meetings between November and May, project timeline and key deliverables.

Mr. Khawaja, Ms. Otero, Mr. Blaine: conversation on short time frame to complete project due to funding timeline, desire to alleviate potential conflicts with contracts/de-obligation, etc.

All: conversation on specific corridors to be studied; number based on funding. Corridors identified in the TSPR. Tier 1 and Tier 2 comprised 15 corridors. Additional corridors were considered from Tier 3. The intention was to review the corridors, then identify the top 10. **Mr. Khawaja** wants the 8 and 8 major arterials (North/South/East/West) covered. Working with Lee County too, so it will include a regional element.

Mr. Khawaja: Wants scope to include 8 and 8 arterials, will endorse with inclusion.

Mr. DeLeon *moved to endorse Scope of Services for Congestion Management Process Update with modification.* ***Ms. Lantz*** *seconded. Carried unanimously.*

8. Reports and Presentations (May Require Committee Action)

A. Collier County Retiming Project

Mr. Ordonez: Introduced Nick Spatola, Faller, Davis & Associates, consultant.

Mr. Khawaja: Committee provided money for retiming project. Thought committee would benefit from seeing results, understanding what a typical retiming project entails, so when authorizing future projects, we know what's required.

Mr. Spatola: Presented an overview of Collier County's Traffic Signal Timing and Coordination project. Project incorporated 4 major arterials: Airport Road, Pine Ridge Road, Livingston Road, and Vanderbilt Beach Road. His presentation can be viewed here: Traffic Signal Timing and Coordination.

Mr. Scott, Mr. Spatola, and Mr. Khawaja: Conversation on signals that skip a direction in the cycle, seen other places in Florida, don't have any examples in Collier County; service all directions every cycle if there is demand; do have signals that reservice some directions, may be lead-lag system looking like it's skipped.

Mr. Scott: Doing any timing projects on state roads?

Mr. Khawaja: We have a project programmed on US 41 that was funded by this committee, but state has agreed to complete it under their contract.

Mr. Khawaja: The numbers are huge, 107 times more over the investment, you don't get that return often. It's not invasive, it saves individual citizen a small amount of gas, but collectively it's a large savings. Good to put number on the saving.

Ms. McLaughlin: Appreciate having this data, MPO has to demonstrate that funded projects have an impact on congestion. Will include this success story in MPO's Annual Report; and consider having consultant give presentation to the board.

Ms. Lantz: As a committee, need to see results of projects being prioritized.

Ms. McLaughlin: All of the performance measures say we need hard data.

Mr. Khawaja: Final report is about to be approved, ready to provide.

Ms. McLaughlin: The data collected as part of the CMP update will help with regional coordination with Lee County.

9. Member Comments

None.

10. Topics for Next Meeting

Mr. De Leon: CAT project is out for solicitation. Project incorporates transit signal priority and upgrading or replacing CAT Automatic Vehicle Location (AVL) system, looking at how to integrate modes together to facilitate movement.

Ms. Peters: FDOT will present Florida's Regional Advanced Mobility Elements (FRAME) project to Lee County next month. Would be good to see if a presentation can be given here as well. Will provide presentation to committee when available.

11. Distribution Items

Ms. Otero: One change on the 2022 Calendar: MPO Board joint meeting is moved from Oct 2021 to Feb 2022.

Ms. McLaughlin: Might have two joint meetings in 2022, not sure what our schedule will be, bump meetings to winter from fall, haven't discussed it with Lee MPO yet.

Mr. Scott: October might not work; Work Program comes out around that time.

12. Next Meeting Date

November 17, 2020 – 2:00 p.m.

13. Adjournment

There being no further comments or business to discuss, Mr. Khawaja adjourned the meeting at 3:04 p.m.

EXECUTIVE SUMMARY
COMMITTEE ACTION
ITEM 7A

Elect Chair and Vice-Chair

OBJECTIVE: For the Committee to elect a Chair and Vice-Chair for calendar year 2022.

CONSIDERATIONS: The CMC by-laws require that the Committee elect a Chair and Vice-Chair at the first regularly scheduled meeting of each year when a quorum is attained.

Any committee member may nominate or be nominated as Chair/Vice-Chair. Elections shall be decided by the majority vote of committee members present. The Chair and Vice-Chair shall serve a one-year term or until a successor is elected. Anthony Khawaja is the current Chair; Tim Pinter is the current Vice-Chair.

STAFF RECOMMENDATION: That the Committee elect a Chair and Vice-Chair for calendar year 2022.

Prepared By: Scott Philips, Principal Planner Collier MPO

EXECUTIVE SUMMARY
COMMITTEE ACTION
ITEM 7B

2022 Congestion Management Process Update

OBJECTIVE: For the committee to receive an update on the consultant's progress and provide comments on the 2022 CMP Update with a recommendation of approval to the MPO Board.

CONSIDERATIONS: The first Biennial Transportation System Performance (TSP) Report was approved by the MPO Board in September 2020 as called for in the MPO's Congestion Management Process (CMP). Recommendations of the TSP Action Plan included updating the CMP to address new sources of data for evaluating travel speeds, reliability and congestion bottlenecks, and to establish a consistent methodology for identifying congested locations based on a performance driven approach. The TSP Action Plan also called for updates to the MPO's 2017 CMP Goals, Objectives, and Performance Measures to be consistent with the analysis included in the Baseline Conditions Report.

The MPO Board approved the consultant scope of services to update the CMP at their November 2022 meeting. The consultant will provide the CMC with an overview of the changes that have been included in the Draft 2022 CMP Update, provided as **Attachment 1**. The 2022 CMP Update provides an overview of the process followed by the MPO, guidelines for measuring current congested conditions, and developing effective congestion reduction strategies based on the CMP Objectives and Performance Measures. A copy of the consultant's presentation has been included as **Attachment 2.**

STAFF RECOMMENDATION: Endorse the 2022 CMP Update and recommend MPO Board approval based on review and discussion by the CMC.

Prepared By: Brandy Otero, Collier MPO Principal Planner

ATTACHMENT(S):

1. 2022 CMP Update
2. Consultant Presentation

Congestion Management Process

2022 Update

Adopted by the Collier MPO on Month XX, 2022

This document was prepared by the Collier Metropolitan Planning Organization (MPO) in Collier County, Florida in collaboration with the Florida Department of Transportation and the advisory committees of the MPO.

The preparation of this document has been financed in part through grants from the Federal Highway Administration, U.S. Department of Transportation under the Metropolitan Planning Program, Section 104(f) of Title 23, U.S. Code. The contents of this document do not necessarily reflect the official views of the policy of the U.S. Department of Transportation.

Collier MPO Mission

Provide transportation planning leadership through a collaborative effort to maintain a safe, efficient, integrated, and multi-modal transportation system.

Collier MPO Vision

The MPO strives to provide a fully integrated and multi-modal transportation system that safely and efficiently moves people and goods while promoting economic development and protecting natural and man-made regional assets.

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1.0 Introduction

The Congestion Management Process (CMP) is a data-driven and systematic approach conducted by Metropolitan Planning Organizations (MPOs) to improve traffic operations and safety by identifying strategies that reduce travel demand or implement operational efficiencies. The Collier MPO is required by the federal government to implement a CMP as part of its routine planning efforts. The public benefits from having a functional CMP that results in low-cost improvements or strategies being implemented in a relatively short timeframe (5–10 years). Projects identified through the CMP are coordinated with the Long Range Transportation Plan (LRTP) in terms of identifying future revenue commitments and establishing consistency in the MPO's planning process.

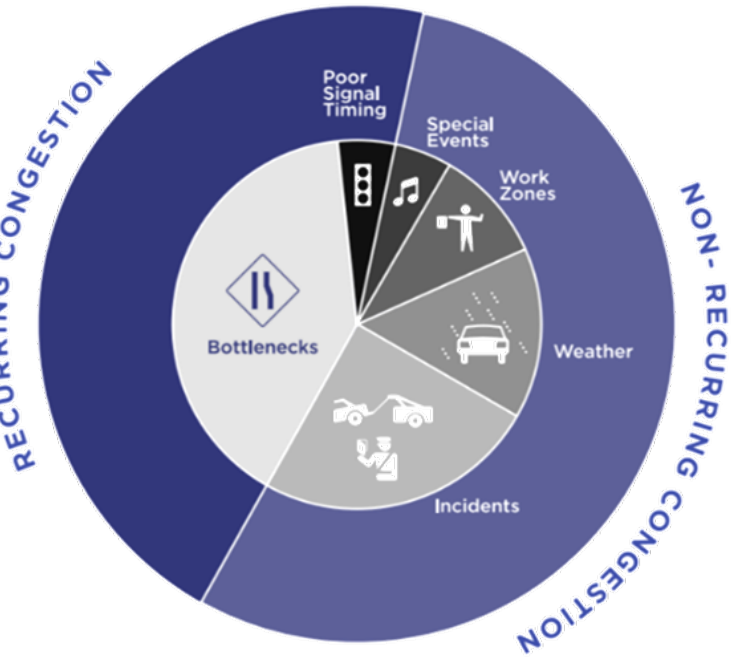
1.1 Causes of Congestion

The process of congestion management begins by understanding the causes of the congestion. Congestion results from the interaction between many different sources but can be broadly classified into two categories:

1. **Recurring congestion** – when the number of vehicles attempting to use a roadway exceeds the capacity of that roadway during peak travel periods (e.g., commute hours). This type of congestion is predictable because travel routes follow a specific pattern with regards to time of day and route selection.
2. **Non-recurring congestion** – unexpected or non-regular disruptions to the normal flow of traffic on a roadway (e.g., traffic incidents, weather, road construction and maintenance, special events). This type of congestion is more difficult to measure and predict.

Figure 1-1 shows the results of a 2015 national study conducted by the Federal Highway Administration (FHWA) (*Incorporating Travel Time Reliability into the Congestion Management Process: A Primer)* on the sources of congestion and the type/category of congestion. The figure shows that while bottlenecks account the largest source disruption, non-recurring congestion events (e.g., special events, work zones, weather, incidents) account for over half of the causes of congestion. This national data is 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.

Figure 1-1: Causes of Congestion



1.2 Purpose and Organization

To carry out the requirements related to congestion management, the Collier MPO regularly updates this CMP documentation, along with the 2020 Transportation System Performance (TSP) Baseline Conditions Report and Action Plan. These documents work together to define the objectives-driven, performance-based approach used by the MPO for integrating the selection and prioritization of congestion-reducing strategies with the Transportation Improvement Program (TIP) and the LRTP.

The outputs of the CMP, such as identified hot spot congested corridors/locations and their recommended mitigation strategies, are evaluated and then prioritized for implementation. The projects or strategies that are identified for implementation through the CMP are then moved into project development and programmed into the TIP for funding and implementation. Once completed, the implemented projects are monitored to evaluate the strategy effectiveness. In Collier County, CMP projects are typically funded using boxed funds identified in the LRTP along with other available local revenues. This allows the MPO to review current needs and fund strategies for implementation which best address congestion.

The 2022 CMP Update is designed to follow the eight actions of the CMP (described in Chapter 2) and is organized as follows:

- **Chapter 1: Introduction** provides an overview of the process and an introduction to the causes of congestion.
- **Chapter 2: CMP Overview** outlines the federal and state requirements governing the development of the CMP and describes the eight-actions of the CMP along with the

general schedule associated with future updates of the Baseline Conditions Report and Action Plan.

- **Chapter 3: Congestion Management Objectives** describes the Goals and Objectives of the CMP.
- **Chapter 4: CMP Network** illustrates the multimodal systems and study area that are evaluated through the CMP.
- **Chapter 5: Congestion Management Performance Measures** presents a summary of system level performance measures and their association to the CMP objectives.
- **Chapter 6: Performance Monitoring and Congestion Analysis** describes the data sources used to determine congested locations and the methodology used for analyzing the congestion hot spot locations.
- **Chapter 7: Implementation Process and Strategy Selection** categorizes the range of congestion reducing strategies based on the causes of congestion and describes how strategies are evaluated and prioritized for implementation.
- **Chapter 8: Evaluation of Implemented Strategies and Projects** defines the MPO's method for evaluating implemented strategies and determining the effectiveness of each relative to the CMP's performance measures.

Figure 1-2 provides a general overview of the MPO CMP, as well as how each step is tied to the MPO planning process, the chapters of this document, and the eight actions outlined in the federal CMP guidance discussed in the next chapter.

Figure 1-2: Congestion Management Process Overview

CMP Step	Action (Chapter)	Addressed By	When
Develop Goals & Objectives	Action #1 (Chapter 3)	TSP / CMP Report Updates	At Least Every 5 Years or As Needed
Define CMP Network	Action #2 (Chapter 4)	TSP Reports	Should Coincide with 5-yr LRTP or Annual TIP Updates
Develop Performance Measures	Action #3 (Chapter 5)	TSP / CMP Report Updates	At Least Every 5 Years or As Needed
Monitor System Performance & Analyze Congestion	Actions #4 & 5 (Chapter 6)	TSP Reports & Performance Monitoring Plan	Ongoing / As Needed
Identify, Asses, & Implement Strategies/Projects	Actions #5 & 6 (Chapters 6 & 7)	Implementation Matrix & Strategy Evaluation Criteria	Annually to Conincide with TIP Funding Process
Evaluate Strategy/Project Effectiveness	Action #8 (Chapter 8)	TSP Report Updates & Project Evaluation & Monitoring Matrix	Systemwide Evaluation Should Coincide with 5-yr LRTP Update; Project Evaluation Should Occur Within 1 Year of Implementation

2.0 CMP Overview

2.1 Federal Guidance

The initial federal requirements for congestion management were introduced by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and were continued under the successor law, the Transportation Equity Act for the 21st Century (TEA-21). The Safe Accountable Flexible Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU) was passed into law in August 2005, and the requirements were further expanded under Moving Ahead for Progress in the 21st Century Act (MAP-21) signed into law on July 6, 2012.

One of the significant changes included in the federal surface transportation program, SAFETEA-LU, was the updated requirement for a "congestion management process" in urban areas with greater than 200,000 people or TMAs, as opposed to a "congestion management system." According to FHWA, the change in name was intended to be a substantive change in perspective and practice to address congestion management through a process that provides for effective management and operations, an enhanced linkage to the planning process based on cooperatively developed travel demand reduction and operational management strategies and capacity increases.

The Fixing America's Surface Transportation (FAST) Act was passed on December 4, 2015. The FAST Act and current Florida Department of Transportation (FDOT) and FHWA guidance stress the importance of identifying performance measures and targets to monitor network performance by evaluating the effect of implemented strategies. The CMP creates a structured process for incorporating congestion issues into the metropolitan planning process – addressing congestion by developing congestion management objectives, developing performance measures to support the objectives, collecting data, analyzing problems, identifying solutions, and evaluating the effectiveness of implemented strategies.

Recently passed, the Infrastructure Investment and Jobs Act was signed into law by the President on November 15, 2021, and continues the performance-driven approach to addressing congestion. Future opportunities included in this legislation which aim to address carbon emissions and congestion management technologies will expand the strategies and funding opportunities available to the MPO for addressing congestion once rulemaking for the new legislation has been developed.

According to FHWA's "Congestion Management Process: A Guidebook", published in April 2011, a CMP is "a systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. The CMP is intended to move these congestion management strategies into the funding and implementation stages."

The eight actions identified in the Guidebook for preparing a CMP are shown in Figure 2-1.

Figure 2-1: Eight Actions of the Congestion Management Process

2.2 State Requirements

In addition to the federal mandates for MPOs, Chapter 339.177, Florida Statutes, requires the FDOT to develop and implement a traffic congestion management process for managing programs and systems in cooperation with the 27 MPOs in the state of Florida.

2.3 Previous Updates

The original Naples (Collier County) Congestion Management System Manual was created in 1997 to be consistent with 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. A major update to the CMS was completed in December 2006 and was incorporated into the 2030 LRTP to identify the prioritization process for the MPO's CMS funding set-aside (boxed funds) of Federal Transportation dollars. The 2006 CMS Update incorporated some of the management process changes required with the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

In 2008, the MPO's Congestion Management System / Intelligent Transportation System (CMS/ITS) Stakeholders Committee suggested revising the CMS Process to integrate the management and operations strategies required by the FHWA and Federal Transit Administration (FTA). In 2017, the Collier MPO updated the CMP to make the document current with the 2040 LRTP adopted in December 2015 and with new Moving Ahead for Progress in the 21st Century Act (MAP-21) federal legislation that was signed into law on July 6, 2012, and followed by the Fixing America's Surface

Transportation (FAST) Act which was signed into law on December 4, 2015. MAP-21 and the FAST Act require performance-based and data-driven planning. MPOs are required to actively engage stakeholders in developing plans and performance targets. The MPO's CMS/ITS Committee played an instrumental role in the development of the scope and revisions to the 2017 CMP Update.

2.3.1 2017 Initiatives

The CMS/ITS Committee, through a year-long process reviewed draft updates to the 2008 CMP and ultimately concluded that the following initiatives were necessary to lay the foundation for a data-driven planning process to identify congestion hot spots, analyze alternative solutions, and prioritize projects for MPO Board adoption.

Thinking Beyond the CMS Boxed Funds

The 2017 Update expanded the Committee's focus beyond the typical signal timing adjustment and technology upgrade projects to consider multi-modal investments such as constructing bus shelters and bicycle/pedestrian facilities. The 2017 Update considered the full range of funding available to address congestion by adding capacity to the existing road system and seeking ways to increase transit ridership and ridesharing, and more proactively link access to transit stops from bicycle/pedestrian facilities, transit hubs and the "last mile" connectivity that transit users depend on.

Transportation System Performance Reports

The 2017 Update called for the completing of a biennial TSP reporting process to provide accurate, up-to-date information on system performance and assess alternative strategies for congestion management that meet state and local needs. The first Performance Report was completed in 2020 and included an action plan for improving the CMP as well as recommendations being incorporated into this document.

Performance Measures

Previous updates to the CMP identified various performance measures but stopped short of requiring their application. The 2017 Update identified performance measures used by project sponsors to establish baseline measures, project performance, and the ability to report future results to the MPO Board. The connection of performance measures with strategy effectiveness was further developed in the TSP Action Plan by correlating the performance measures with the objectives of the CMP.

Recurring Projects

The 2017 Update also identified and committed future funding for recurring projects reflective of good business practices – maintaining ITS infrastructure that is consistent with the FDOT Regional ITS architecture, for example. This category of projects does not lend itself to measuring system performance, but rather better connected to preserving the existing transportation infrastructure by remaining current with technology.

2.4 2022 Update

The 2022 CMP Update brings the document current with the MPO's 2045 LRTP adopted on December 11, 2020. This latest update also incorporates recommendations made by the MPO's initial TSP Baseline Conditions Report and Action Plan, which were approved by the MPO Board on September 11, 2020. The development process of the TSP Baseline Conditions Report and Action Plan identified congested roadway segments in Collier County, as well as strategies for addressing congestion, a new goal and objectives for the CMP, multimodal performance measures, and criteria for evaluating congestion management strategies and prioritizing congestion reducing projects. New information in this CMP update is mostly procedural in nature. The 2022 CMP Update is not based on an analysis of new congestion data or an evaluation of specific recent strategies. Instead, it incorporates the new elements from the initial TSP effort and defines how they will be a part of the MPO's CMP and larger planning process in the future. The MPO Congestion Management Committee (CMC), formerly the CMS/ITS Committee, helped steer the TSP process and the integration of its recommendations into this CMP update.

2.5 Future Updates

As part of the MPO's continual monitoring of the CMP, updates to this document and the TSP reports should be anticipated. These updates should coincide with regular updates of the MPO's core planning products, as well as changes in any CMP-related requirements in the future.

2.5.1 CMP Document

The CMP provides the framework of the process by outlining all 8 actions with a specific emphasis on the first 3. The policy direction included as part of the first three actions guides the technical analysis conducted as part of actions 4 through 8. The CMP document also serves as the guidance document for conducting future analysis of congested locations and evaluation of implemented strategies. Review and update of this document should be conducted 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 would benefit integration of CMP strategies into the LRTP. Additional updates should be considered on a more frequent basis when changes are made in federal rules or local regulations.

2.5.2 Transportation System Performance Reports

The MPO has identified a biennial schedule for updating the TSP reports. This cycle allows for the identification of congested conditions and potential strategies consistent with the LRTP update cycle, and again between LRTP updates. This update cycle also provides the MPO with the opportunity to evaluate strategies that have been funded and implemented through the TIP.

2.5.3 Implementation of Strategies

Consistent with the MPO's current policy, funding for multimodal CMP projects occurs through the project prioritization process and TIP development. In addition to funding specific projects, the MPO can also incorporate corridor and feasibility planning studies in the Unified Planning Work Program as an opportunity to better define appropriate strategies for addressing congestion.

3.0 Congestion Management Objectives

The first action of the CMP is to identify the Regional Objectives. The CMP Goal and Objectives are used to guide the process of monitoring congestion and improving the mobility of persons and goods in Collier County. They also inform the selection of CMP performance measures used to quantify congestion levels, as well as help to identify and prioritize congestion management strategies.

3.1 CMP Goal

The MPO's overarching CMP Goal is to:

> **Improve Collier County's transportation system performance and reliability through mitigating congestion and improving the safety and mobility of people and goods.**

3.2 CMP Objectives

As a part of the TSP Action Plan's recommended enhancements to the CMP process, a review was conducted of CMP goals and objectives used by other MPOs in Florida and nationwide that would complement the Collier MPO's 2017 CMP Objectives.

The following Objectives were reviewed by the CMC and approved by the MPO Board for providing more specific guidance and direction in evaluating the performance measures and strategies of the CMP.

Objective 1: Improve the safety of transportation facilities.

Objective 2: Integrate the Congestion Management Process and its proposed improvements into the LRTP, TDP, and Bicycle/Pedestrian Master Plan, and support the integration of transportation and land use.

Objective 3: Develop, maintain, expand, and close gaps in pedestrian, bicycle, and shared-use path facility networks for efficient and safe movement of people. Connect these pedestrian and bicycle facilities to existing and future transit stops.

Objective 4: Reduce vehicle miles traveled (VMT) by encouraging alternative modes of transportation, supporting sustainable land use development, and creating an integrated multimodal transportation system.

Objective 5: Optimize the movement of goods.

Objective 6: Promote transportation investments that support the LRTP's priorities, goals, and objectives.

3.3 LRTP Goals and Objectives Related to Congestion

In addition to the CMP Goal and Objectives, the MPO's 2045 LRTP includes multiple goals and objectives that are either specifically intended to reduce roadway congestion or supplement the CMP effort. Because the eight actions followed by the CMP are integrated into the metropolitan planning process, the LRTP and other MPO planning efforts work in tandem with the CMP in terms

of desired outcomes. Even though the LRTP is focused on longer-term transportation investments as compared with the CMP's shorter-term implementation, an improved multimodal transportation system is a shared purpose of both efforts. As such, the most relevant CMP-related goals and objectives from the 2045 LRTP are listed below.

It should be noted that these are included for informational and planning consistency purposes only. They do not have corresponding performance measures that are formally evaluated as a part of the CMP.

LRTP Goal #4: Reduce Roadway Congestion

CMP-Related Objectives

- Reduce the number of deficient roadways (those with a high volume-to-capacity ratio) identified in the 2045 existing-plus-committed (E+C) network
- Reduce travel delay between residential areas and key destinations

LRTP Goal #5: Promote Freight Movement

CMP-Related Objectives

- Enhance movement on major regional freight mobility corridors or freight distribution routes s

LRTP Goal #6: Increase the Safety of the Transportation System for Users

CMP-Related Objectives

- Reduce the number of fatalities, injuries, and crashes
- Ensure adequate bicycle and pedestrian facilities are incorporated into new highway and transit projects
- Implement safety-related improvements on high crash corridors

LRTP Goal #7: Promote Multimodal Solutions

CMP-Related Objectives

- Improve frequency and reliability of public transit service routes and improve access to park-and-ride lots
- Improve pedestrian and bicycle facilities
- Implement Complete Streets policies

LRTP Goal #8: Promote the Integrated Planning of Transportation and Land Use

CMP-Related Objectives

- Coordinate with local governments and partner agencies to assure transportation plans and programs support local land use plans and a sustainable transportation system
- Assure that local growth management objectives are reflected in transportation plans and programs

4.0 CMP Network

The second action is to define the CMP Network. This involves defining both the geographic scope and transportation elements which are analyzed in the CMP. It should be noted that the CMP network described in the sections below is for demonstration purposes. Defining this network is an ongoing process. In the future the most recent version of the CMP network, which incorporates the most recent elements of other MPO planning products, should always be used.

4.1 CMP Coverage Area

The Collier MPO CMP covers 2,025 square miles which is the entire physical area of Collier County (including the City of Naples, Marco Island, and Everglades City). The population of Collier County increased by approximately 53% from 1990 to 2000, 28% from 2000 to 2010, and 17% from 2010 and 2020. Based on the 2020 Census results, 375,752 people reside in Collier County. This estimate is expected to grow to 510,237 by 2045 per the Collier Interactive Growth Model (CIGM) projections used for the 2045 LRTP. The County is also anticipated to see continued growth in employment with a projected 212,780 jobs in 2045, representing a 49% increase over the total employment in 2015. The coverage area for the CMP is illustrated on the maps shown on the following pages.

4.2 Roadway Network

The CMP roadway network (Figure 4-1) includes all existing functionally classified roadways and those funded for construction, known as the existing-plus-committed (E+C) network. Updated for the TSP Baseline Conditions Report, this network reflects the roadway network anticipated to be open to traffic in 2023.

4.3 Bicycle & Pedestrian Network

The CMP network also includes the bicycle, sidewalk, and shared use path facilities identified in the MPO's *Bicycle/Pedestrian Master Plan*, which was adopted in March 2019 and amended in February 2020. In addition to providing more transportation options, implementation of these non-motorized facilities (shown in Figure 4-2) in can also help address roadway congestion:

- **Shared Use Paths:** a facility separated from motorized vehicular traffic and only open to non-motorized traffic.
- **Connector Sidewalks:** a sidewalk that provides cyclists the option of a connection that is separate from vehicular traffic, identified only where there are gaps in the cycling network.
- **Bike Lanes:** a portion of a roadway which has been designated by striping, signing, and pavement markings for the use of bicyclists.

4.4 Transit Network

The transit routes operated by Collier Area Transit (CAT) provide a vital component of the CMP when considering transportation options and the ability to reduce dependence on private autos in congested locations. Existing transit routes included in the 2021-2030 Transit Development Plan (TDP) (Figure 4-3) complete the transportation systems included in the MPO's CMP Network. Potential improvements to this transit network must be consistent with the most recent CAT TDP and the transit element of the MPO's most recent LRTP.

Figure 4-1: Collier MPO CMP Network (2023 Planned Number of Lanes)

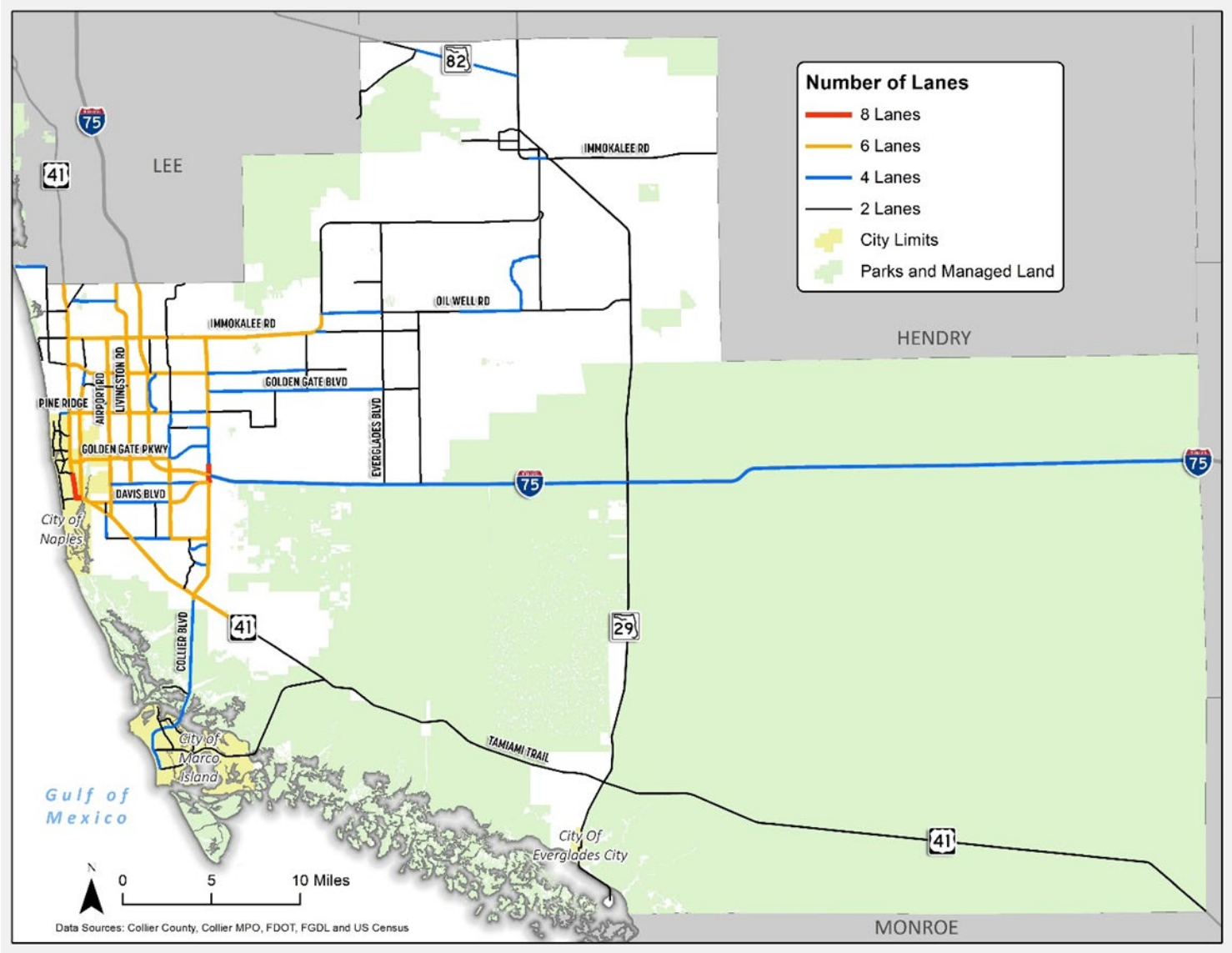


Figure 4-2: Bicycle and Pedestrian Facilities Along the CMP Network

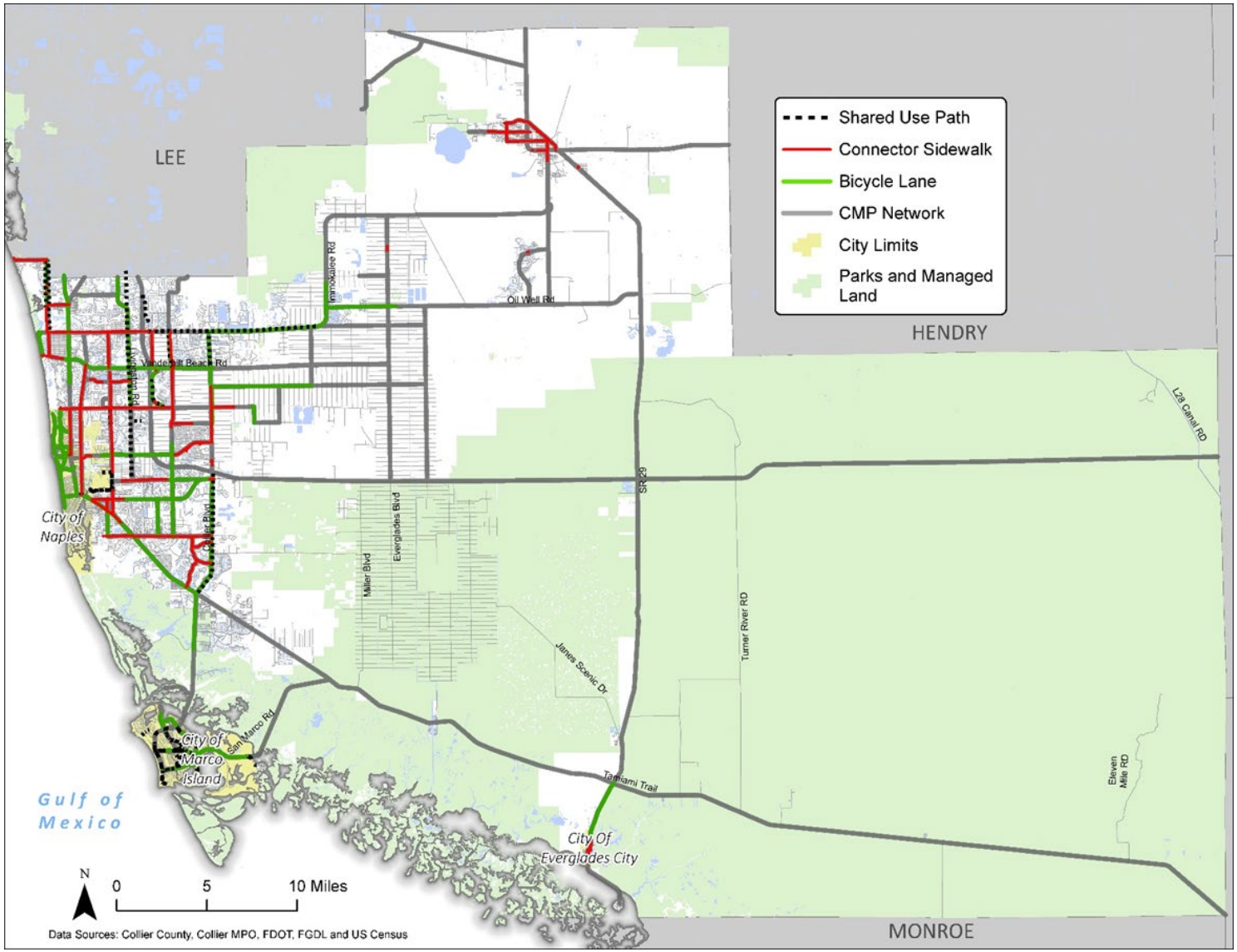
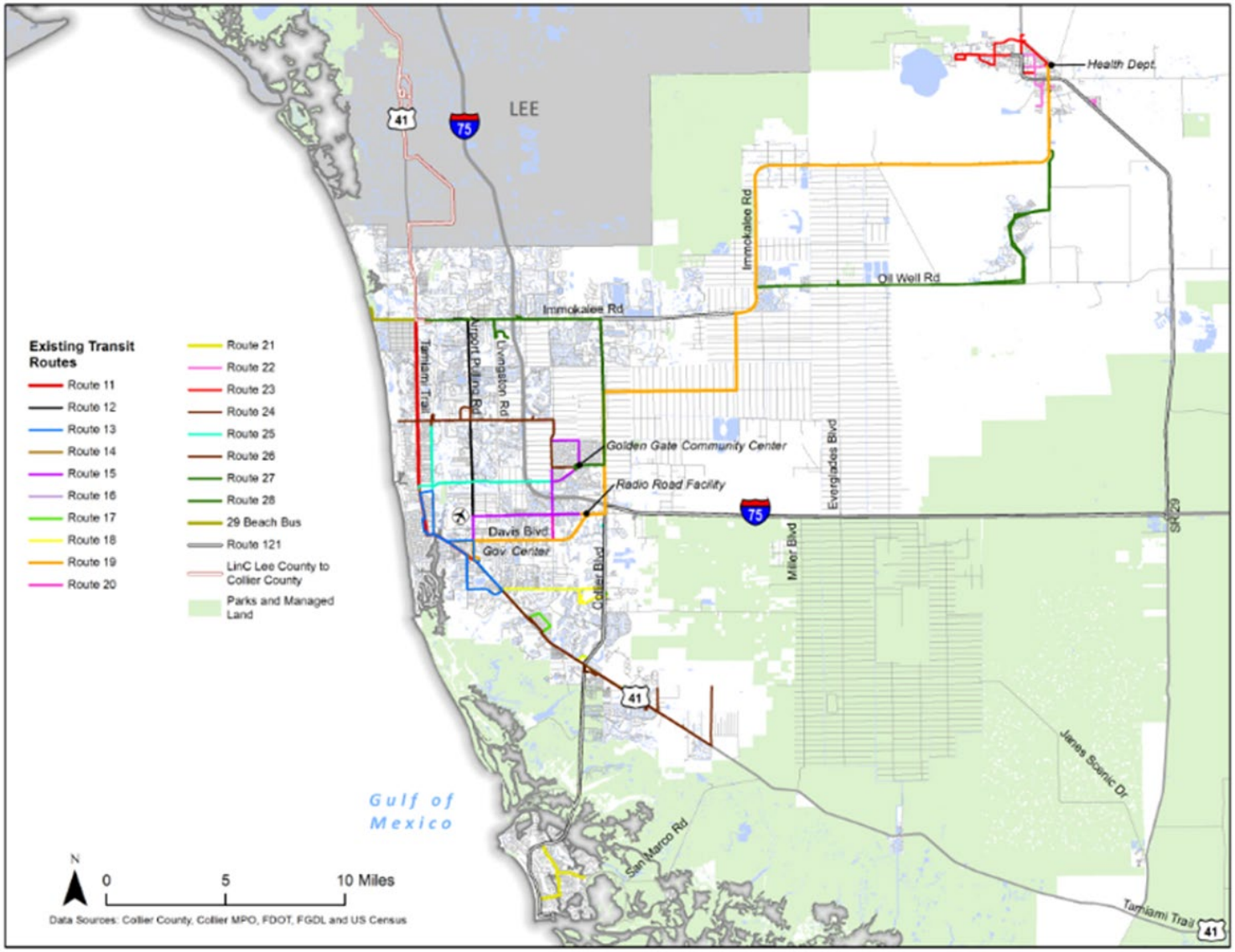


Figure 4-3: Transit Routes Operated by Collier Area Transit



5.0 Congestion Management Performance Measures

Developing performance measures related to and in support of the CMP objectives for evaluating congestion is the third action of the CMP. These performance measures are data-based methods used to measure and monitor the effectiveness of the transportation system in the CMP.

5.1 Multimodal Performance Measures

The MPO's CMC has previously researched, evaluated, and established performance measures during prior updates of the CMP. As part of the 2020 TSP process, the list was modified and expanded to include the following measures, which have been selected to track system performance over time, measure progress towards meeting the CMP Objectives, and evaluate the effectiveness of congestion management strategies. These performance measures are organized into a series of categories based on the multimodal system and transportation users:

TRAVEL DEMAND:

- Percent of roadway miles by volume-to-capacity (V/C) ratio
- Percent of vehicle miles traveled (VMT) by V/C ratio
- Number of signalized intersections connected to Advanced Traffic Management System (ATMS)

SAFETY:

- Total crashes
- Motor vehicle severe injury crashes
- Motor vehicle fatal crashes
- Pedestrian and bicycle severe injury and fatal crashes

TRANSIT TRAVEL:

- Average bus route service frequency and number of routes
- Passenger trips (annual ridership)
- Passenger trips per revenue hour
- Transit on-time performance

GOODS MOVEMENT:

- VMT on designated truck routes with a V/C ratio greater than 1.0
- Number of crashes Involving heavy vehicles/trucks

PEDESTRIAN/BICYCLE FACILITIES:

- Centerline miles of bicycle lanes
- Linear miles of connector sidewalks on arterial roadways
- Linear miles of shared-use paths adjacent to roadways

TRANSPORTATION DEMAND MANAGEMENT (TDM):

- Number of people registered in the FDOT Commute Connector database that have an origin in Collier County

ACCESSIBILITY:

- Share of regional jobs within a ¼-mile of transit
- Share of regional households within a ¼-mile of transit

INCIDENT DURATION

- Mean time for responders to arrive on-scene after notification
- Mean incident clearance time
- Road Ranger stops

CUSTOMER SERVICE

- Nature of comments/responses and customer satisfaction

SYSTEM RELIABILITY

- Average Travel Speed
- Travel Time Index
- Congestion %

5.2 Alignment with CMP Objectives

Table 5-1 illustrates the alignment between the multimodal performance measures and the objectives that guide the CMP. It shows how each measure assesses system performance to help achieve the desired outcome stated by the CMP Goal and Objectives discussed in Chapter 3.

Table 5-1: CMP Performance Measure and Objective Alignment

		Objectives					
Category	**Performance Measures**	**1**	**2**	**3**	**4**	**5**	**6**
Travel Demand	Percent of roadway miles by volume-to-capacity (V/C) ratio		✓			✓	✓
	Percent of vehicle miles traveled (VMT) by V/C ratio		✓			✓	✓
	Number of signalized intersections connected to Advanced Traffic Management System (ATMS)		✓			✓	✓
Safety	Total crashes	✓		✓			✓
	Motor vehicle severe injury crashes	✓		✓			✓
	Motor vehicle fatal crashes	✓		✓			✓
	Pedestrian and bicycle severe injury and fatal crashes	✓		✓			✓
Transit Travel	Average bus route service frequency and number of routes		✓		✓		✓
	Passenger trips (annual ridership)		✓		✓		✓
	Passenger trips per revenue hour		✓		✓		✓
	Transit on-time performance		✓		✓		✓
Pedestrian/ Bicycle Facilities	Centerline miles of bicycle lanes			✓	✓		✓
	Linear miles of connector sidewalks on arterial roadways			✓	✓		✓
	Linear miles of shared-use paths adjacent to roadways		✓	✓	✓		✓
Goods Movement	VMT on designated truck routes with a V/C ratio greater than 1.0		✓			✓	✓
	Number of Crashes Involving Heavy Vehicles/ Trucks	✓	✓			✓	✓
TDM	Number of people registered in the FDOT Commute Connector database that have an origin in Collier County		✓		✓		✓
Accessibility	Share of regional jobs within a ¼-mile of transit		✓		✓		✓
	Share of regional households within a ¼-mile of transit		✓		✓		✓
Incident Duration	Mean time for responders to arrive on-scene after notification	✓					✓
	Mean incident clearance time	✓					✓
	Road Ranger stops	✓					✓
Customer Service	Report on nature of comments/responses and customer satisfaction.		✓				✓
System Reliability	Average Travel Speed		✓				✓
	Travel Time Index		✓				✓
	Congestion %		✓				✓

6.0 Performance Monitoring and Congestion Analysis

Once the framework of the CMP has been established through the first three actions, the monitoring of system performance and analysis of congestion should lead to more effective investment decisions that result in a safer and more efficient transportation network.

6.1 Monitoring System Performance

As the fourth action of the CMP, collecting data and monitoring conditions provides insight into the performance of the transportation system. Cooperatively with the MPO's planning partners, the process of data collection should be an ongoing activity. The ongoing nature of data collection provides a benefit to the MPO in preparing updates to the TSP reports through access to current and updated information. Consistent with the measures presented previously in Table 5-1, monitoring system performance includes review of data from all modes of travel considered in the CMP. Shown in Table 6-1, the system performance monitoring plan outlines the measures and data sources to be used in future updates of the TSP process.

Table 6-1 Performance Monitoring Plan

Performance Measures	Monitoring Activity	Data Source & Responsible Agency
• % of roadway miles by volume-to-capacity (V/C) ratio • & of vehicle miles traveled (VMT) by V/C ratio • VMT on designated truck routes with a V/C ratio > 1.0	MPO CMP Database; LOS analysis	Collier County AUIR; FDOT LOS spreadsheet; Naples traffic counts
• Number of signalized intersections connected to Advanced Traffic Management System (ATMS)	Collier County CIP	Collier County Traffic Operations
• Total crashes • Motor vehicle severe injury crashes • Motor vehicle fatal crashes • Pedestrian and bicycle severe injury and fatal crashes • Number of Crashes Involving Heavy Vehicles/Trucks	Safety Performance Measures Report; Crash Data Analysis	Collier MPO / FDOT Collier County CDMS
• Average bus route service frequency and number of routes • Passenger trips (annual ridership) • Passenger trips per revenue hour • Transit on-time performance	National Transit Database Reporting	Collier Area Transit
• Centerline miles of bicycle lanes • Linear miles of connector sidewalks on arterial roadways • Linear miles of shared-use paths adjacent to roadways	Bicycle/Pedestrian Master Plan	Collier MPO
• Number of people registered in the FDOT Commute Connector database that have an origin in Collier County	District 1 Commute Connector	FDOT
• Share of regional jobs within a ¼-mile of transit • Share of regional households within a ¼-mile of transit	GIS analysis during TSP Update	Collier MPO / RITIS Database
• Mean time for responders to arrive on-scene after notification • Mean incident clearance time • Road Ranger stops	Road Rangers Performance Measures Report	FDOT

Performance Measures	Monitoring Activity	Data Source & Responsible Agency
• Report on nature of comments/responses and customer satisfaction.	Traffic Operations Citizen Survey	Collier County Traffic Operations
• Average Travel Speed • Travel Time Index • Congestion %	Data Analysis during TSP Update	Collier MPO / RITIS Database

6.2 Measuring Congestion in Collier County

The fifth action of the CMP is to analyze congestion problems and needs using data and analysis to identify the location and causes of congestion that exist. To accomplish this, the Collier MPO CMP utilizes a variety of data sources to evaluate recurring and non-recurring sources of congestion.

6.2.1 Identifying Congestion Hot Spots

Congestion is traditionally understood to be the level at which the transportation system performance is no longer acceptable due to traffic delays. Consistent with the multimodal nature of congestion and the causes of congestion, the CMP includes a multi-data approach for identifying areas of congestion. The data sources chosen to evaluate and provide context to congestion within the CMP network include:

- **Volume-to-Capacity Ratios:** Existing plus committed (E+C) roadway segments with a V/C ratio greater than, or equal to 1
- **Travel Time/Speed Based Results:** Roadways with recorded speeds of less than, or equal to 23 mph.
- **School Related Congestion:** Road segments adjacent to schools with congestion issues.
- **Hot Spot Safety Locations:** Intersections and road segments with the highest frequency and rate of crashes
- **Congestion Survey:** Public Outreach Results

The results and analysis of these data sources serves as an essential bridge between the evaluation of system performance data and the identification of potential strategies to address congestion. Congested areas based on these data sources are measured, for the purpose of identifying hot spots and needed network improvements.

Problem congestion areas identified by conducting a geospatial analysis of the recurring and non-recurring data sources is used to identify congestion hot spot locations within Collier County. The hot spot locations are sorted into three tiers to further identify which of the hot spot locations had the most causes of congestion.

- **Tier 1:** represents road segments influenced by 3 or more congestion causes.
- **Tier 2:** represents road segments influenced by 2 congestion causes.
- **Tier 3:** represents road segments influenced by 1 congestion cause.

6.2.2 Analyzing Congested Locations and Needs

Prior to conducting analysis of the congestion hot spots, the most recent CMP network is compared against projects already programmed through the MPO's current TIP. Once areas of overlapping congestion and programmed projects with committed funding have been identified, the MPO's CMP focuses on various analyses of congested areas in order to develop an understanding of the needs and causes of congestion:

- **Safety Analysis:** as part of future TSP updates or as a result of independent safety studies, analysis of crash trends identifies crash trends and recommended safety countermeasures to be considered.
- **School Analysis:** The School District of Collier County keeps a list of traffic congestion concerns and related schools. Compared with schools that have a high percentage of school bus eligible students is used to prioritize locations where the School Congestion Matrix (Appendix A) can be reviewed to determine the most appropriate strategies for implementation.
- **Transit Analysis:** In cooperation with Collier Area Transit, the MPO's CMP recognizes the transit capital and infrastructure improvements that are programmed through the Transit Development Plan. Providing reliable and dependable transportation alternatives to the personal automobile will result in lowered auto-oriented travel demand and congestion. Past efforts have included a regional park and ride study as well as a Transit Impact Assessment for developing standards and funding strategies.
- **Bicycle and Pedestrian Analysis:** Completing gaps in the bicycle and pedestrian network is a key component for providing a safe and connected transportation network. Comparing the Bicycle and Pedestrian Master Plan projects with areas of congestion emphasizes those areas where the objectives of both planning efforts can be prioritized for implementation.
- **Intersection Analysis:** Addressing intersection operations within the hot spot congestion locations is accomplished through the use of microsimulation programs designed to identify changes to traffic signal timing and intersection modifications. Additional analysis to consider alternative intersection designs and concepts is completed through use of the Intersection Control Evaluation (ICE) Process.
- **Travel Time Reliability Analysis:** Using probe data sources that record travel speeds, congestion, and delay, is provided through the Regional Integrated Transportation Information System (RITIS) database. This level of traffic data helps to identify time-of-day specifics related to congestion and transportation reliability.

6.3 Congestion Management Strategies

Federal guidance recommends that the identification of congestion management strategies be based on their ability to support regional congestion management objectives, meet local context, and contribute to other regional goals and objectives. Strategies that effectively manage congestion and achieve the previously mentioned CMP Goal and Objectives have been selected to meet Collier County's specific needs. The 2022 CMP Update process includes the following CMP Strategies that were identified and added to the existing strategies list based on the analysis that was conducted in the 2020 TSP Baseline Conditions Report, which also identified causes and locations of congested corridors, and the TSP Action Plan, which analyzed and identified congestion mitigation strategies for the specific corridors. The main additions made for this CMP update include safety strategies and strategies to address school-related congestion. Table 6-2 lists the category and respective CMP Strategies identified to mitigate congestion on the CMP Network in Collier County.

Table 6-2: CMP Strategies

STRATEGIES: Demand Management (Programmatic), Transportation & Land Use Policy	Improved incident management
	Carpool/Vanpool Assistance and Carpool/Vanpool Technology including School Carpooling Apps
	Flexible Work Hours
	Transit Vouchers
	Transit Oriented Development
	Jobs/Housing Regional Balance
	Implement Complete Streets Policy All New Development
	High-Density & Mixed-Use Fixed Route Corridor
	School Dismissal timing (e.g., stagger dismissal times, dismissal automation software)
	Walking, Biking, Transit and School Bus Awareness/Education campaigns
	Safe Routes to School & School Zone Traffic Congestion Study
	Origin-Destination Study
STRATEGIES: Safety	Signage and Pavement Markings (e.g., special emphasis crosswalks, yield/stop for pedestrian signs, advanced street signs)
	Visibility and Sightline Improvements
	New and upgraded street lighting
	Traffic control devices (e.g., left turn signals, variable message signs, pedestrian hybrid beacons)
	New and upgraded existing bicycle and pedestrian crossings

STRATEGIES: Transit	Amenities to Attract New Ridership
	MPO transit service expansion and improvement (e.g. frequency, hours of operation, realign routes)
	Regional Transit system Expansion
	Bus rapid transit corridor
	Park & Ride facilities
	Intermodal Hubs
	Transit ITS and MOD
	Arrival Prediction Technology
	Park-and-Ride lots
STRATEGIES: ITS & Access Management - Active Roadway Management	Expanded traffic signal timing & coordination - ITS
	Traffic Center Operations Enhancements
	Traffic signal equipment modernization - ITS
	Traveler information devices - ITS
	Communications networks & roadway surveillance - ITS
	Access management
	School Zone Traffic Calming Measures
	School Zone pedestrian and traffic signal optimization
	School off-site waiting lots and curbing and parking zones
STRATEGIES: Physical Roadway Capacity Enhancement	Intersection Improvements
	Replace intersections with round-abouts & other innovative designs
	Deceleration lanes and turn lanes
	New grade-separated intersections
	New travel lanes (general purpose)
	New roadway network connections
STRATEGIES: Bicycle & Pedestrian Facilities	New off-street pedestrian and multi-use facilities to close gaps in the transportation network and make connections to key destinations
	Integrated into TODs, High Density Corridors
	Regional Bike/Ped Facilities
	Complete Streets on New Facilities & Retrofit or new on-street bicycle
	Supporting bicycle infrastructure (e.g. secure and convenient parking, bike repair and pumps)

Using the full list of strategies available for mitigating congestion, the primary purpose of the CMP, Action 6, is to identify a set of recommended strategies for to manage congestion and achieve the CMP Objectives. To accomplish this task, the MPO has developed the CMP Implementation Matrix that is included in Appendix B.

In the 2017 CMP Update, this matrix presented congestion management/ITS projects from the 2040 LRTP Cost Feasible Plan and evaluated projects submitted as congestion management strategies. As a part of the development process of the 2020 TSP reports, the CMP Implementation Matrix was updated to target the congestion hot spot locations identified in the TSP Baseline Conditions Report. The updated CMP Implementation Matrix lists the congested corridors and identifies the most appropriate CMP Strategies that can be used along the corridors to mitigate the causes of congestion. These strategy recommendations are based on the analysis documented in the TSP Action Plan, and provide the MPO's planning partners with an expanded opportunity to develop future projects which address a range of multimodal and congestion reduction considerations.

7.0 Implementation Process and Strategy Selection

The sections below summarize the implementation and management of CMP Strategies, including the process for selecting strategies/projects for implementation on congested corridors, as well as the sources and funds for implementing the proposed projects consistent with Action 7.

7.1 CMP Strategy Evaluation Criteria

The MPO CMC plays an integral role in identifying congestion mitigation strategies with the greatest potential benefit. The purpose of the CMP Strategy Evaluation Criteria is to screen project submittals for consistency with the CMP Goal and Objectives, Strategies, and identified hot spots. Once projects are developed consistent with the strategies identified in the CMP Implementation Matrix and submitted for funding, the evaluation and prioritization of these projects is conducted by the CMC using the CMP Strategy Evaluation Criteria. These criteria were updated as part of the development of the 2020 TSP Action Plan to incorporate certain performance measures from the 2017 CMP Update that were better suited as strategy evaluation criteria. This 2022 CMP Update includes these changes, with the updated CMP Strategy Evaluation Criteria shown in Appendix C.

The CMC uses these criteria as the basis for making project recommendations to the MPO Board as priorities for funding in the 5-year TIP cycle, consistent with the current LRTP. The CMP projects that are moved into project development and programmed in the TIP are funded using boxed funds identified in the current LRTP, along with other available local revenues. The typical annual funding allotment and cumulative programmable amounts are outlined in the TIP.

In addition to the boxed funds available for CMP projects, the MPO has access to additional state and federal revenues through partnership with FDOT and other regional partners. While not exclusively allocated to transportation projects in Collier County, other revenues managed by FDOT are available for transportation projects within Southwest Florida. By identifying and prioritizing congestion reduction projects, the MPO can request funding from a variety of sources available for that purpose. These potential revenue sources include:

- National Highway Performance Program
- Highway Safety Improvement Program
- Surface Transportation Program Block Grant– Any Area
- Transportation Regional Incentive Program

7.2 Future Studies

In addition to location specific strategies, the MPO has identified future potential studies which support the objectives of the CMP. These studies can be considered for inclusion in the MPO's Unified Planning Work Program (UPWP). Potential funding sources include Planning (PL) funds, CMS/ITS "Box" funds, and Transit Planning funds based on funding eligibility and study purpose.

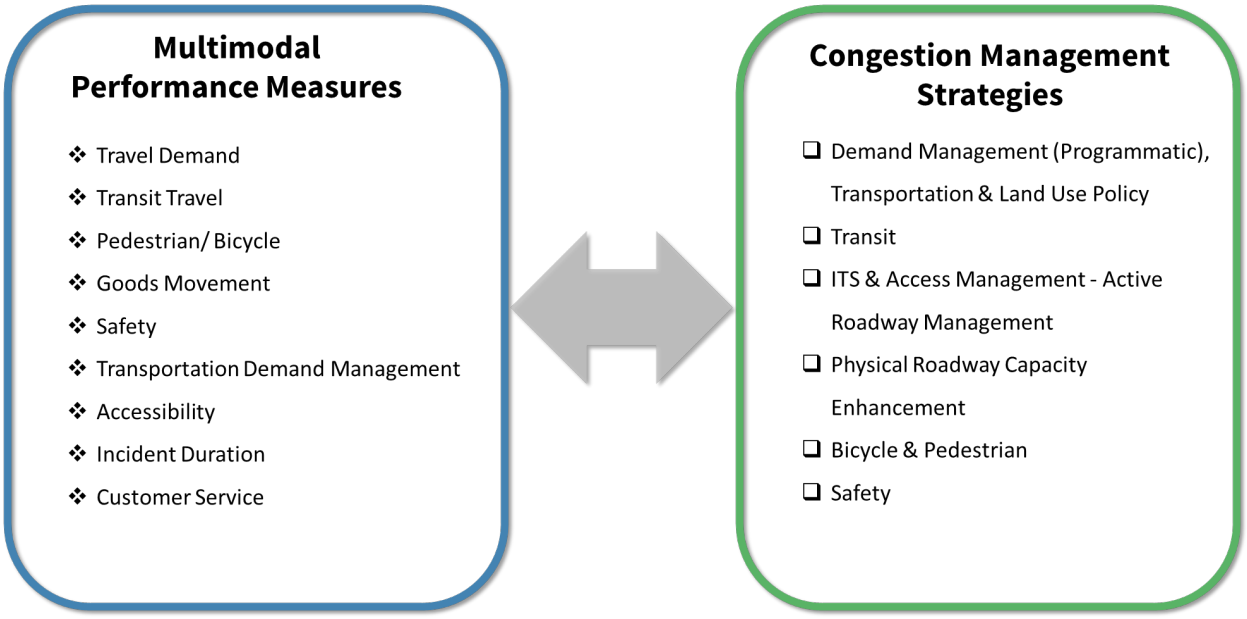
Past examples of studies funded through the UPWP have included the first iteration of the TSP reports, Regional Park and Ride Study, and Land Use & Transportation Scenario Testing.

8.0 Evaluation of Implemented Strategies and Projects

This final action of the CMP is to evaluate the effectiveness of implemented strategies. To accomplish this, the MPO has developed the following methods and schedule for monitoring system performance and tracking the effectiveness of implemented congestion management strategies/projects, which is a key responsibility shared between sponsoring agencies and the MPO. The evaluation of strategies is an MPO requirement for Major LRTP Updates, and enables decision makers, the CMC, and the public the opportunity to identify the most effective CMP Strategies for future implementation. These results also provide valuable feedback that allow the MPO to make necessary changes to the CMP.

Monitoring the effectiveness of implemented strategies is conducted at a systemwide and project-level scale using the quantifiable CMP Performance Measures. The framework for this monitoring process was established in the 2020 TSP Baseline Condition Report, which set an initial baseline using 2018-2020 data for comparison against future evaluations and CMP analyses.

Additionally, the performance measures serve as a tool to evaluate project level effectiveness of the implemented congestion management strategies.



8.1 Project Evaluation Process

The Congestion Management Project Application Submittal Form (Appendix D) requires each sponsoring agency to identify the:

1. CMP Strategy Category the project is using,
2. CMP Performance Measure(s) the project will address, and
3. Data and criteria that will be used to measure the effectiveness of the project.

The sponsoring agency is responsible for compiling the necessary data, conducting the performance evaluations, and producing a user-friendly, performance-based report that demonstrates the link between the results of the project and stated CMP Strategies and Performance Measure(s). The report must be presented to the CMC within one year of the project becoming fully operational, and must include the change in conditions resulting from the project. As congestion management projects are implemented, their impacts will be reviewed and accounted for in the MPOs planning process.

Table 8-1 shows an example of a previous CMP Project Evaluation and Monitoring Matrix which includes the Congestion Management Projects funded in adopted TIP at the time it was created. CMP priorities previously identified were not required to establish strategies and performance measures when approved. This model, however, will be used for upcoming projects for post-implementation measuring. Future congestion management priority projects will be transitioned to this evaluation model and should be updated by the sponsoring or implementing agency, in conjunction with the MPO staff, as the projects advance.

8.2 CMP and TSP Report Updates

The CMP is reviewed annually and updated on an as needed basis. At a minimum, the CMP needs to be updated to maintain consistency when updates to the TSP Report and LRTP occur. The TSP reports are reviewed periodically and updated as needed, whereas the LRTP is updated on a regular schedule every five years and amended as necessary in between. As congestion management projects are implemented, their impact will be reviewed and accounted for in the LRTP and other parts of the MPO's planning process.

8.3 Public Feedback

Regular feedback is received regarding roadway segment operation throughout the metropolitan transportation system planning process. This manifests itself in the ongoing activities of MPO staff and from interaction with local public officials. The Collier MPO website (www.colliermpo.com) describes the CMP and accepts public comments on the process or congestion in Collier County. Written public comment may also be submitted to:

Collier Metropolitan Planning Organization
Attention: Executive Director
2885 South Horseshoe Drive
Naples, FL 34104

Feedback may indicate that an additional segment is congested or has the potential to develop a congestion problem. Such a segment should be added to the CMP coverage area to ensure an increased level of scrutiny. Once added, the segment would then automatically be reviewed during the ongoing CMP evaluation activities.

Table 8-1: CMP Evaluation and Project Monitoring Matrix

ITS Projects (2019 CMP Priorities)	FPN	Funded Amt	TIP/CIP YR	Congestion Management Strategy	CMP Performance Measure(s)	Benefits Achieved	Prioritization Date(s)
ITS Fiber Optic and FPL Power Infrastructure: 13 locations	4462501	$ 272,725	CST 2024/25				
Travel Time Data Collection & Performance Measurements	4462511	$ 700,000	CST 2024/25				
Updated School Flasher System	4462521	$ 353,250	CST 2020/21				
Vehicle Count Station Update	4462541	$ 311,562	CST 2024/25				
Bicycle Detection Systems: 4 intersections: US41/Central Ave, US41/3rd Ave S; Park Shore Drive/Crayton Rd: 8th St S/3rd Ave S	4462531	$ 66,429	CST 2023/24				
Adaptive Traffic Control System: 13 intersections on Santa Barbara & Golden Gate Pkwy	4463421	$ 893,000	PE 2023/24 CST 2024/25				
91st Ave N (Construction of a 5' wide sidewalk along the south side of the road)							
Vanderbilt Beach Road Corridor Study							
ITS Vehicle Detection Update/Installation at Signalized Intersections in Collier County							
ITS ATMS Retiming of Arterials							

Appendix A: School Congestion Matrix.

Network Congestion Management Strategies for Schools in Collier County with High Traffic Congestion

ROAD NETWORK CONGESTION MANAGEMENT STRATEGIES			
RESULTS		• **Reduces congestion** • **Lowers motor vehicle speeds in school zones** • **Improves pedestrian and bicyclist safety**	
EXAMPLES		**Circulation Improvement:** - Evaluate and optimize traffic signals around school dismissal times - Evaluate pedestrian signal timing (crossing and wait times) - Evaluate the street network to optimize routing to and from school sites	**Infrastructure Tools:** - Traffic calming measures (curb extensions, chicanes, lateral shifts, roundabouts, etc.) - Traffic control devices (traffic signals, variable message signs, pedestrian hybrid beacons) - Pavement markings and signage (Marked crosswalks, guidance signage, warning signage, speed feedback signage)
POTENTIAL EFFECTIVENESS OF CONGESTION MANAGEMENT STRATEGIES	**Gulf Coast High (GCH)**	**Medium**	**Low**
	Laurel Oak Elementary (LOE)	**Medium**	**Low**
	Marco Island Academy (MIA)	**Low**	**Low**
	Naples High (NHS)	**High**	**Medium**
	North Naples Middle (NNM)	**Medium**	**Low**
	Oakridge Middle School (OMS)	**Medium**	**Medium**
	Pelican Marsh Elementary (PME)	**Medium**	**Medium**
	Palmetto Ridge High (PRH)	**Medium**	**Low**
	Pine Ridge Middle (PRM)	**High**	**Medium**

SCHOOL SITE CONGESTION MANAGEMENT STRATEGIES			
RESULTS		• **Eliminates peak volume times, reducing congestion** • **Reduces congestion in drop-off and pick-up areas**	
EXAMPLES		**Site-Design:** - Establish off-site waiting lots and curbing and parking zones - Designate separate entrances and additional entrances for different modes of travel (bus, drop-off/ pick-up, pedestrians/ bicyclists) - Establish a priority parking and loading zone for carpool vehicles - Provide a pull-through lane to the left side of the on-site drop-off zones to permit passing	**Demand scheduling:** - Stagger dismissal times - School Dismissal Automation Software (e.g. PikMyKid, School Pass)
POTENTIAL EFFECTIVENESS OF CONGESTION MANAGEMENT STRATEGIES	**Gulf Coast High (GCH)**	**Medium**	**High**
	Laurel Oak Elementary (LOE)	**High**	**High**
	Marco Island Academy (MIA)	**High**	**Medium**
	Naples High (NHS)	**Medium**	**High**
	North Naples Middle (NNM)	**Medium**	**Medium**
	Oakridge Middle School (OMS)	**High**	**Medium**
	Pelican Marsh Elementary (PME)	**High**	**Medium**
	Palmetto Ridge High (PRH)	**Low**	**High**
	Pine Ridge Middle (PRM)	**High**	**Medium**

TRANSPORTATION MODE CONGESTION MANAGEMENT STRATEGIES			
RESULTS		• **Reduces volume of vehicle traffic** • **Improves pedestrian and bicyclist safety**	
EXAMPLES		**Encouragement Solutions:** - Awareness campaign about school bus routes among eligible students - School Carpooling Apps (e.g GoKid, KiD CarPool, Carpool to School, Carpools-Kids, Zūm, Hop Skip Drive, Sheprd, Kango) - Waking/biking school bus - Walk/ride to school days	**Infrastructure Solutions:** - Fill gaps in the pedestrian and bicycle network - Path and trail connection from school to adjacent properties - Secure and convenient bicycle parking
POTENTIAL EFFECTIVENESS OF CONGESTION MANAGEMENT STRATEGIES	**Gulf Coast High (GCH)**	**High**	**Medium**
	Laurel Oak Elementary (LOE)	**High**	**Low**
	Marco Island Academy (MIA)	**High**	**Low**
	Naples High (NHS)	**High**	**High**
	North Naples Middle (NNM)	**High**	**Low**
	Oakridge Middle School (OMS)	**High**	**Medium**
	Pelican Marsh Elementary (PME)	**High**	**Medium**
	Palmetto Ridge High (PRH)	**High**	**Low**
	Pine Ridge Middle (PRM)	**High**	**Low**

Appendix B: Congestion Management Process Implementation Matrix

PLACEHOLDER PAGE FOR IMPLEMENTATION MATRIX

Appendix C: Congestion Management Committee Strategy Evaluation Criteria

Congestion Management Committee Evaluation Criteria and Scores

A. Pre-Project Evaluation

Q1 – Does this project address a congested roadway?

- Yes
- No

B. General Project Evaluation

Q2 – Is this application supported by multiple jurisdictions?

- Yes – 3 pt.
- No (blank) – 0 pt.

Q3 – Are there specific technical and/or monetary local contributions for this project?

- Yes – 3 pt.
- No – 0 pt.

Q4 – Does this project require the acquisition of right-of-way?

- Yes – 0 pt.
- No – 3 pt.

C. Project Specific Evaluation:

Q5 - Uses TSM Approach?

- High – 5 pts. – Incorporates intersection improvements such as turn lanes, signal improvements etc.; or significantly enhances operational response time for emergency vehicles on intersections/facilities which have an existing Level of Service (LOS) " F"
- Med – 3 pts. – Incorporates intersection improvements such as turn lanes, signal improvements, etc.; or significantly enhances operational response time for emergency vehicles on intersections/facilities which have an existing LOS "E"
- Low – 1 pt.- incorporates intersection improvements such as turn lanes, signal improvements, etc.; or establish and/or improves traffic diversion capability on intersections/facilities (for example signage for alternative routes) which have an existing LOS "D"

Q6 - Uses TDM strategy?

- High – 5 pts. – Reduces congestion and increases efficiency of the system by adding a new a transit route or a new park & ride facility or cooperating with regional TDM program
- Med – 3 pts. – Reduces congestion and increases system efficiency by increasing existing carpooling, vanpooling, transit or a park & ride facility.
- Low – 1 pt. – Reduces congestion and increases system efficiency by adding new bicycle or pedestrian facilities

Q7 - Supports/enhances and effectively integrates with existing ITS and maintains concurrency with FDOT Regional ITS Architecture and technological advances in TOC equipment and operations?

- High – 5 pts. – Project affects arterial roadways; or addresses a critical need due to insufficient communication and/or system expansion
- Med – 3 pts. – Project affects collector roadways; or addresses a critical need
- Low – 1 pt. – Project location is not specific; or project is to address contingency system backup or to purchase miscellaneous equipment

Q8 - Increases Security?

- Yes – 3 pt.
- No (blank) – 0 pt.

Q9 - Increases Safety?

- High – 5 pts. – Addresses a documented safety problem; reduces the total number of vehicle-related crashes or serious injuries; reduces the total number of bicycle-related or pedestrian related crashes; reduce the number of transit related injuries
- Med – 3 pts. – Increases bicycle or pedestrian safety at high traffic location; and/or increases/improves safety of emergency responders at incident sites; or to reduce the number of secondary incidents as a result of a primary incident

Q10 - Promote Regional Connectivity?

- High – 5 pts. – Enhances the inter-county connectivity of highways or transit
- Med – 3 pts. – Enhances the inter-county connectivity of pathways/bikeways/trails
- Low – 1 pt. – project is on a facility identified on the regional network

Q11 - Promotes Multi-Modal Solutions?

- High – 5 pts. – Improves at least three modes; increases connectivity between motorized and non-motorized modes; advances recommendations from existing MPO Bicycle/Pedestrian Safety Studies, Audits, and Community Walkability Studies
- Med – 3 pts. – Enhances at least two modes of transportation
- Low – 1 pt. – Improves one mode; increases transit ridership on a specific route; increases transit enhancements such as park and ride lots or bus shelters; and other enhancements for non-motorized facilities etc.

Q12 - Protect Environmental Resources?

- High – 5 pts. – Reduces air quality emissions; reduces fuel consumption by reducing corridor congestion
- Med – 3 pts. – Reduces fuel consumption by reducing specific intersection delays; improves monitoring and reporting capability
- Low – 1 pt. – Supports general congestion avoidance measures

Q13 - Promotes Economic Development or Freight Movement?

- High – 5 pts. – Project is located at and directly affects access to airports, major activity centers, or freight activity centers
- Med- 3 pts. – Project is located near and affects access to, airports, high employment areas, or freight activity centers
- Low – 1 pt. – Project is not located near to airports, or high employment areas but can promote overall economic development of the community

Appendix D: Congestion Management Process Project Application Submittal Form

PLACEHOLDER PAGE FOR APPLICATION FORM

Congestion Management Process Update

Congestion Management Committee

January 19, 2022

Tindale Oliver is now benesch

1

Today's Agenda

- Introductions
- CMP Update Schedule Overview
- 2022 CMP Document Update:
  - CMP Process
  - Changes from 2017 Update
  - Organization of Revised Report
- Next Steps
- Requested Actions

Tindale Oliver is now benesch

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2022 CMP Document Update

What is a CMP?

- Ongoing 8-step process for improving transportation system performance by reducing traffic congestion impacts
- Federally required for MPOs with a population greater than 200,000
- Provides a framework for the approach, process, and analysis in the form of a guidance document

Congestion Management Process
8-Step Framework

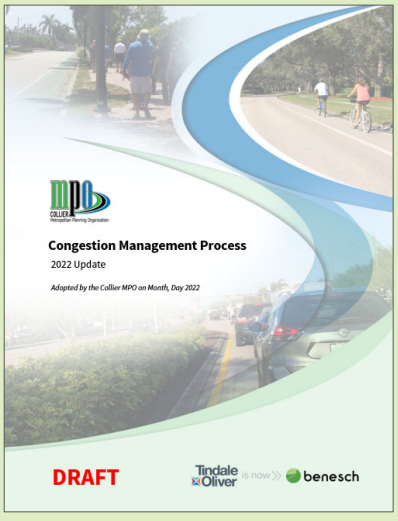
Tindale Oliver is now benesch

3

2022 CMP Document Update

Changes from 2017 CMP Update

- Incorporates recommendations from 2020 TSP Baseline Conditions Report and Action Plan:
  - Objectives and performance measures
  - Congestion management Strategies
  - Strategy evaluation criteria and effectiveness monitoring
- Revised look and graphic elements
- New organization to incorporate TSP reporting and better define the Process



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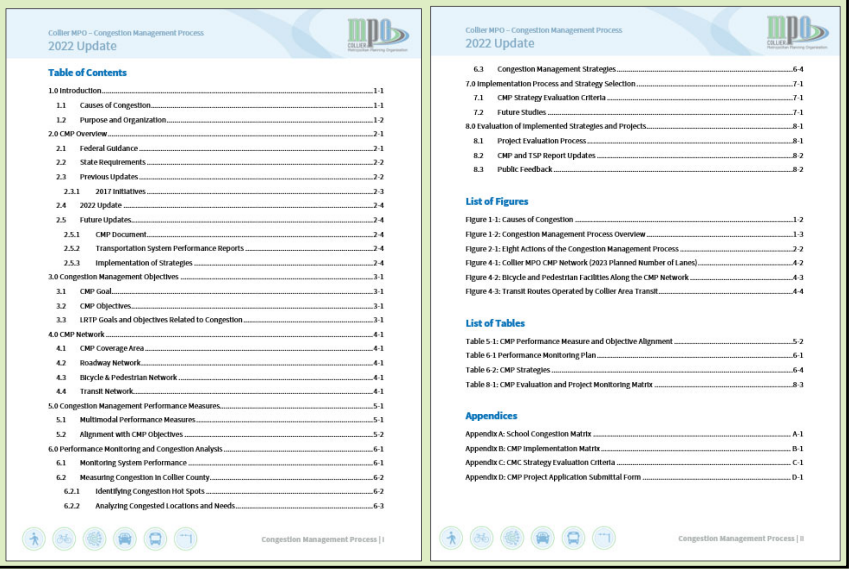
2022 CMP Document Update

Organization of 2022 CMP Document

- Chapters 3 through 8 follow and reference the 8 steps from federal guidance
- Tables and appendices contain practical tools, matrices, and forms used in the process by the MPO, CMC, and partner agencies



Collier MPO – Congestion Management Process
2022 Update

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Collier MPO – Congestion Management Process
2022 Update

List of Figures

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Appendices

Congestion Management Process | II

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2022 CMP Document Update

1. Develop Regional Objectives
2. Define CMP Network
3. Develop Multimodal Performance Measures
4. Collect Data/Monitor System Performance
5. Analyze Congestion Problems and Needs
6. Identify and Assess Strategies
7. Program and Implementation Strategies
8. Evaluate Strategy Effectiveness

Action (Chapter)	Addressed By	When
Action #1 (Chapter 3)	TSP / CMP Report Updates	At Least Every 5 Years or As Needed
Action #2 (Chapter 4)	TSP Reports	Should Coincide with 5-yr LRTP or Annual TIP Updates
Action #3 (Chapter 5)	TSP / CMP Report Updates	At Least Every 5 Years or As Needed
Actions #4 & 5 (Chapter 6)	TSP Reports & Performance Monitoring Plan	Ongoing / As Needed
Actions #5 & 6 (Chapters 6 & 7)	Implementation Matrix & Strategy Evaluation Criteria	Annually to Conincide with TIP Funding Process
Action #8 (Chapter 8)	TSP Report Updates & Project Evaluation & Monitoring Matrix	Systemwide Evaluation Should Coincide with 5-yr LRTP Update; Project Evaluation Should Occur Within 1 Year of Implementation

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Next Steps

- Finalize 2022 CMP Update Report for MPO Board adoption
- Evaluate travel conditions along congested corridors
- Present preliminary results of evaluation and recommendation for corridor consolidation into Top 10 for fact sheets at next CMC meeting

Upcoming 2022 CMC Meeting Topics	
March 16	• Corridor Evaluation Results
May 18	• Draft Summaries with Potential Strategies for Top 10 Corridors • Methodology for Countywide O&D Analysis
July 20	• Countywide O&D Analysis Results • Top 10 Corridor Summary Fact Sheets

Tindale Oliver is now benesch

7

Today's Requested Actions

For the Committee to:

- Approve the 2022 CMP Update Report and recommend for adoption by MPO Board based on review and discussion.

Tindale Oliver is now benesch

8

Contact

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Brandy.otero@colliercountyfl.gov

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EXECUTIVE SUMMARY
COMMITTEE ACTION
ITEM 7C

Endorse Congested Corridors Evaluation Methodology

OBJECTIVE: For the committee to endorse the proposed methodology for evaluating travel conditions along congested corridors.

CONSIDERATIONS: The first Biennial Transportation System Performance (TSP) Report was approved by the MPO Board in September 2020 as called for in the MPO's Congestion Management Process (CMP). As part of the ongoing review of congestion and public engagement activities of the MPO, the consultant scope for updating the CMP approved by the MPO Board includes developing corridor level fact sheets of the Tier 1 and Tier 2 congestion locations.

The consultant will brief the CMC on the methodology used to reduce the 15 Tier 1 and Tier 2 segments into 10 corridors for developing summaries.

Additionally, the presentation will provide the committee with an overview of the potential data sources and the consultant's recommended methodology for reporting travel reliability, speed, congestion bottlenecks, and users on the corridor fact sheets. The CMC will review the proposed methodology and provide feedback prior to the analysis being completed. Once a methodology has been agreed upon, the consultant will prepare results for these data sources and provide an update to the CMC at a future meeting. A copy of the consultant's presentation has been included as **Attachment 1.**

STAFF RECOMMENDATION: Endorse the proposed methodology for evaluating travel conditions along congested corridors based on review and discussion.

Prepared By: Brandy Otero, Collier MPO Principal Planner

ATTACHMENT(S):

1. Consultant Presentation

Congested Corridors Evaluation Methodology

Congestion Management Committee

January 19, 2022

Tindale Oliver is now benesch

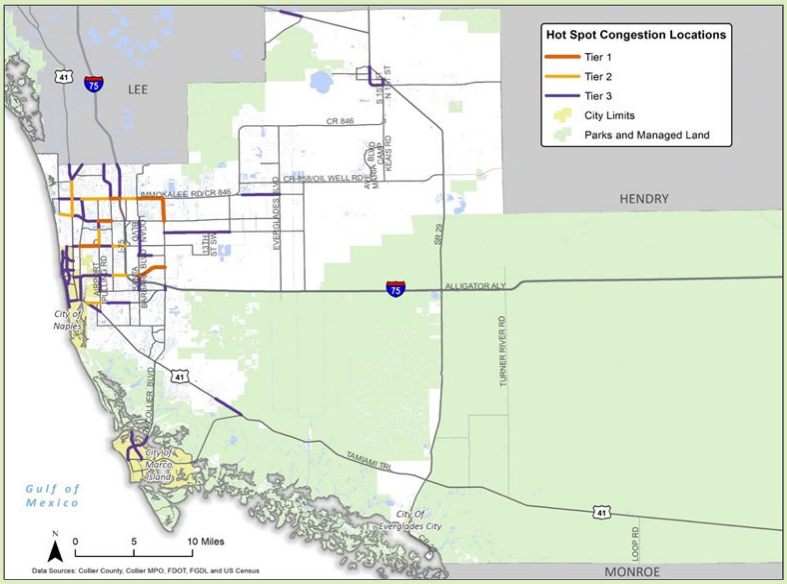
1

Congested Corridors Evaluation

Tier 1 & 2 Hot Spot Congested Corridors

Tier 1 Locations
Immokalee Rd from Livingston Rd to I-75
Immokalee Rd from Logan Rd to CR 951
CR 951 from Vanderbilt Beach Rd to Immokalee Rd
Vanderbilt Beach Rd from Airport-Pulling Rd to Livingston Rd
Pine Ridge from Goodlette Frank Rd to Airport-Pulling Rd
Golden Gate Parkway from Santa Barbara Blvd to CR 951

Tier 2 Locations
Immokalee Rd from I-75 to Logan Rd
Immokalee Rd from Goodlette Frank Rd to Livingston Rd
US 41 from Vanderbilt Beach Rd to Immokalee Rd
US 41 from Immokalee Rd to Old US 41
Vanderbilt Beach Rd from Vanderbilt Drive to US 41
Airport-Pulling Rd from Pine Ridge Rd to Orange Blossom Dr
Pine Ridge Rd from Livingston Rd to I-75
Golden Gate Pkwy from Livingston Rd to I-75
Davis Blvd from US 41 to Airport-Pulling Rd



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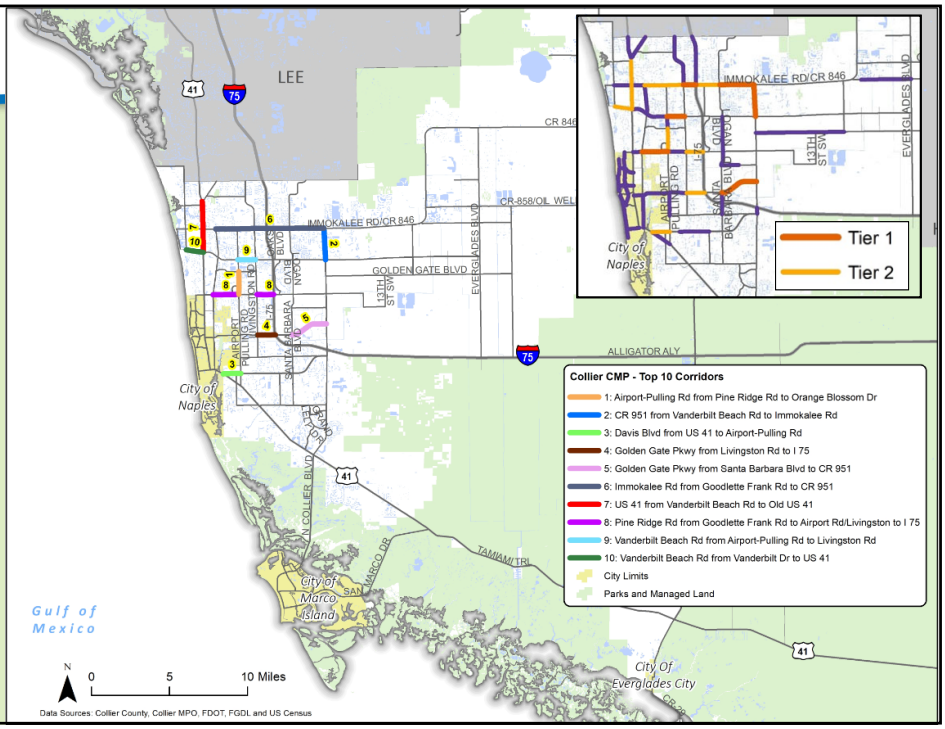
Proposed Consolidation

- All 15 original corridors into a new Top 10
- Based on common roadways
- Allows all Tier 1 & Tier 2 corridors to be included in summary fact sheets



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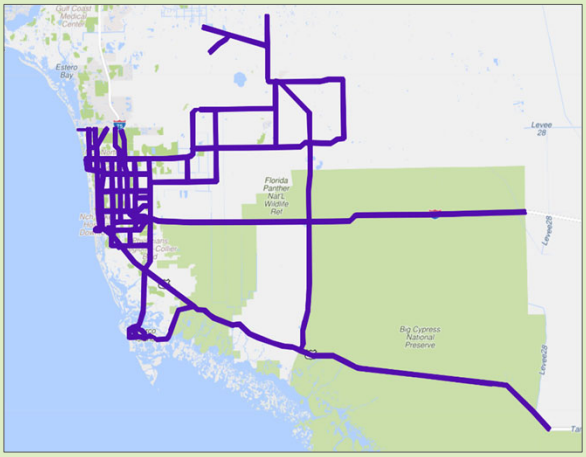
Congested Corridors Evaluation

Proposed Methodology Overview

- Data sources and metrics:
  - RITIS/HERE - Travel time, avg. speed, congestion %, bottleneck locations
  - Replica - Trip purpose
  - FDOT - # of lanes, AADT, VMT
- Year: Most recent full year (2021)
- Other considerations:
  - Time of day (peak vs. off-peak)
  - Day of the week (weekday vs. weekend)
  - Time of year (seasonality/visitors)
- All Tier 1 and Tier 2 corridors are covered by HERE dataset

HERE Roadway Network Coverage in Collier County



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Congested Corridors Evaluation

Proposed Usage of Data Sources & Metrics

RITIS

- Average travel time, speed, and congestion % data for identifying roadway performance conditions along entire corridor or specific segments by time of day, week, and year
- Bottleneck data for identifying locations and severity of recurring congestion (queue length, duration, delay time)

Replica

- Trip purpose and mode share information to be used in eventual congestion strategy recommendations

FDOT

- Supplemental data to be used along with aerial imagery for additional information on roadway characteristics or more accurate volumes on available roadways

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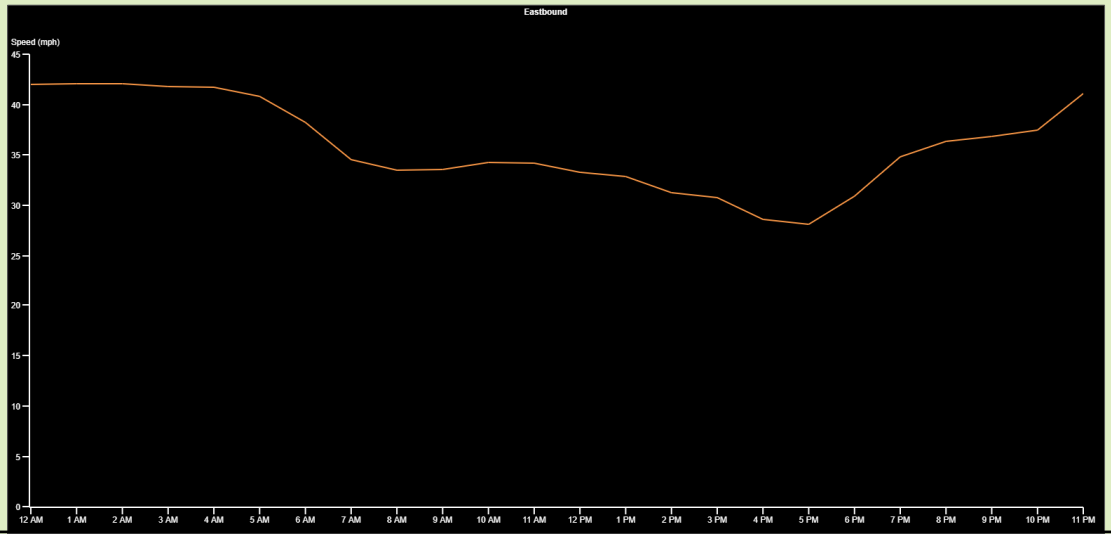
Data Output & Visualization Examples

RITIS Travel Time and Speed Graphs – Peak/Off-Peak Patterns



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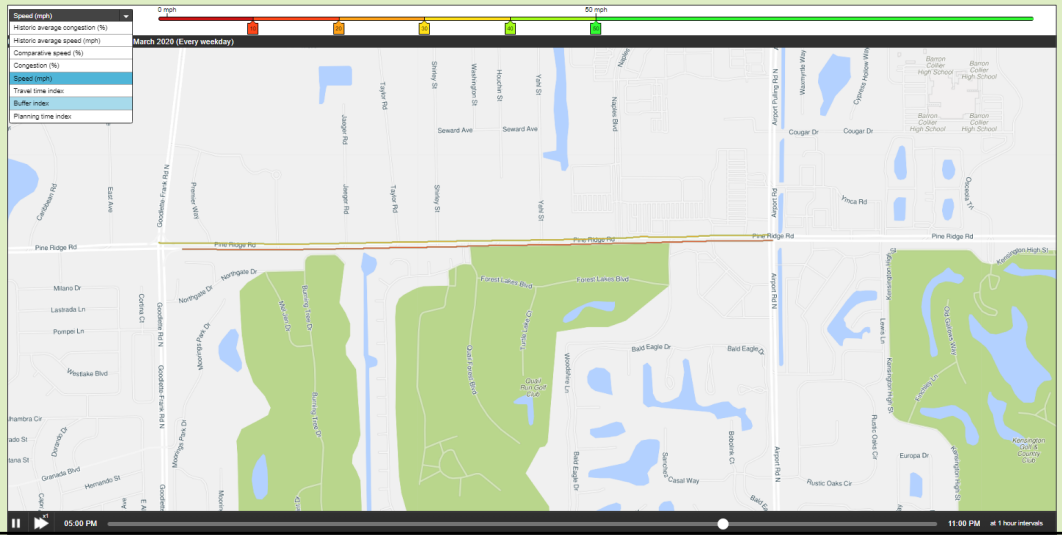
Data Output & Visualization Examples

RITIS Trend Map – Time of Day and Location of Congestion



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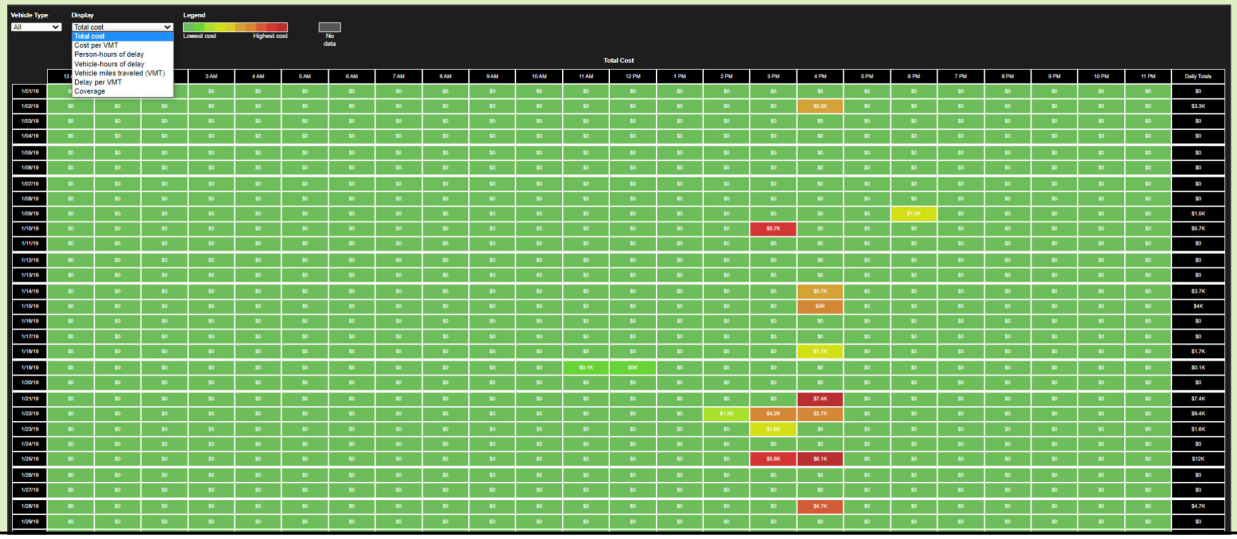
Data Output & Visualization Examples

RITIS Delay Tool – Annual/Seasonal Patterns



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Data Output & Visualization Examples

RITIS Excel Outputs – Customized Analysis of Various Metrics

Miles	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM
0.675648	100.0	100.0	100.0	100.0	100.0	100.0	98.6	81.86	84.83	92.29	100.0	100.0	100.0	100.0	100.0	94.13	82.7	78.63	85.41	100.0	100.0	100.0
0.118517	100.0	100.0	100.0	100.0	100.0	100.0	98.6	81.86	84.83	92.29	100.0	100.0	100.0	100.0	100.0	94.13	82.7	78.63	85.41	100.0	100.0	100.0
2.549452	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.6	98.3	93.99	87.05	95.24	100.0	100.0	100.0
1.412109	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.09	93.53	95.09	94.75	93.03	88.88	82.04	63.01	65.09	54.17	46.69	59.83	83.49	95.26	99.56
3.039381	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.76	87.7	86.61	87.56	88.87	87.41	85.65	82.74	79.43	73.04	79.13	86.18	93.09	95.83	98.24
2.245187	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.24	96.9	96.13	96.59	95.6	95.89	94.12	92.91	91.0	95.7	97.55	99.78	100.0	100.0
0.033749	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	92.0	89.63	88.8	88.08	87.13	86.8	87.15	87.25	87.74	88.75	91.2	92.99	93.44	94.03
1.947877	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	92.0	89.63	88.8	88.08	87.13	86.8	87.15	87.25	87.74	88.75	91.2	92.99	93.44	94.03

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Data Output & Visualization Examples

Replica Trip Purpose & Distance – Cause & Strategy Assessment

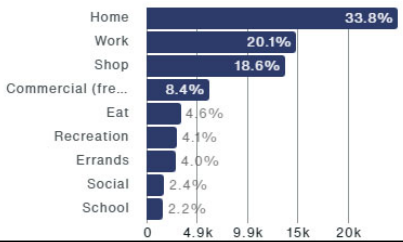
All purposes

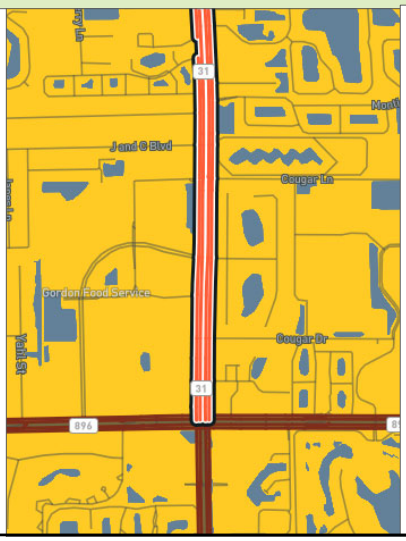
Download

Most common trip purpose

33.8% – Home

Number of trips for each purpose





All distances

Download

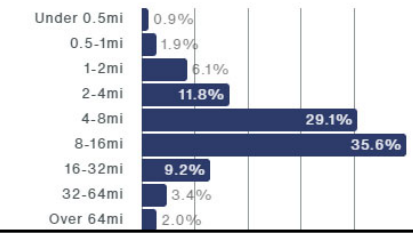
Average trip distance

12.1 mi

Median trip distance

7.8 mi

Number of trips by total distance traveled



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Today's Requested Actions

For the Committee to:

- Endorse the proposed methodology for evaluating travel conditions along congested corridors based on review and discussion.

Tindale Oliver is now benesch

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Contact

Wally Blain, AICP
Benesch Project Manager
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OR

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Brandy.otero@colliercountyfl.gov

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EXECUTIVE SUMMARY
COMMITTEE REPORTS & PRESENTATIONS
ITEM 8A

Collier Area Transit (CAT) - Transit Signal Priority & Automatic Vehicle Location System Update

---

OBJECTIVE: For the committee to receive a status update on the CAT Transit Signal Priority and Automatic Vehicle Location (AVL) System project.

CONSIDERATIONS: At the September 15, 2021, CMC meeting, County Public Transportation and Neighborhood Enhancement Division (PTNE) staff informed the committee that the Transit Signal Priority and Automatic Vehicle Location System project was out for solicitation. The project enhances the region's transportation network by integrating CAT's transit signal priority system improvements with their Automatic Vehicle Location (AVL) system infrastructure to improve transit operations. PTNE staff will provide a brief status update on the project at the January meeting.

STAFF RECOMMENDATION: That the committee receive a status update on the CAT Transit Signal Priority and AVL System project.

Prepared By: Scott Philips, Collier MPO Principal Planner

EXECUTIVE SUMMARY
COMMITTEE REPORTS & PRESENTATIONS
ITEM 8B

FDOT District 1 - US 41 FRAME Presentation

OBJECTIVE: For the committee to receive a presentation regarding the FDOT District 1 Florida's Regional Advanced Mobility Elements (FRAME) project on US 41 in Lee County.

CONSIDERATIONS: The Florida's Regional Advanced Mobility Elements (FRAME) project is part of FDOT's larger initiative to deploy Connected Vehicle (CV) technology on Florida's roadways to better manage, operate, and maintain the multi-modal system, create integrated corridor management solutions, and improve safety and mobility. Emerging technologies proposed in the FRAME program include Automated Traffic Signal Performance Measures and CV technologies such as Roadside Units and On-Board Units; Transit Signal Priority and Freight Signal Priority to facilitate the operation of Signal Phase and Timing; Traveler Information Messages; Emergency Vehicle Preemption; and other applications. The goal of the project is to improve existing facilities and promote a more effective and efficient transportation network.

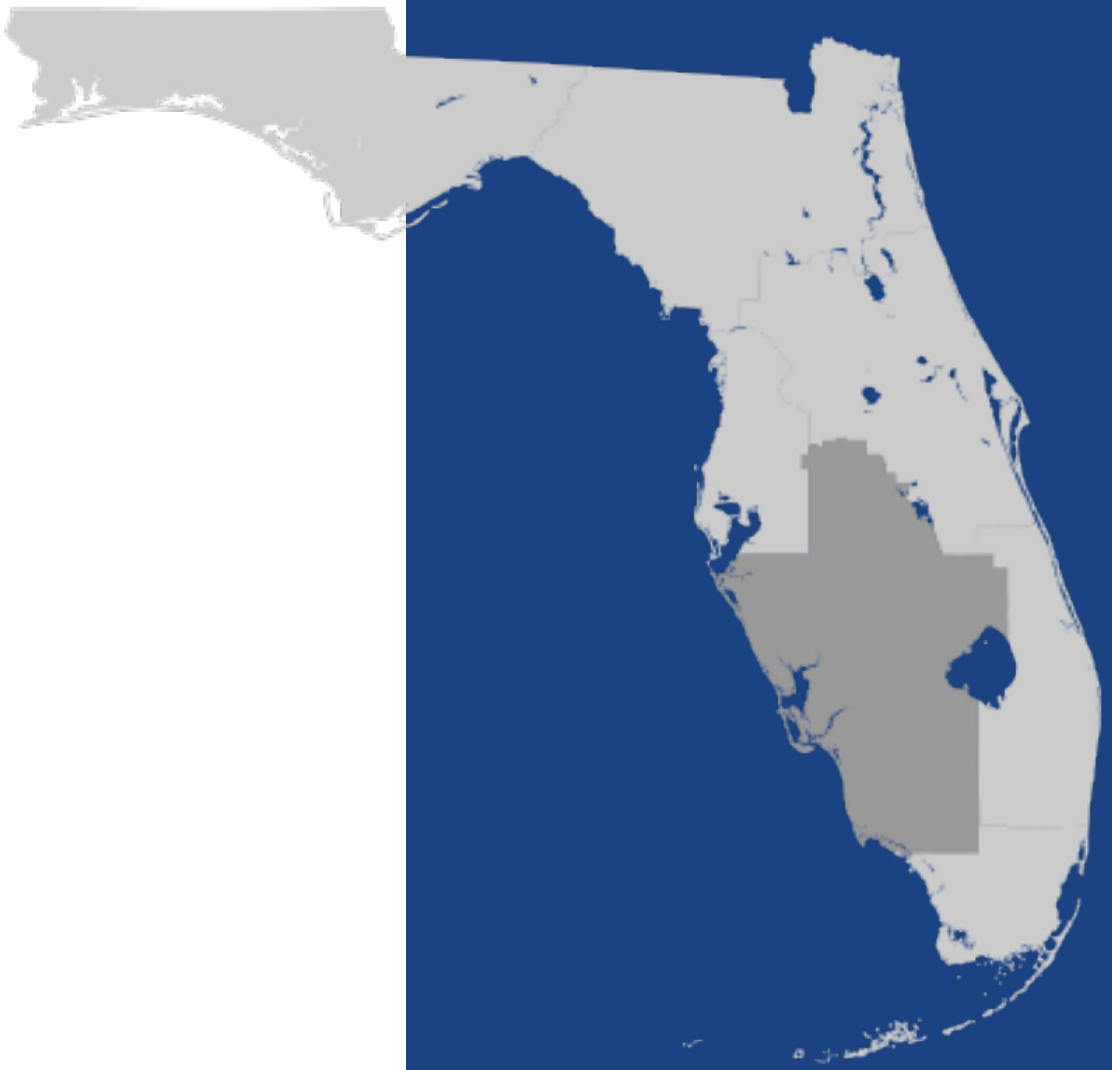
The US 41 FRAME project will deploy emerging safety and mobility solutions such as Automated Traffic Signal Performance Measures (ATSPM) and Connected and Automated Vehicles (CAV) solutions on US 41 in Lee County with the goal of improving safety and mobility along the corridor.

STAFF RECOMMENDATION: That the committee receive a presentation from FDOT on the FRAME project on US 41 in Lee County.

Prepared By: Scott Philips, Principal Planner Collier MPO

ATTACHMENT(S):

1. FDOT District 1 US 41 FRAME Presentation



PROJECT UPDATE

FDOT District One
US 41 FRAME

US 41 FRAME Project Details

- Part of Florida's Regional Advanced Mobility Elements (FRAME)
  - Deployment of CV Technology (RSUs, OBUs, LiDAR, CV Applications)
- Segment length: 6.44 miles in Lee County
- 25 signals
  - Interconnected & closely spaced, half-mile
  - Lee County has mostly ASC 3 (TS2, 1) and Cobalt's (ATC/TS2, 1)
- US 41 is parallel to I-75
  - Detour route for incident management

Project Approach

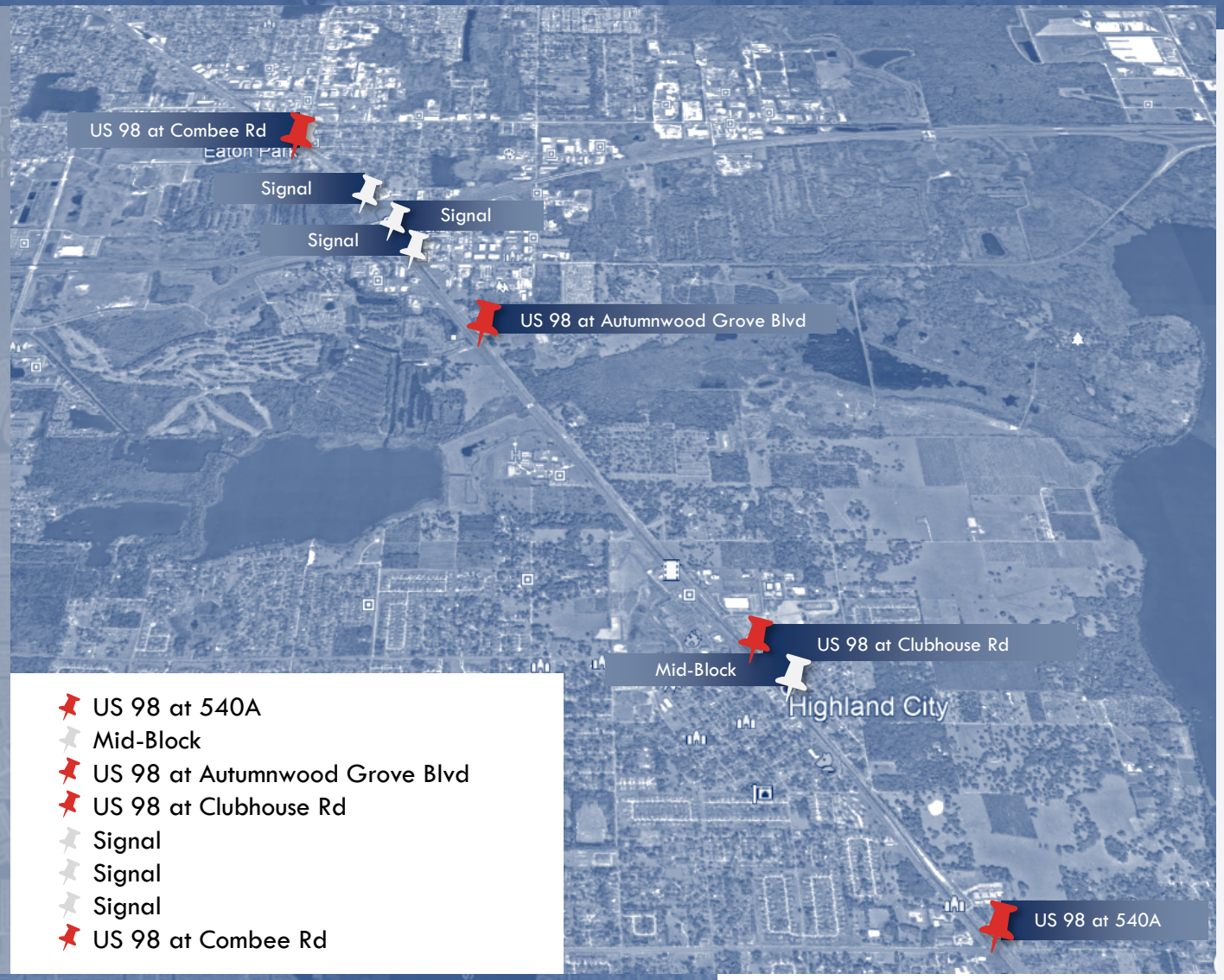
- Systems Manager uses the same consultant to:
  - Create all Systems Engineering documentation
  - Provide full design services
  - Assist with procurement as needed
  - Perform integration and testing
- The contractor installs all infrastructure
- This allows FDOT to have more flexibility in the choice of technology
- Lee County will operate and maintain

GOAL: IMPROVE SAFETY AND MOBILITY

Stakeholders

- FDOT District One
- Lee County
  - Sherriff's Department
  - Engineering Department
  - Department of Public Safety
- LeeTran
- Emergency Services Agencies
- Auto Dealers (15 within our project limits)
- City of Fort Myers
  - Fire Department
  - Police Department
  - Engineering Division

US 41 FRAME Project Details



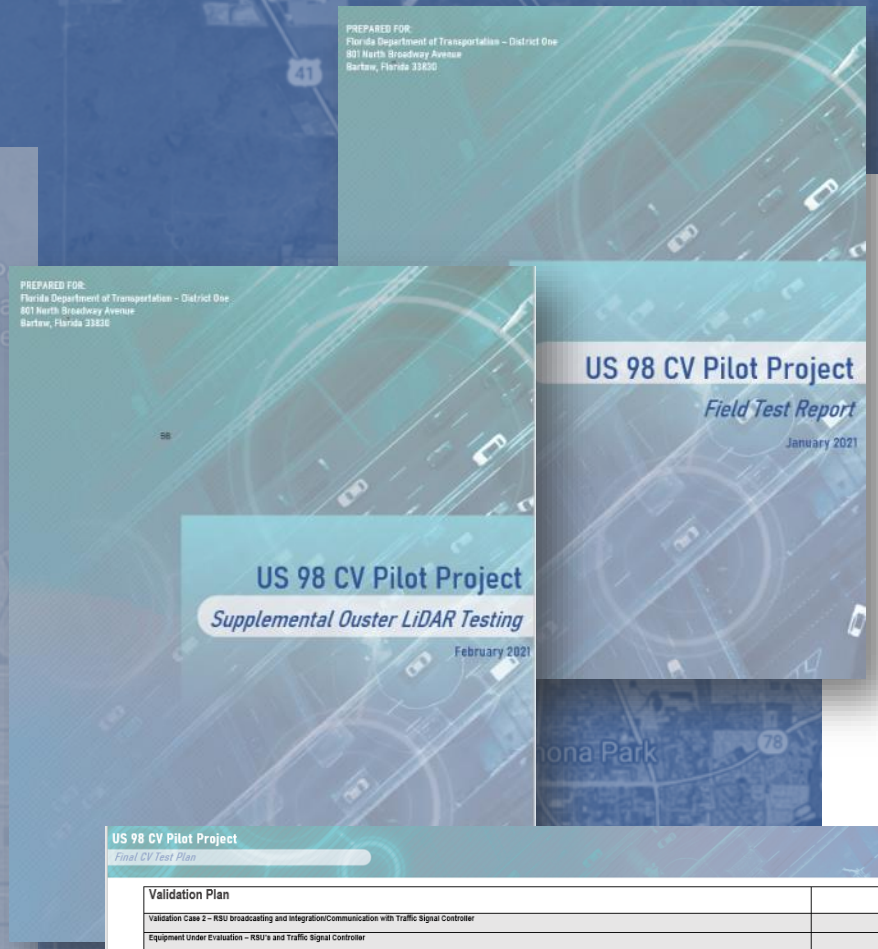
FOUR TESTED CV PILOT LOCATIONS

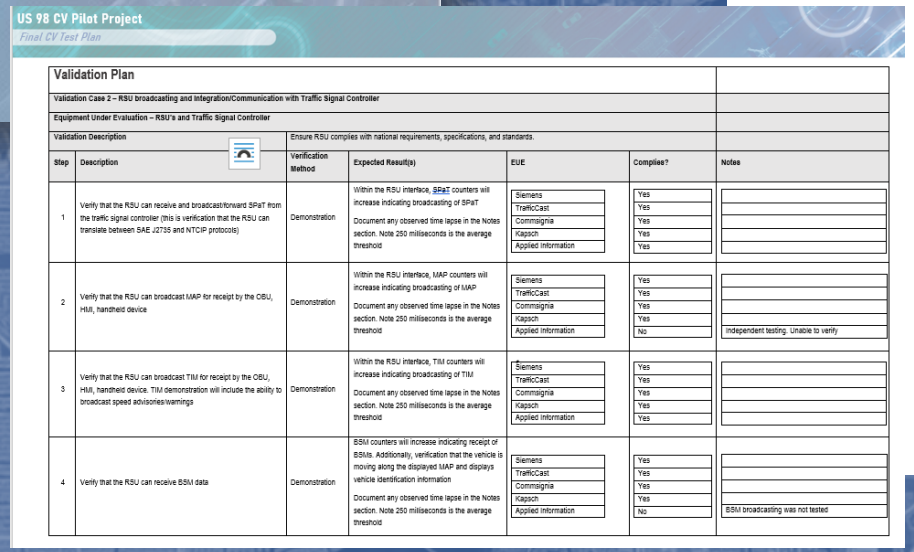
1. US 98 at CR 540A
2. US 98 at Clubhouse Rd
3. US 98 at Autumnwood Grove Blvd
4. US 98 at Combee Rd

CV APPLICATIONS

- Signal Phase & Timing (SPaT)
- Map Data Message (MAP)
- Traveler Information Message (TIM)
- Personal Safety Message (PSM)
- Transit Signal Priority (TSP)
- Emergency Vehicle Pre-emption (EVP)

US 41 FRAME Project Details





US 98 CV PILOT TESTING RESULTS REPORT

- Documented observations of testing relative to performance, communication, vendor support – 2 Reports:
  - US 98 CV Pilot Test Report
  - Supplemental Ouster Report
- Includes summary matrices/validation plans
- Includes device deployment recommendations

US 98 CV PILOT TESTING RESULTS

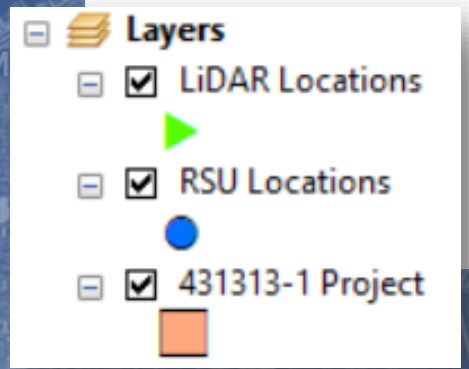
- ***Recommendation:***
  - Kapsch Dual-Mode RSUs – Qty 25
  - Kapsch C-V2X OBUs – Qty 11
  - Commsignia C-V2X OBU for interoperability – Qty 1
  - Connect:ITS In-cabinet processor – Qty 11
  - Ouster LiDAR – Qty 22

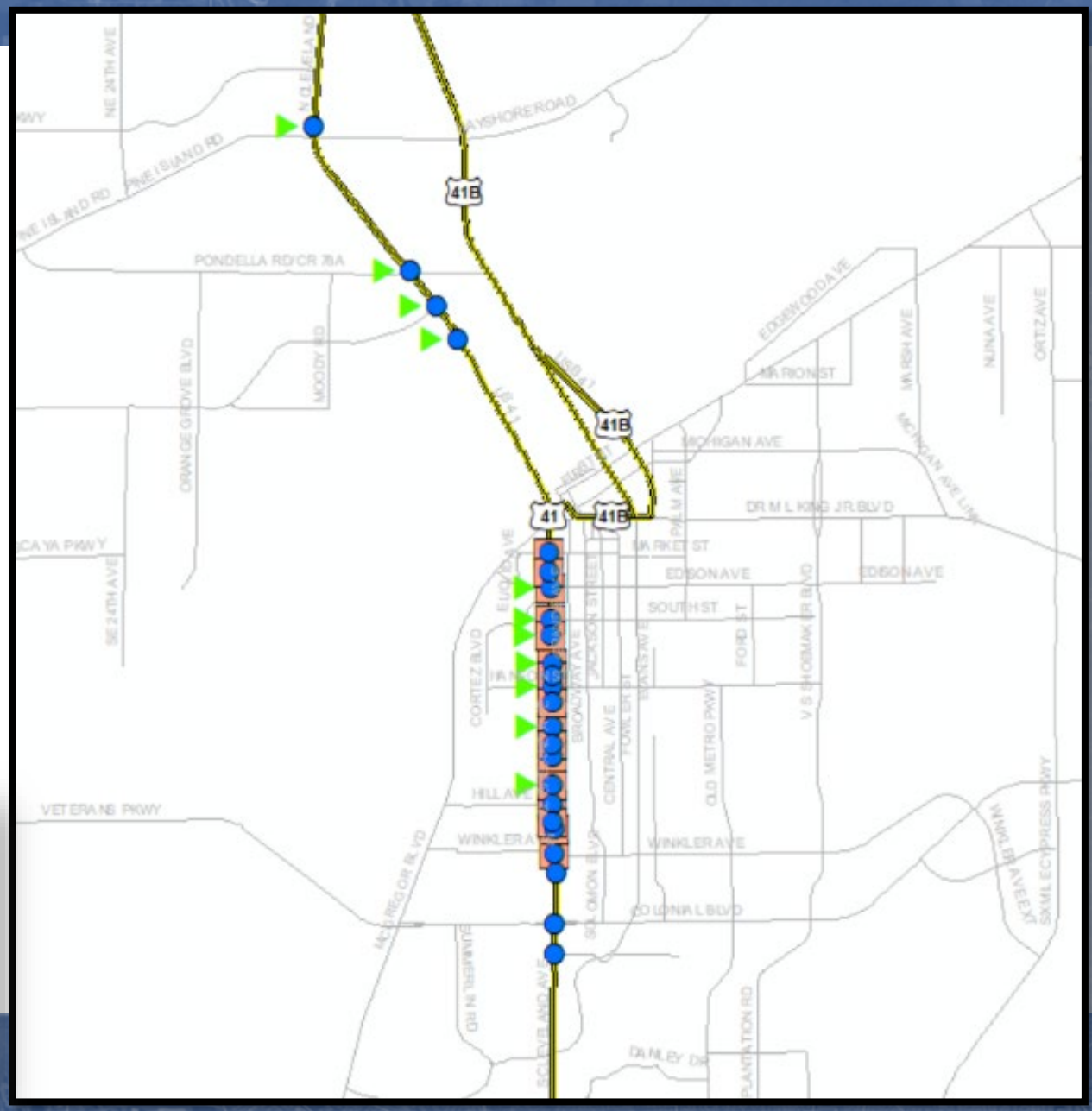
US 41 FRAME Project Details

- Project Details
- System Engineering
- Evaluation of CV
- Procurement Analysis
- Conclusion
- Next Steps

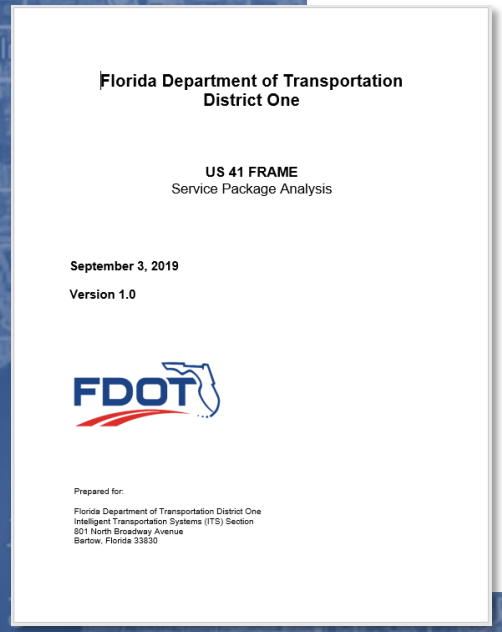
Plans Development

- Final S&S plans Completed in July 2021
- Coordinating with adjacent projects, specifically with project 431313-1. This project is installing infrastructure that will be used by our project





US 41 FRAME System Engineering



Florida Department of Transportation
District One

US 41 FRAME
Service Package Analysis

September 3, 2019

Version 1.0

FDOT

Prepared for:

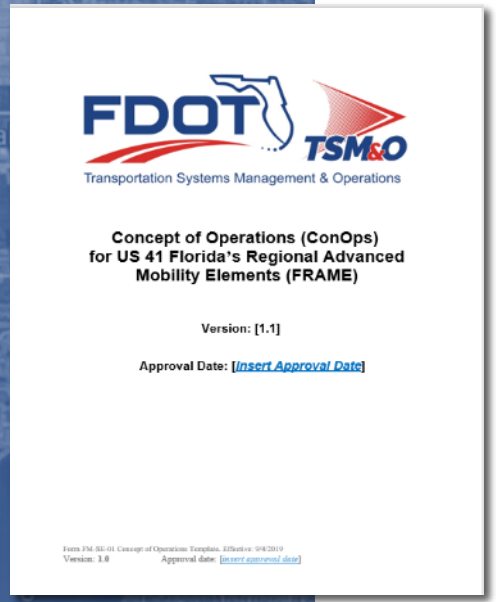
Florida Department of Transportation District One
Intelligent Transportation Systems (ITS) Section
801 North Broadway Avenue
Bartow, Florida 33830

Service Package Analysis

- Analyzed the Service Packages currently in use
  - FDOT District One
  - Lee County Government
- Recommended additional Service Packages
  - Increased safety benefits by CV technology

- AD1 - ITS Data Mart
- APTS07 - Multi-modal coordination
- APTS08 - Transit Traveler Information
- APTS11 - Multimodal Connection Protection
- ATIS02 - Interactive Traveler Information
- ATIS04 - Dynamic Route Guidance
- ATIS10 - Short Range Communications Traveler Information
- ATMS19 - Speed Warning and Enforcement
- ATMS24 - Dynamic Roadway Warning
- ATMS26 - Mixed Use Warning Systems
- AVSS01 - Vehicle Safety Monitoring
- AVSS02 - Driver Safety Monitoring
- AVSS03 - Longitudinal Safety Warning
- AVSS04 - Lateral Safety Warning
- AVSS05 - Intersection Safety Warning
- AVSS06 - Pre-Crash Restraint Deployment
- AVSS07 - Driver Visibility Improvement
- CVO08 - On-board CVO Safety

US 41 FRAME System Engineering



Concept of Operations

- Touches on new technologies and concepts related to CV and how these technologies can be used
  - Improves the information obtained for incidents and congestion along the roadway
  - Provides information to motorists
  - Provides safer and less congested route choices
  - Discusses the current system situation
  - Provides justification for changes to the existing system
  - Provides concepts for the proposed system
  - operational scenarios
  - Lists a summary of impacts and an analysis of the proposed system

US 41 FRAME System Engineering

System Validation Plan

- Essential to ensure that stakeholders' needs are identified
- Scope/Overview of Project
- Conducting the Validation
- Event Identification
  - Activities
  - Test Results
  - Results Report


FDOT TSM&O
Transportation Systems Management & Operations

Project Systems Engineering Management Plan (PSEMP) for US 41 Florida's Regional Advanced Mobility Elements (FRAME)

Version: [1.0]

Approval Date: [Insert Approval Date]

PSEMP

- The PSEMP is a plan that helps manage and control the project
- Utilizes Systems Engineering processes
  - ***Section 1*** *– Overview of the PSEMP document*
  - ***Section 2*** *– Systems Engineering Processes*
  - ***Section 3*** *– Project Management and Control*

US 41 FRAME Evaluation of CV Applications

USDOT Sponsored CV Applications Listing

V2I Safety

Red Light Violation Warning
Curve Speed Warning
Stop Sign Gap Assist
Spot Weather Impact Warning
Reduced Speed/Work Zone Warning
Pedestrian in Signalized Crosswalk Warning (Transit)

V2V Safety

Emergency Electronic Brake Lights (EEBL)
Forward Collision Warning (FCW)
Intersection Movement Assist (IMA)
Left Turn Assist (LTA)
Blind Spot/Lane Change Warning (BSW/LCW)
Do Not Pass Warning (DNPW)
Vehicle Turning Right in Front of Bus Warning (Transit)

Agency Data

Probe-based Pavement Maintenance
Probe-enabled Traffic Monitoring
Vehicle Classification-based Traffic Studies
CV-enabled Turning Movement & Intersection Analysis
CV-enabled Origin-Destination Studies
Work Zone Traveler Information

Environment

Eco-Approach and Departure at Signalized Intersections
Eco-Traffic Signal Timing
Eco-Traffic Signal Priority
Connected Eco-Driving
Wireless Inductive/Resonance Charging
Eco-Lanes Management
Eco-Speed Harmonization
Eco-Cooperative Adaptive Cruise Control
Eco-Traveler Information
Eco-Ramp Metering
Low Emissions Zone Management
AFV Charging / Fueling Information
Eco-Smart Parking
Dynamic Eco-Routing (light vehicle, transit, freight)
Eco-ICM Decision Support System

Road Weather

Motorist Advisories and Warnings (MAW)
Enhanced MDSS
Vehicle Data Translator (VDT)
Weather Response Traffic Information (WxTINFO)

Mobility

Advanced Traveler Information System
Intelligent Traffic Signal System (I-SIG)
Signal Priority (transit, freight)
Mobile Accessible Pedestrian Signal System (PED-SIG)
Emergency Vehicle Preemption (PREEMPT)
Dynamic Speed Harmonization (SPD-HARM)
Queue Warning (Q-WARN)
Cooperative Adaptive Cruise Control (CACC)
Incident Scene Pre-Arrival Staging Guidance for Emergency Responders (RESP-STG)
Incident Scene Work Zone Alerts for Drivers and Workers (INC-ZONE)
Emergency Communications and Evacuation (EVAC)
Connection Protection (T-CONNECT)
Dynamic Transit Operations (T-DISP)
Dynamic Ridesharing (D-RIDE)
Freight-Specific Dynamic Travel Planning and Performance
Drayage Optimization

Smart Roadside

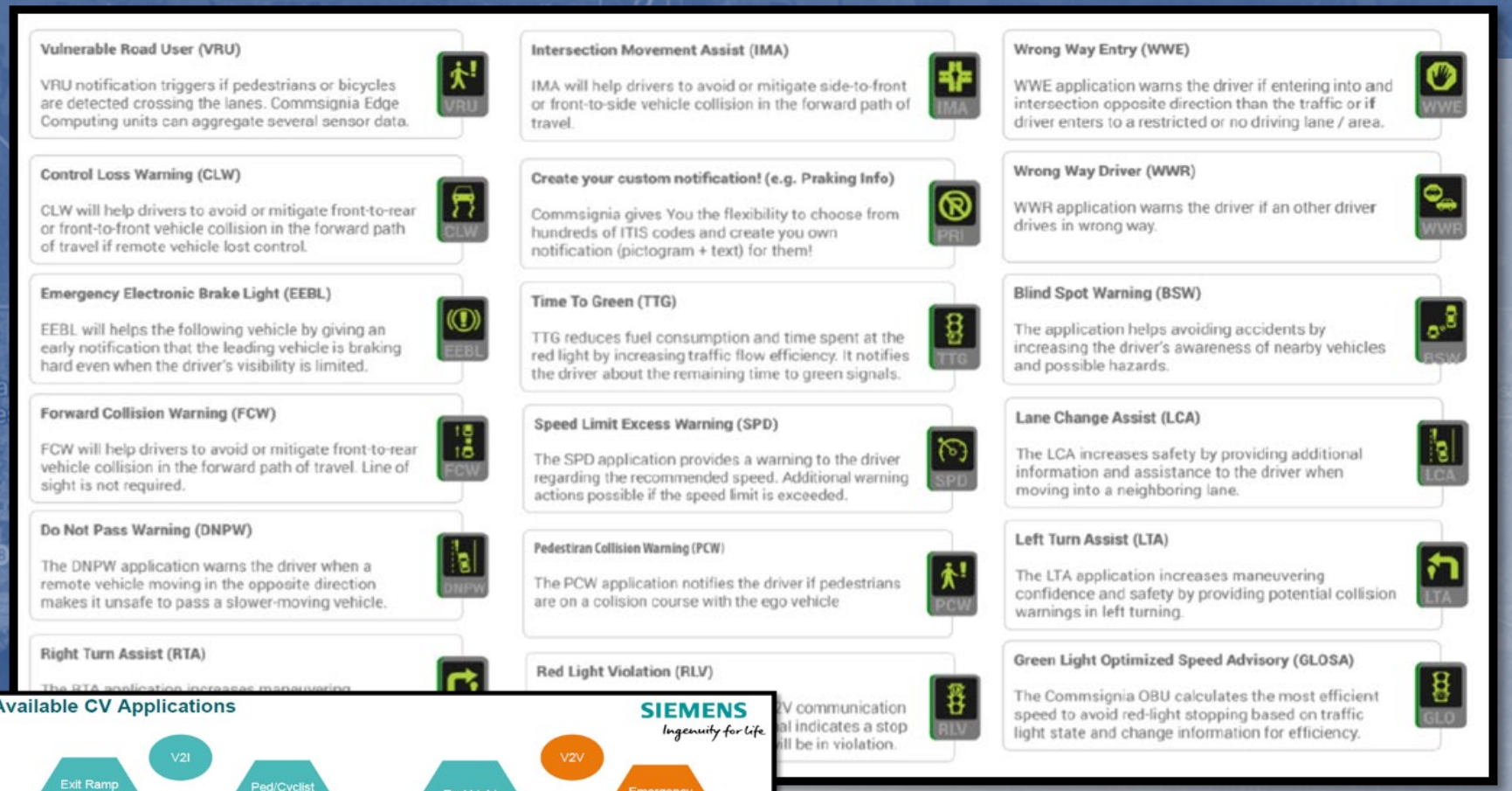
Wireless Inspection
Smart Truck Parking

CV Applications

- Vehicle-to-Infrastructure (V2I)
- Vehicle-to-Vehicle (V2V)
- Vehicle-to-Pedestrians (V2P) & Passive Pedestrian Protection/Detection

US 41 FRAME Evaluation of CV – V2X

- **Signal time to change and Red-Light Violation warning applications:**
  - SPaT and MAP signal actuation by lane
  - Advanced vehicle detection by lane
- **Priority and preemption applications:**
  - EVP
  - TSP and mobility efficiency
- **Safety Messaging:**
  - TIM creation and broadcast via RSU, OBU and Personal Safety Device (mobile application)
  - Pedestrian & Bicycle mobility and safety notifications via RSU, OBU and Personal Safety Device (mobile application)
- **Intelligent Transportation Systems Operational Data Environment (ITS ODE):**
  - SPaT, MAP, BSM and TIM data collection, management, and distribution/sharing cloud-based system



US 41 FRAME Evaluation of CV

IVP Hubs

- Solution 1 – TrafficCast
- Solution 2 – Cisco (with Quanergy LiDAR)
- Solution 3 – MH Corbin (with Cepton LiDAR, subsequent Ouster LiDAR)
- Solution 4 – Applied Information

RSUs

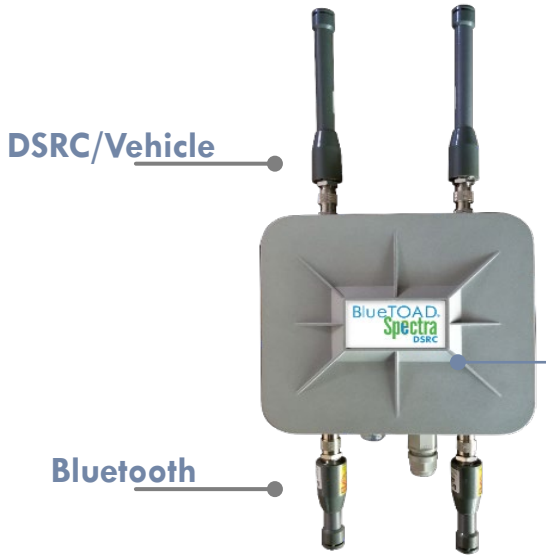
- TrafficCast DSRC (with OBU)
- Commsignia Dual-Mode (with OBU)
- Kapsch Dual-Mode (with OBU)
- Siemens Dual-Mode

Key Objectives

- CV Technology capabilities/demonstrations

US 41 FRAME Evaluation of CV

ROADSIDE UNITS (RSUs)



Commsignia (DSRC, C-V2X)

TrafficCast (DSRC)

Siemens (DSRC, C-V2X)

Kapsch (DSRC, C-V2X)

US 41 FRAME Evaluation of CV

ONBOARD UNITS (OBUs)

Commsignia ITS OB-4 (DSRC, C-V2X)

Kapsch CBX 9360 (C-V2X)

TrafficCast DENSO (DSRC)

US 41 FRAME Evaluation of CV

SENSORS – LiDAR and Camera

Quanergy M8

Cepton Vista P60

Ouster OS1

Iteris RZ4

FLIR TrafiSense 2

US 41 FRAME Evaluation of CV

INTEGRATED V2I PROTOTYPE (IVP) HUB (Industrial Computer)

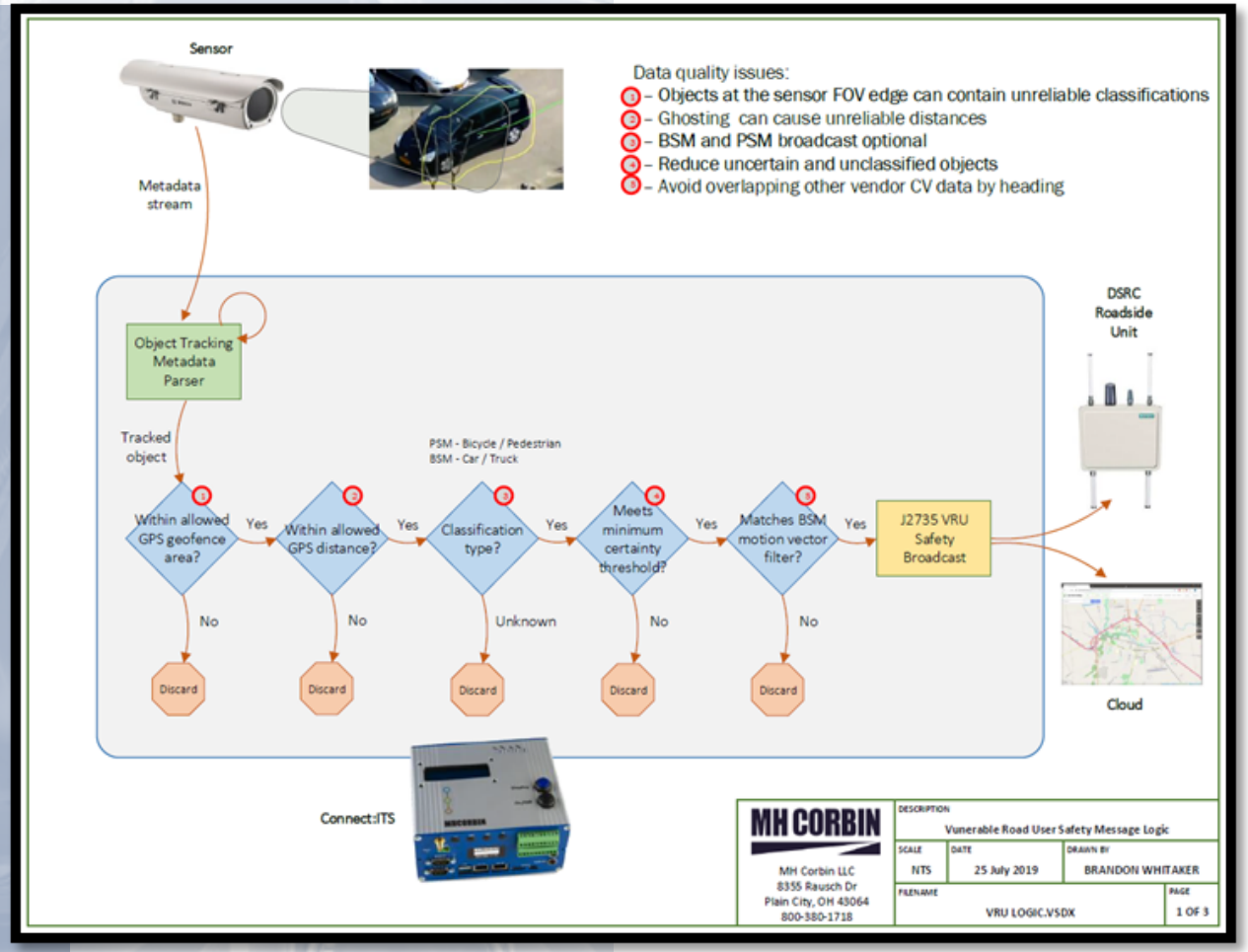
Applied Information (AI) AI-500-085

MH Corbin Connect:ITS

TrafficCast In-Cabinet Processor

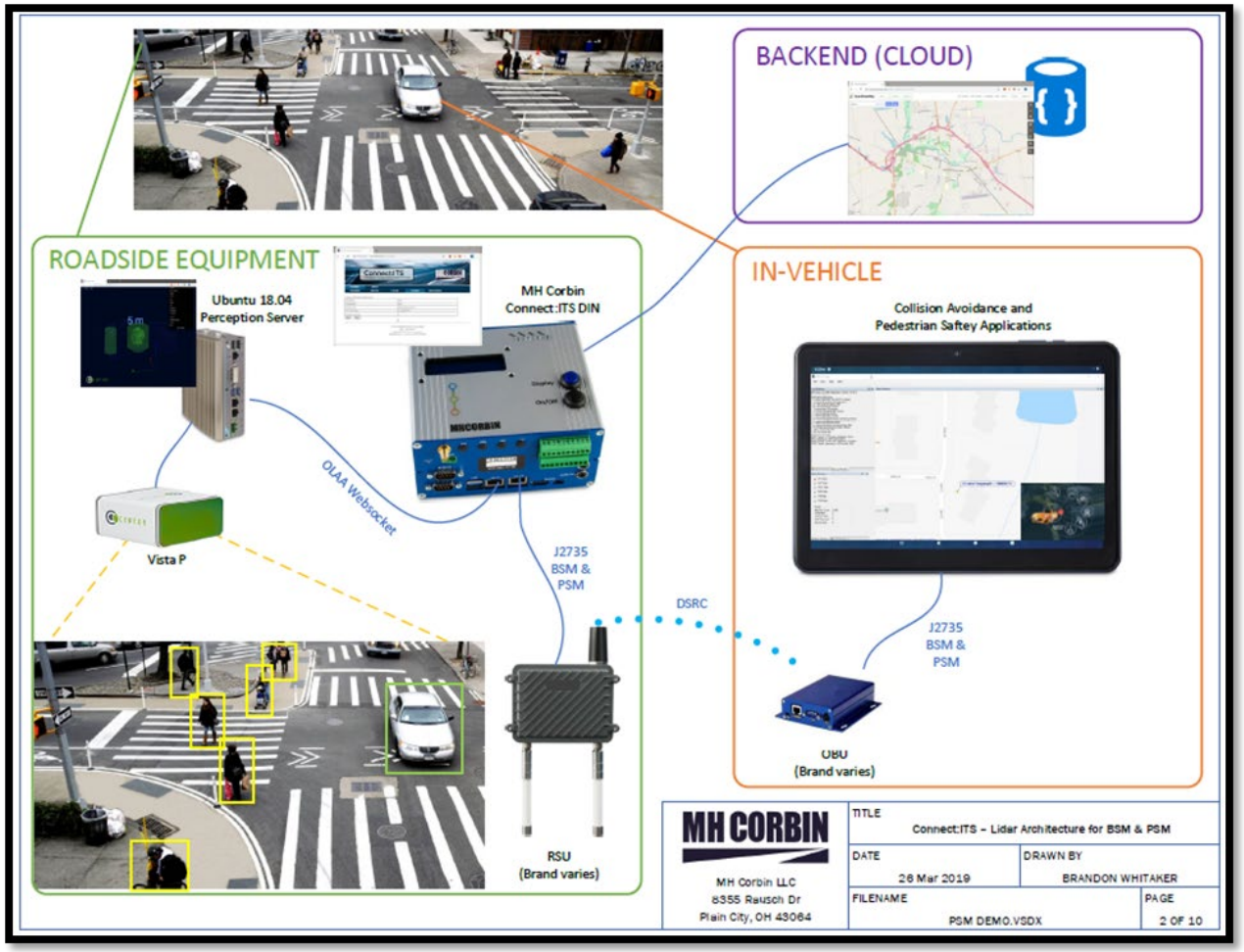
Cisco IC3000

US 41 FRAME Evaluation of CV – V2P



MH Corbin's Safety Message Broadcast Five-Step Methodology

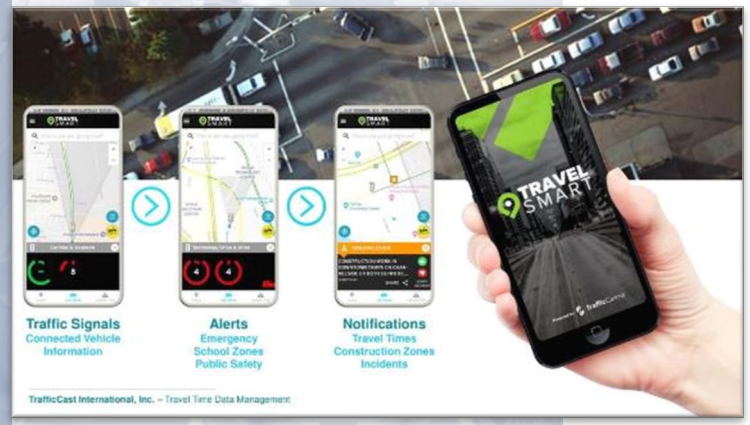
MH Corbin Connect:ITS

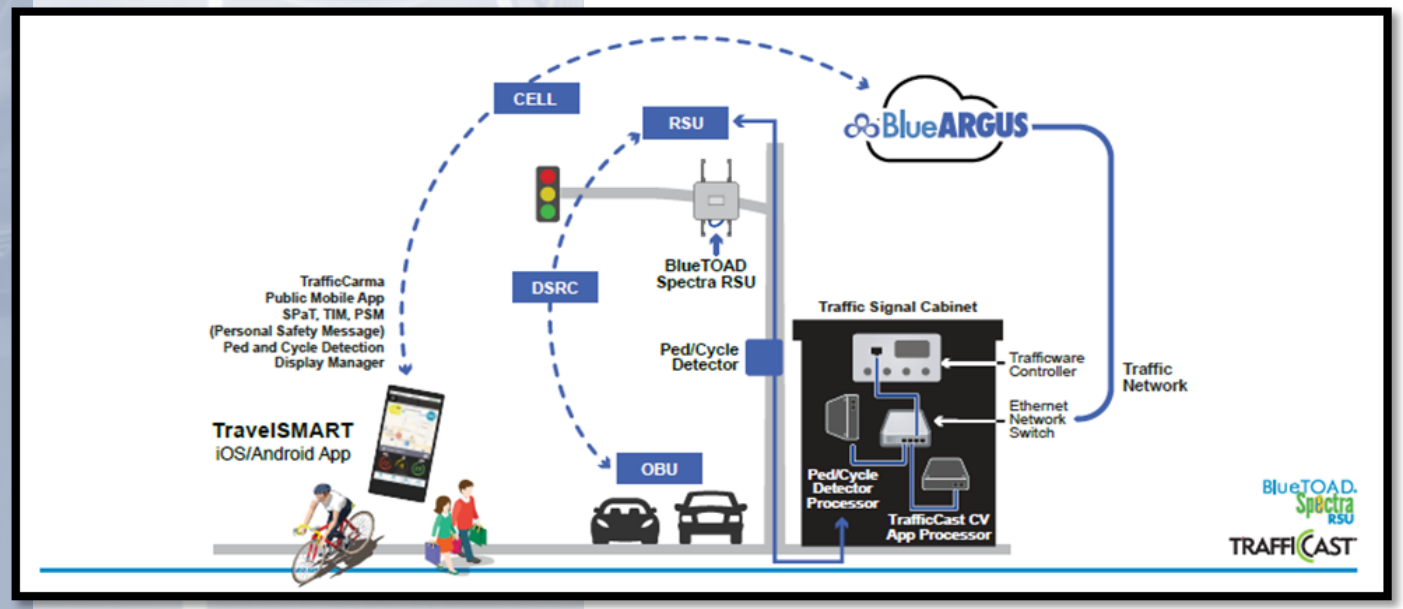


Pedestrian Detection Roadside Equipment and Communication

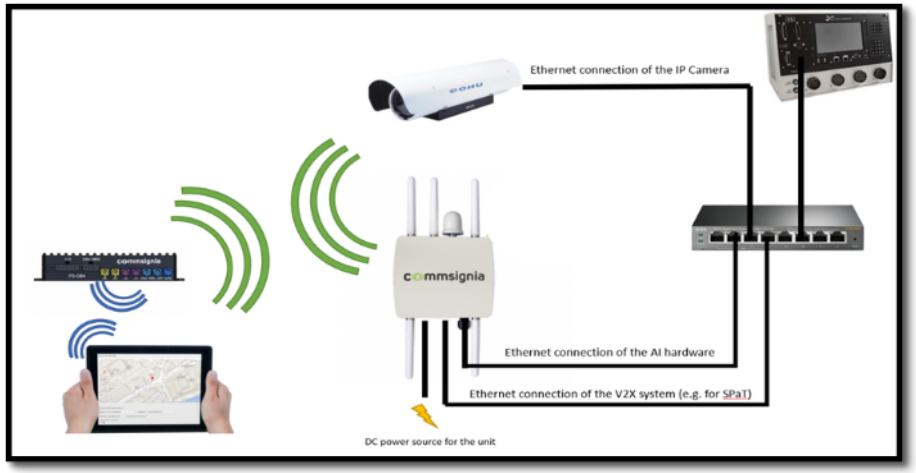
US 41 FRAME Evaluation of CV

TrafficCast TravelSMART





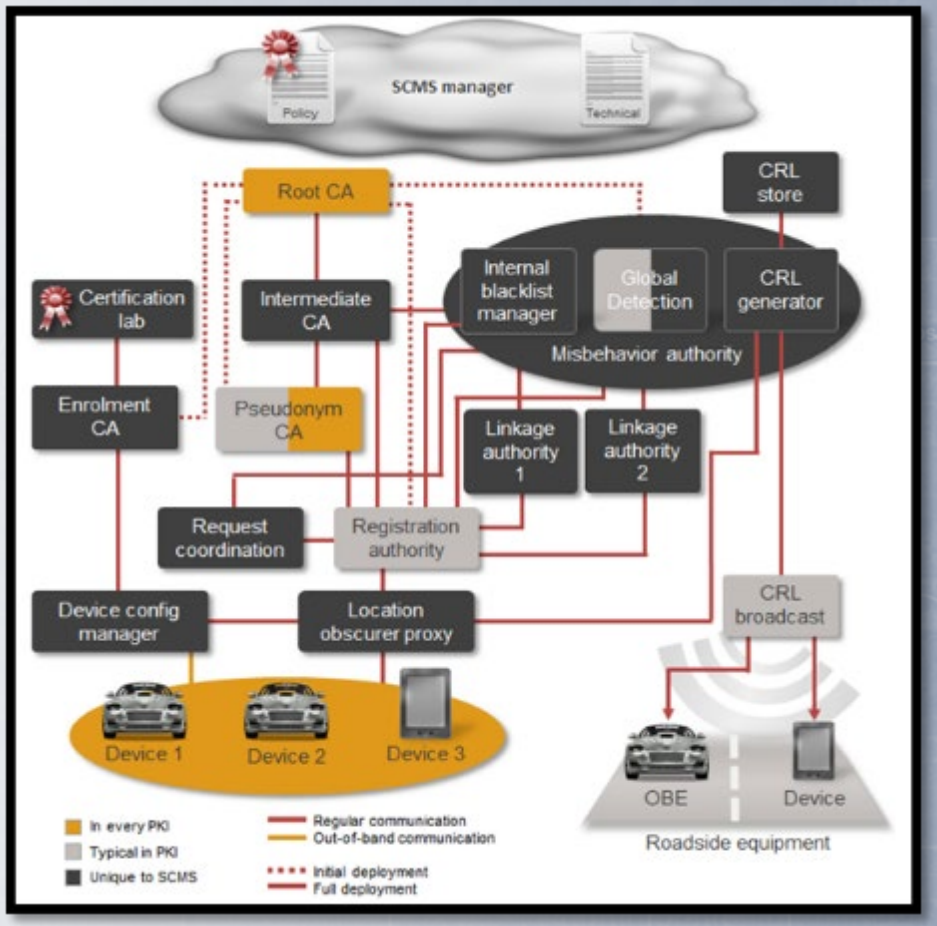
Applied Information TravelSAFELY



US 41 FRAME Evaluation of CV

SCMS

- Allows for the management of security certificates
- Ensures data is validated and secure
- SCMS Vendor
  - Integrity Security Services (ISS) – *a Greenhill Company*



SCMS Communication Architecture

US 41 FRAME Procurement Analysis

Procurement Analysis

- Procurement of Contractor Design-Bid-Build (D-B-B)

  Recommendation: Use the existing ITS Maintenance Contractor to install required infrastructure items requiring above ground and overhead work

- Procurement of Devices (D-B-B)

  Recommendation: ITS Maintenance Contractor purchase equipment as recommended by the System Manager and approved by the Department

- Procurement of Materials (D-B-B)
  - ITS Maintenance Contractor purchases and is reimbursed purchase price + 5%

US 41 FRAME Conclusion

Timeframes for Construction & Implementation

- (FPID 431313-1) Active Construction Project
  - Expected Finish Late 2023
- US 41 FRAME Project Procurement of Some Devices in First Quarter of 2022
- Installation of devices for 8 Intersections (not affected by construction project) - First half of 2022
- Remaining Devices to be Installed once (FPID 431313-1) is Completed

Next Steps

- Construction/Procurement of devices, software, and hardware
- Integration and Testing
- Near Miss Detection
- CV Deployment
- Coordinate with auto dealers along the corridor
- Bike/Ped - TSM&O / CV Applications

Safety Message

FDOT

TARGET ZERO
FATALITIES & SERIOUS INJURIES

Questions?