METROPOLITAN PLANNING ORGANIZATION FOR TRANSPORTATION

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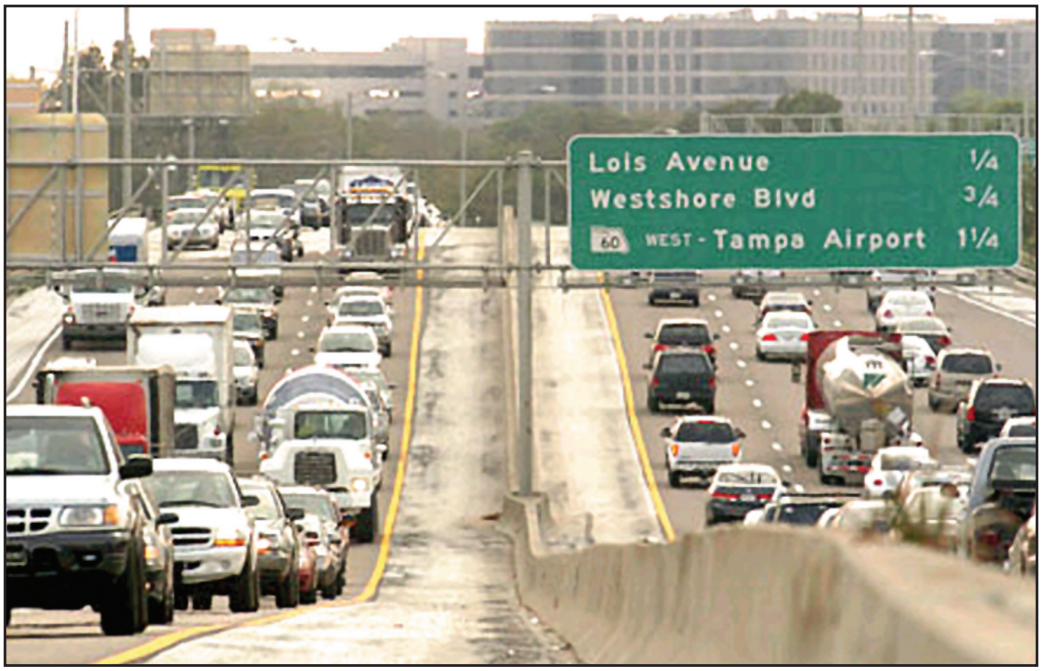
Hillsborough County Congestion Management Process Definition And Guidelines



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PREFACE

The Hillsborough County Congestion Management Process (CMP) Definition and Guidelines provides a detailed description of how the Hillsborough County Metropolitan Planning Organization (MPO) CMP is maintained as an integral part of the overall metropolitan transportation planning process. It demonstrates that the CMP meets federal requirements and guidance recently furnished by the Federal Highway Administration (FHWA). In addition, the report clarifies existing practices and suggests new approaches for the MPO's consideration in addressing future updates.

This report is divided into ten sections based on the FHWA guidance for a step-by-step approach to developing the CMP at both the system-wide and corridor-specific levels. The intent is to be a road map for updates to the CMP System Performance Report and future corridor or sub-area studies.

INTRODUCTION

The Safe, Accountable, Flexible, Efficient, Transportation Equity Act – A Legacy for Users (SAFETEA-LU) requires all Metropolitan Planning Organizations (MPO) in federally-designated Transportation Management Areas (TMA) to maintain a Congestion Management Process (CMP). The CMP expands on the requirements dating from the early 1990's for MPOs to address and manage congestion.

With a population that exceeds the minimum threshold of 200,000 that is specified in federal planning regulations, the Hillsborough County MPO is part of a TMA and is therefore required to have a CMP as an integral part of its ongoing regional planning process.

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

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

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

1. Methods to monitor and evaluate the performance of the multimodal transportation system, identify the causes of recurring and non-recurring congestion, identify and evaluate alternative strategies, provide information supporting the implementation of actions, and evaluate the effectiveness of implemented actions;

2. Definition of congestion management objectives and appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods;

3. Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions;

4. Identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies that will contribute to the more effective use and improved safety of existing and future transportation systems based on the established performance measures;

5. Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy (or combination of strategies) proposed for implementation; and

6. Implementation of a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures.

As a supplement to SAFETEA-LU requirements, a more detailed checklist was developed by the FHWA Florida Division office in 2007. The Checklist is meant to ensure that all MPO CMP's become fully integrated into the metropolitan planning process. This report follows the components of the checklist (Figure 1.1). The complete checklist is provided in Appendix A-1.

As part of this report, an outline is provided for developing corridor or subarea congestion management studies. The studies will define the scope of CMP-related analysis for individual corridors, and the improvements that will be required to reduce and minimize congestion.

Figure 0.1: Congestion Management Process Checklist

1) CMP Area of Application

2) System Definitions (modes and network)

3) Performance Measures

4) Performance Monitoring Plan

5) Identification & Evaluation of Strategies

6) Monitoring Strategy Effectiveness

7) Implementation & Management

8) Integration into MPO Process

1.0 AREA OF APPLICATION

1. CMP Area of Application
The area of application refers to the geographic area to which CMP functions and the analysis are applied. It is the area where congestion levels are monitored and congestion management strategies evaluated and implemented.

1.1 Hillsborough County MPO

The Hillsborough County MPO is the federally designated planning agency serving unincorporated Hillsborough County and the cities of Tampa, Temple Terrace, and Plant City. The MPO includes an area of approximately 1,070 square miles with an estimated 2007 population of 1.18 million (Figure 1.1).

1.2 CMP Overview

The Hillsborough County MPO CMP is a systematic process that provides information on transportation system performance and alternative strategies to alleviate congestion and enhance the mobility of persons and goods. It includes methods to monitor and evaluate transportation performance, assess and implement cost-effective actions, and evaluate the effectiveness of implemented actions.

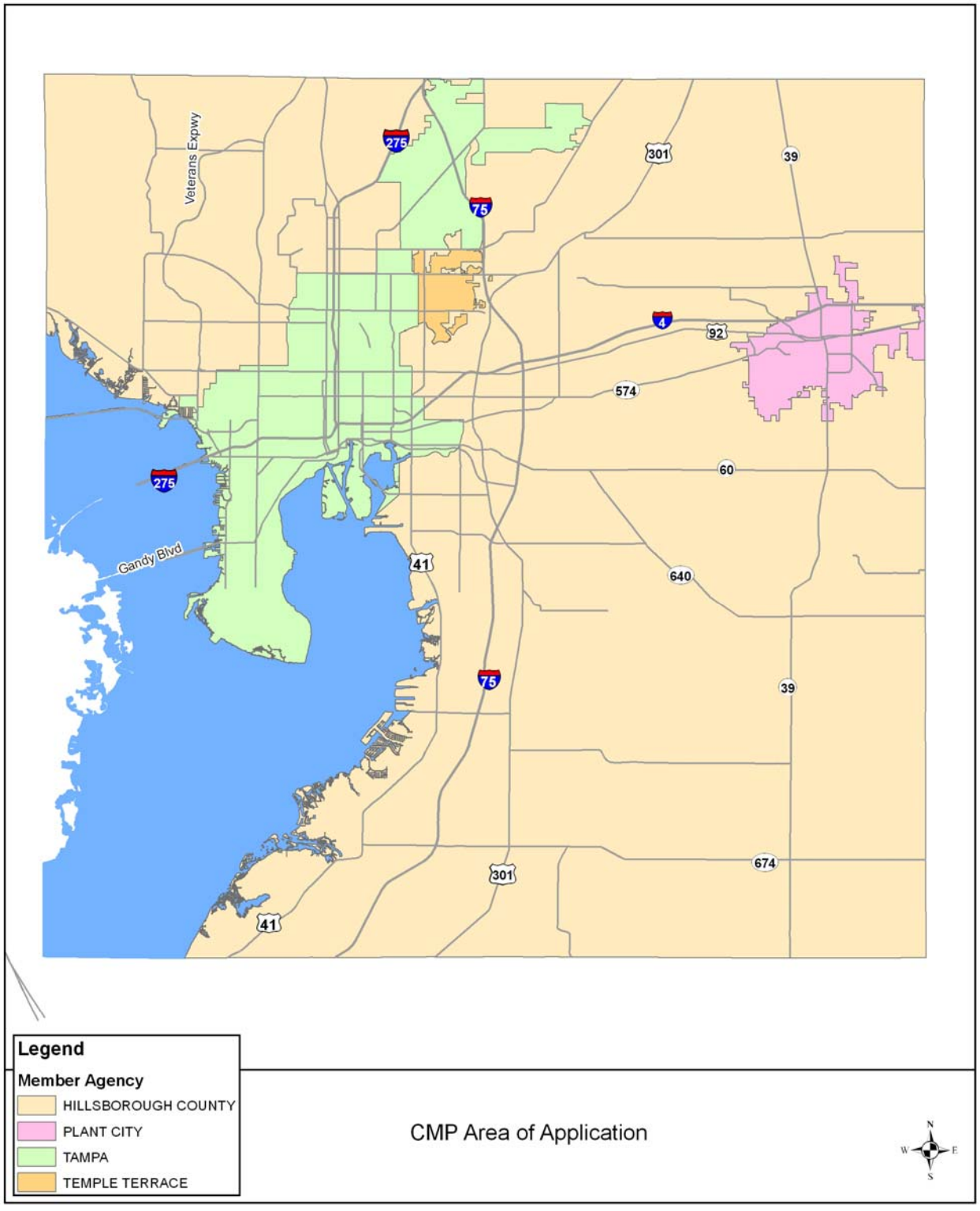
The data and information presented in the CMP provide benchmarks for evaluating mobility conditions on a system-wide level and within selected corridors in Hillsborough County. In addition, the performance data provide a tool to assess the effectiveness of implemented transportation projects and strategies.

1.3 Area of Application

The congestion management process covers the entire area served by the Hillsborough County MPO as shown in Figure 1.1. All metropolitan areas within a TMA must establish a viable CMP prior to the allocation of federal transportation funding to increasing the single occupancy vehicle (SOV) capacity of the roadway network. Since 1995, the Hillsborough County MPO has maintained a fully operational and functional CMP.

In addition, the Hillsborough County MPO is a member of the West Central Florida MPO Chairs Coordinating Committee (CCC), which has developed a Regional CMP (RCMP) covering seven counties. Section 8.2 describes the RCMP in more detail.

Figure 1.1: Hillsborough County MPO Area



1.4 CMP Documentation

1.4.1 System Performance Report

Prior to 2005, the CMP was known as the Congestion Management System (CMS). To monitor the overall system, the MPO periodically produces Congestion Management System Performance Reports. The data and analysis presented in the latest Hillsborough County MPO Congestion Management Process System Performance Report (published September 2005) provides a systematic evaluation of mobility. It examines conditions on the major roadway network of Hillsborough County in comparison to conditions in 2001. The Report refers to a number of system-wide and corridor-specific performance measures established by the MPO's Congestion Management Steering Committee. The Report covers all major roads (excluding local roads), and bicycle, pedestrian and transit facilities. The Report also covers Transportation Demand Management (TDM) services meant to reduce congestion and SOV travel. The performance measures in the Report are used to assess the effectiveness of implemented transportation projects and strategies. The Report also evaluates conditions in 39 corridors and ranks them by severity. Overall, the Report reflects a progression of multiple efforts over many years to develop and implement a comprehensive CMP program. The report also provides a set of recommendations to guide future updates.

System Performance reports are produced to provide input into the updates of the LRTP on a five year cycle. A Performance Report serves as an important document and tool in helping to prioritize corridors for improvement, identify corridors that will likely become congested, and enable a more proactive approach to the transportation planning process.

1.4.2 Congestion Management Corridor Studies

The System Performance Reports identify congested corridors as candidates for more detailed analysis. These corridors are selected based on established performance data and measures. Each corridor study recommends low-cost, quick response strategies to improve mobility by increasing alternative travel modes and reducing traffic congestion. A total of seven congestion management corridor studies have been conducted:

- Dale Mabry Highway / Himes Avenue from Kennedy Boulevard to Ehrlich Road (1998)
- Bearss Avenue from Dale Mabry Highway to Bruce B. Downs Boulevard (1999)
- Hillsborough Avenue / Memorial Highway from W. Longboat Boulevard to Dale Mabry Highway (2000)
- Busch Boulevard from Florida Avenue to 56th Street (2000)

- Fletcher Avenue from Florida Avenue to 56th Street (2000)
- Kennedy Boulevard from Memorial Highway to Ashley Drive (2003)
- Busch Boulevard from Florida Avenue to 56th Street, Urban Design and Streetscaping Considerations (2004)

The MPO conducts more detailed corridor studies as conditions change and as resources permit, completing an average of one per year. Once approved by the MPO board, recommendations from corridor studies are forwarded to state and local implementing agencies. Section 9.0 describes the content of these corridor studies in more detail.

2.0 SYSTEM DESCRIPTION AND DEFINITIONS

2. System Definitions (modes and network)
The CMP must define the transportation "system" included in the functions and analysis. It includes the modes and network to be monitored in the CMP.

2.1 Modal Components and Databases

2.1.1 CMP Transportation Network

The CMP network consists of new and existing transportation facilities that are identified by the MPO through the long-range transportation planning process. The CMP corridors are based on the MPO's designated Major Road Network. All corridors that are part of the Major Road Network are eligible for federal transportation funding through the MPO process.

The primary goal of the CMP is to improve system performance by alleviating congestion through alternatives to enhance the mobility of persons and goods. Therefore, the CMP transportation network comprises a roadway network, transit network and bicycle and pedestrian networks, as well as programs that support freight movement and transportation demand management.

2.1.1.1 Designated Major Road Network

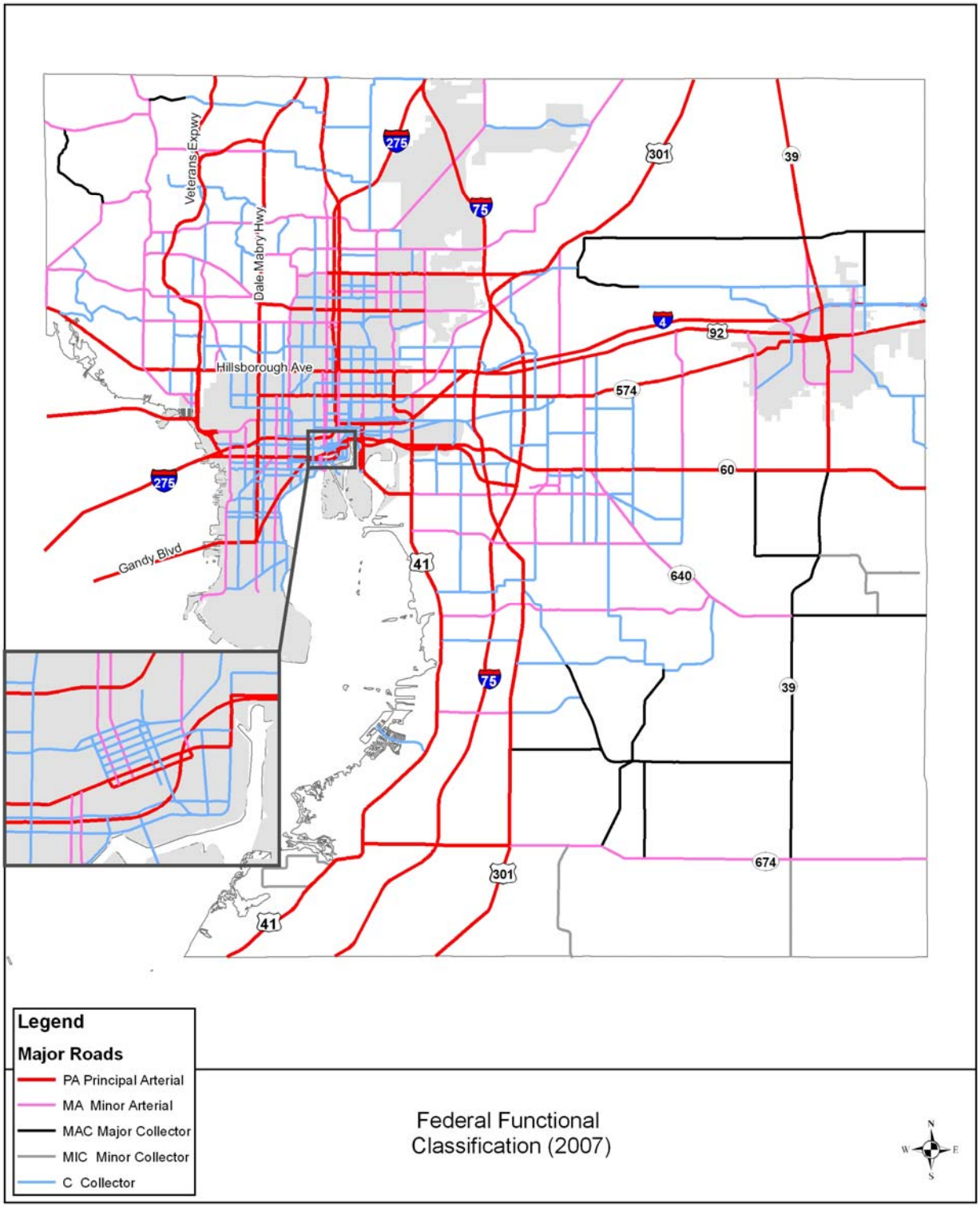
The current CMP major road network includes three categories: freeways and toll roads, arterials, and collectors. Functionally classified local roads and residential streets are excluded. The classification of roadways is based upon FHWA's defined functional classification system. Figure 2.1 displays the current federal functional classification of the major road network.

2.1.1.2 Definition of Congested Corridors

Congested roadway corridors are defined using data from the MPO's Visual Transportation Inventory Management and Analysis System (vTIMAS). The CMP roadway network consists of segments and corridors. Segments represent one section of a roadway with a defined length (e.g., 0.5 miles). A segment is considered congested when the existing traffic volume (V) is equal to or greater than the defined maximum service volume (MSV). The maximum service volumes are tied to the adopted Level of Service (LOS) for each major road as defined in the local government comprehensive plans, and are derived from FDOT's Generalized LOS Tables available at www.dot.state.fl.us/planning/systems/sm/los/pdfs/tables-051707.pdf. Logical termini are determined by discussions with MPO staff, professional judgment and the location of congested segments within each corridor.

A corridor consists of a group of consecutive segments along an existing roadway. Congested corridors are defined by determining the sum of the V/MSV ratios of the individual segments multiplied by their lengths, divided by the corridor length:

Figure 2.1: CMP Major Road Network



$$\text{Corridor Weighted V/MSV Ratio} = \frac{\sum (\text{Segment V/MSV X Segment Length})}{\text{Corridor Length}}$$

A ratio equal to or greater than one reflects a congested corridor. Figure 2.2 displays the current Level of Service (LOS) of the major road network of the CMP, based on the most recent available traffic count data. Appendix B-1 provides the list of corridors from the 2005 System Performance Report, and Appendix B-1A shows the underlying data fields used in Figure 2.2., the schema or "flowchart" for the GIS data analysis, and methodology for determining highway LOS. The System Performance Report contains a complete list of congested roadway segments.

2.1.1.3 Designated Transit Network

Figure 2.3 depicts the CMP transit network. The network includes the entire existing fixed-route bus and streetcar system of the Hillsborough Area Regional Transit Authority (HART) as well as the local routes provided by Plant City known as the Strawberry Connection. It also includes express routes serving park and ride facility locations. In addition, express routes serving Hillsborough County to and from Pinellas County via the Pinellas Suncoast Transit Authority (PSTA), are included in the network. All of these systems are eligible for federal funding. Appendix B-2 contains the underlying GIS data fields for the routes shown in Figure 2.3. A complete listing of current Tampa, Streetcar HART and Plant City transit routes is also provided.

2.1.1.4 Designated Bicycle/Pedestrian Network

Figures 2.4, 2.5 and 2.6 depict the existing CMP network of on-road bicycle, off-road trails and pedestrian facilities. A bicycle facility is defined as a signed and striped bicycle lane, or at a minimum, a signed or unsigned four-foot paved shoulder. Pedestrian facilities consist of sidewalks located along the defined Hillsborough County major roadway network, and the percent of the segment with sidewalk coverage. Appendix B-3 contains the underlying facility information used for the GIS data in Figures 2.4 to 2.6.

2.1.1.5 Designated Freight Network

Figure 2.7 depicts the existing truck route and rail network in Hillsborough County. The current truck route network limits the movement of "through-trucks" to designated routes. This includes single unit trucks with three or more axles and non-passenger combination vehicles. Trucks must enter Hillsborough County and travel between their origin and destination to the extent possible on a designated truck route. The rail network is also depicted in Figure 2.7 and consist of the rail lines in Hillsborough County, all of which are operated by CSX Transportation (CSXT). Appendix B-4 contains the underlying data used for the truck route network used for the GIS data in Figure 2.7.

The City of Tampa also designates truck routes, as shown in the Appendix on page B-46.

Figure 2.2: Major Roadway LOS

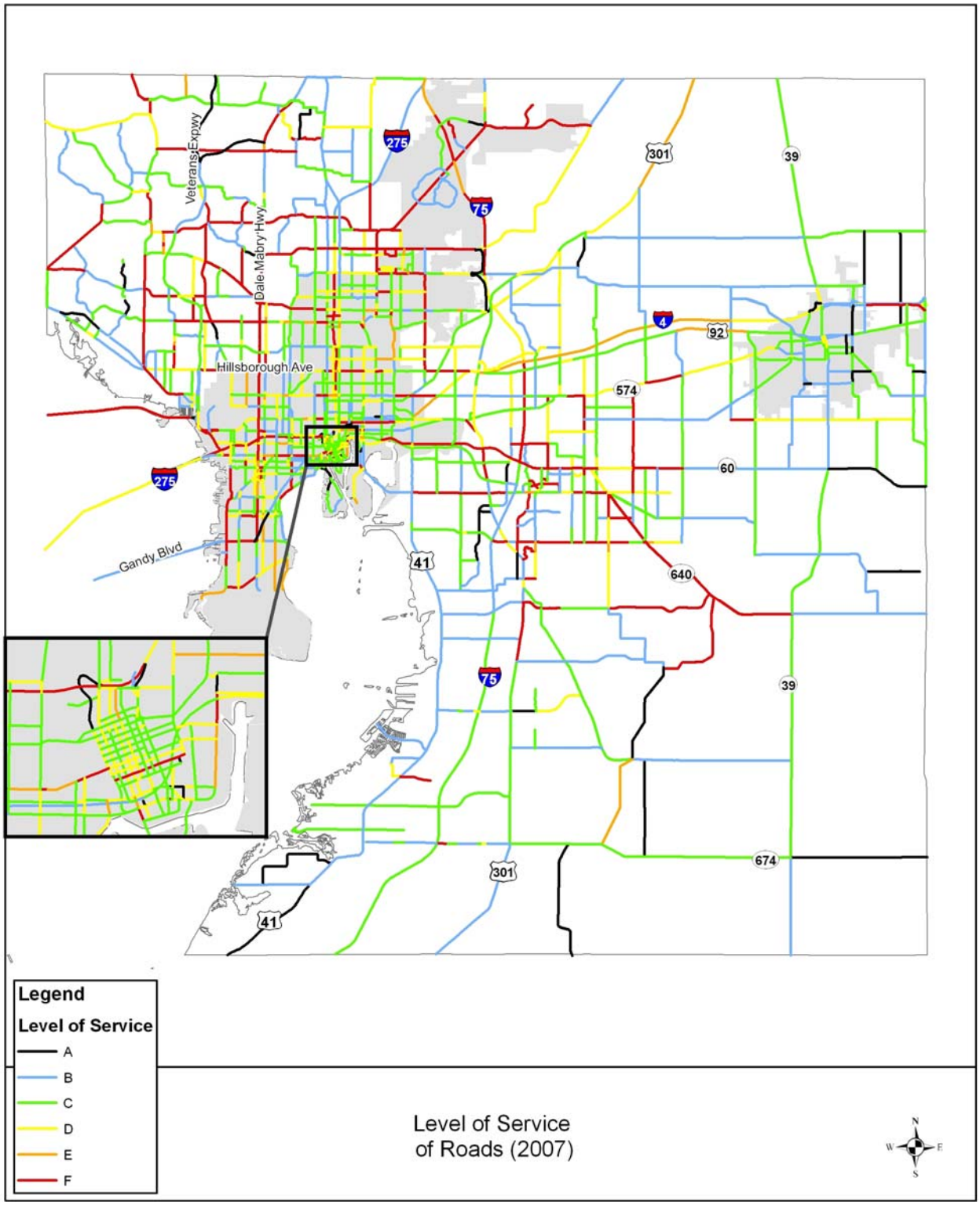


Figure 2.3: CMP Transit Network

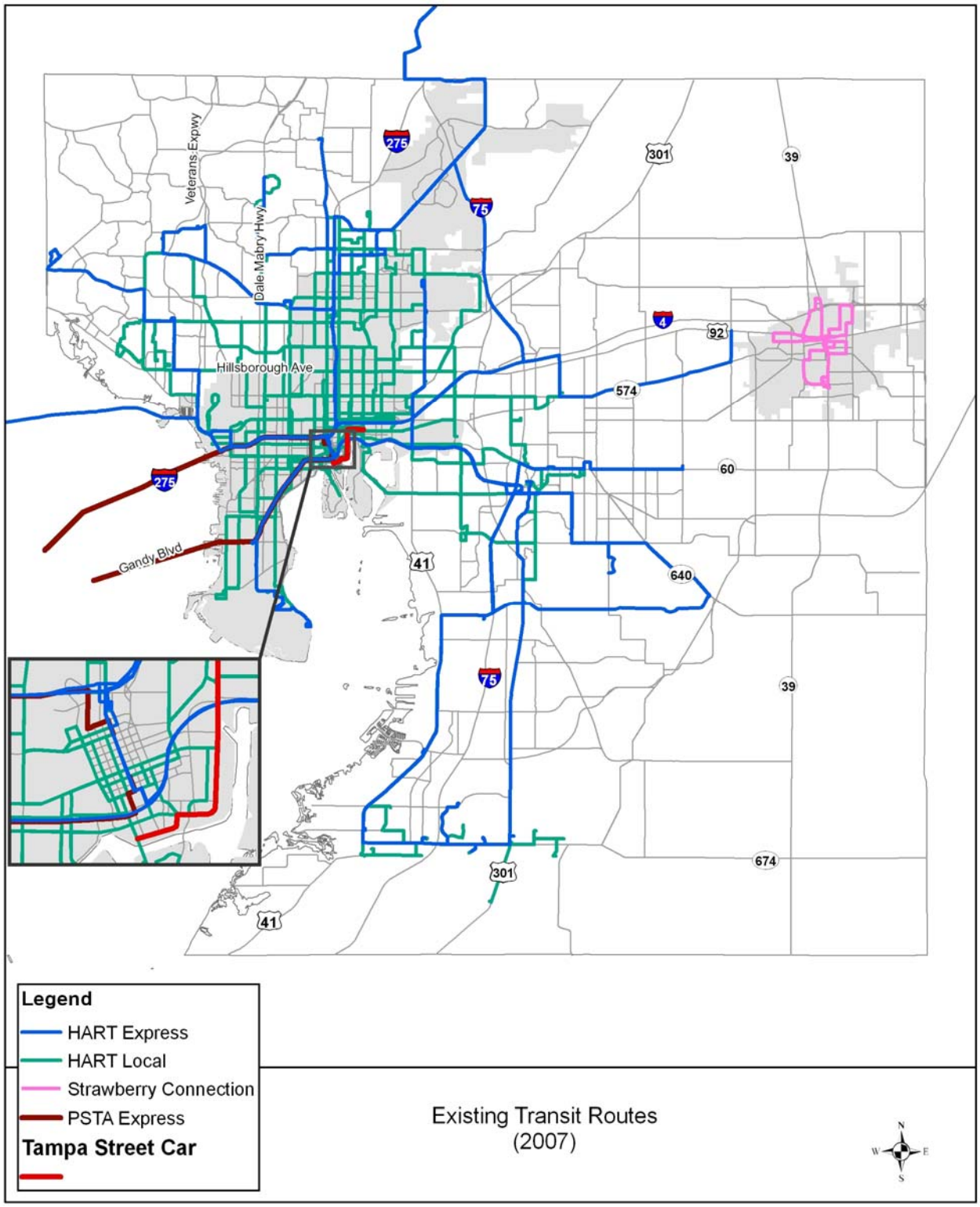


Figure 2.4: CMP On-Road Bicycle Network

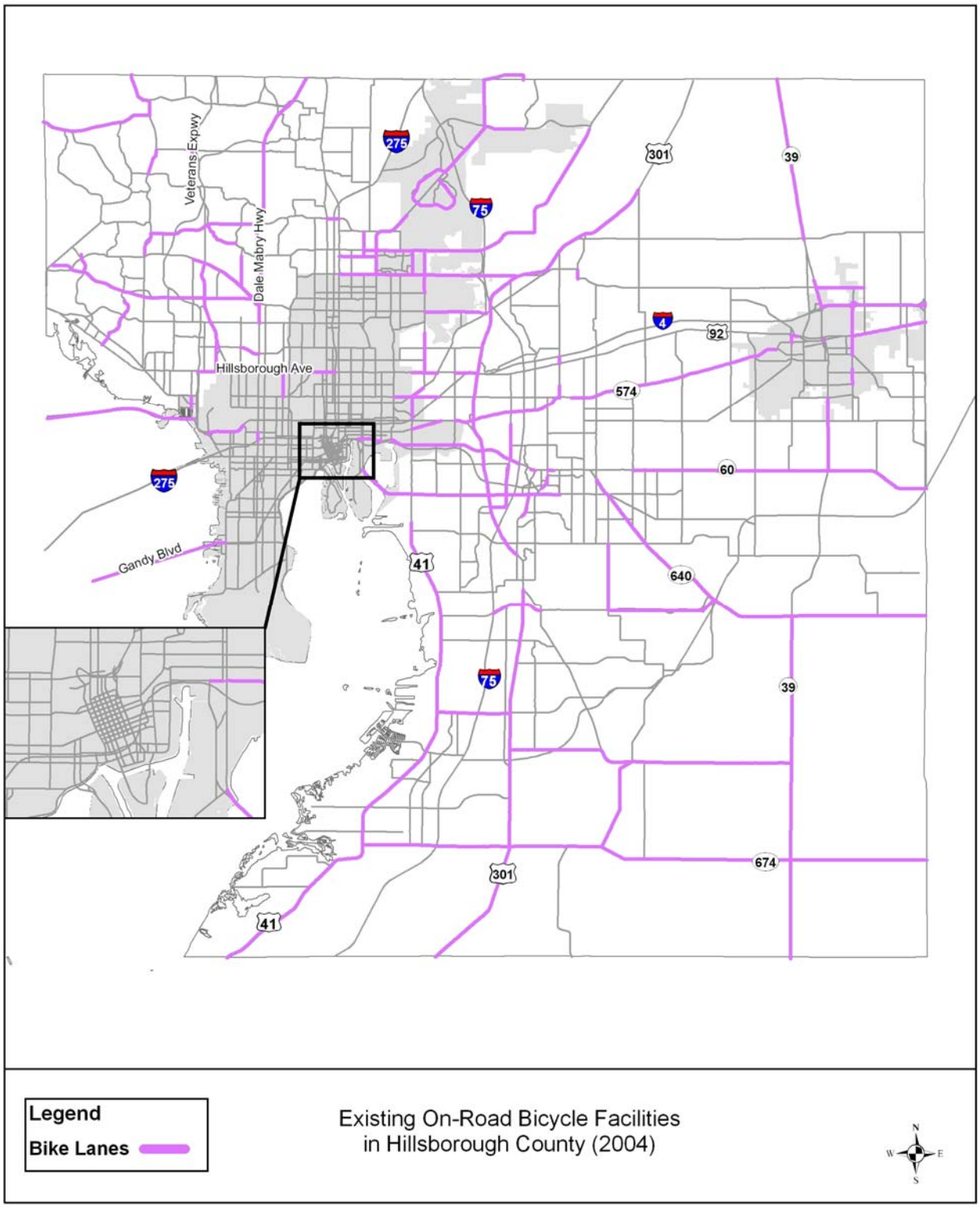


Figure 2.5: CMP Off-Road Trail Network

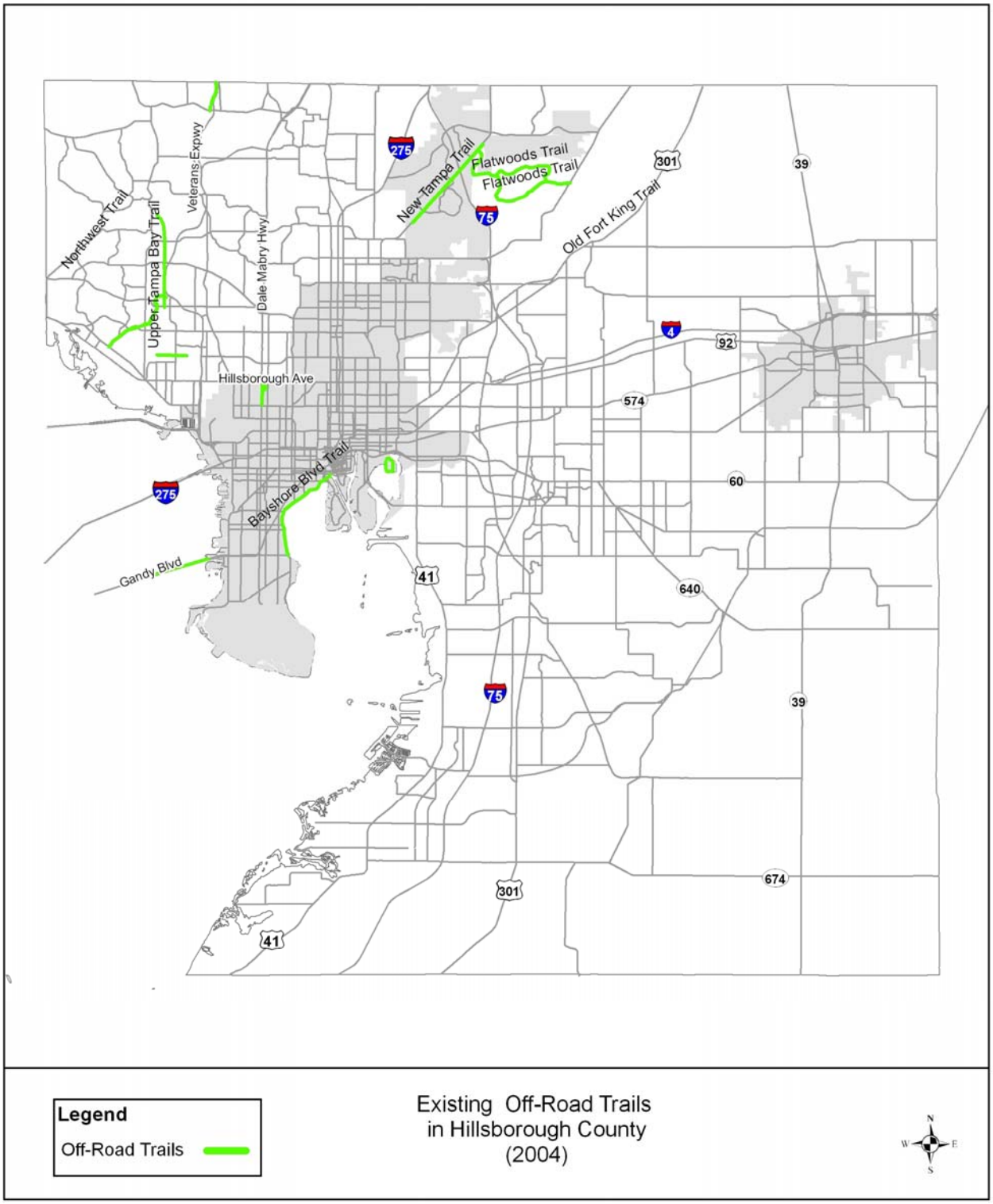


Figure 2.6: CMP Pedestrian Network

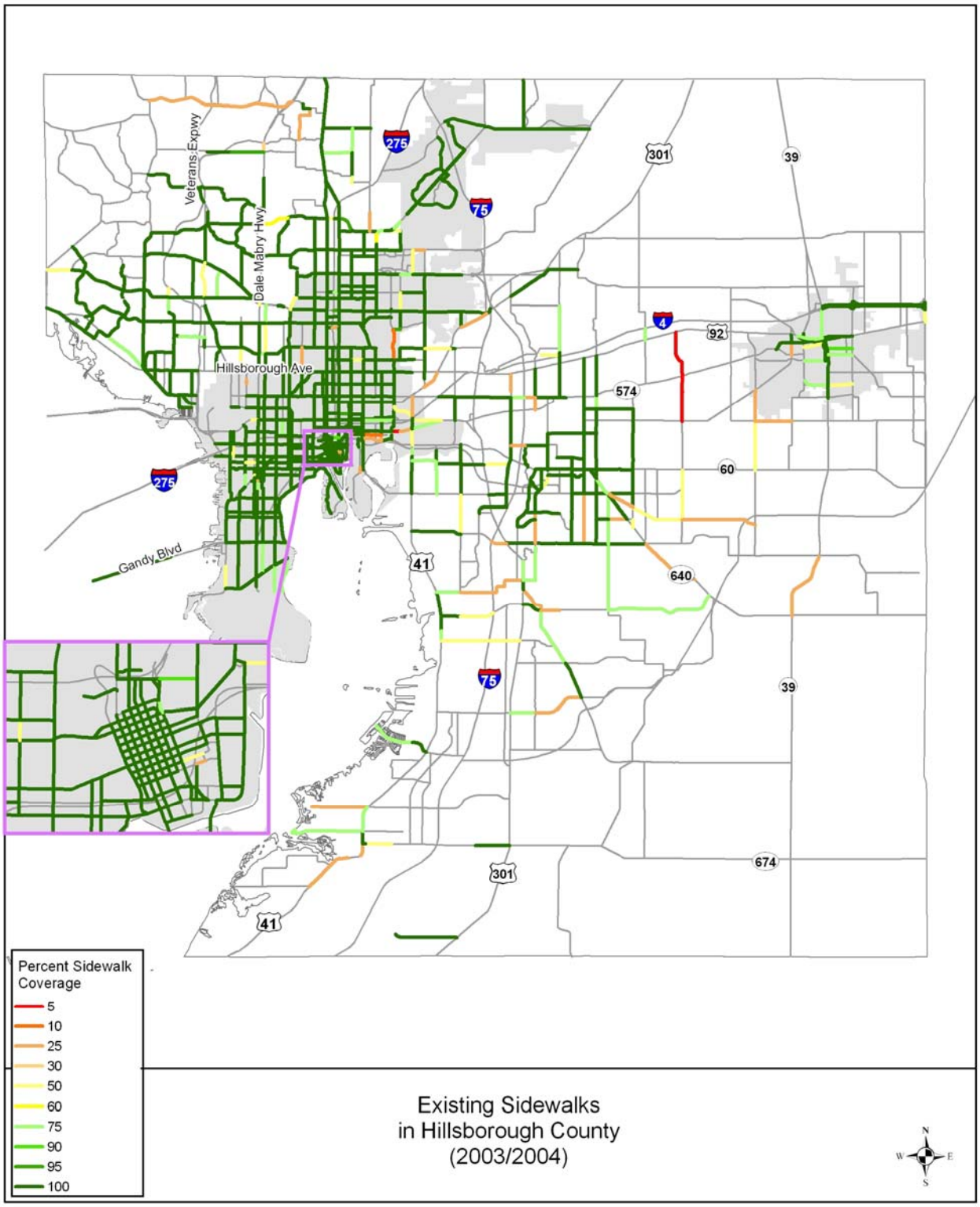
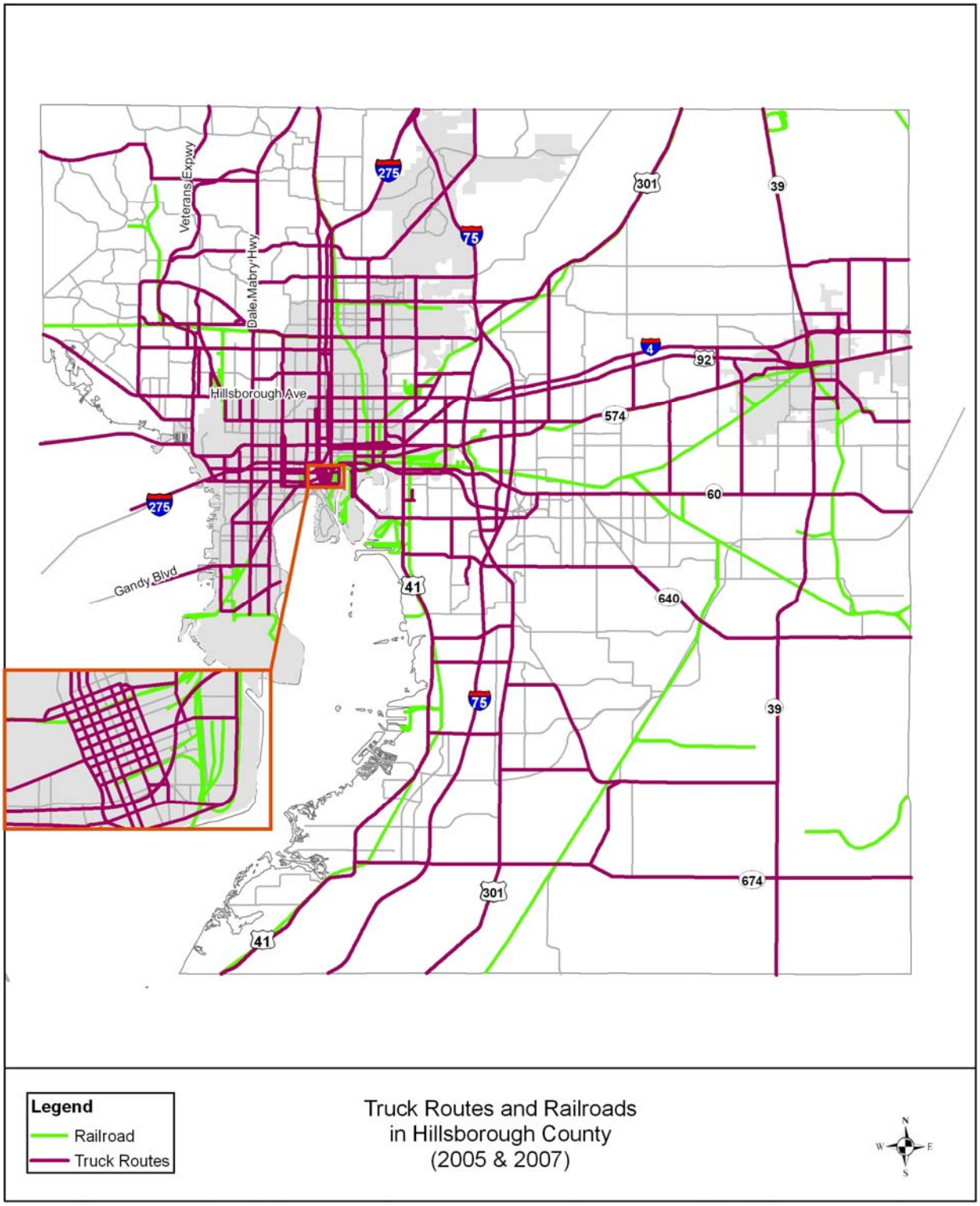


Figure 2.7: CMP Freight Network



District Seven of the Florida Department of Transportation (FDOT) has been conducting freight and goods movement studies. As part of this process, the current freight infrastructure in the Tampa Bay region was identified, including the location of 12 freight activity centers in Hillsborough County. The overall freight network includes roads, rail, airports, seaports, intermodal facilities, rail facilities, mining operations and waterway connectors. Appendix B-4 contains the latest Hillsborough County Freight Infrastructure map from the Study.

In 2006, FDOT also conducted a freight hot spot analysis. The analysis identified 50 problematic intersections and roadway segments for freight vehicles. Appendix B-4, page B-45, contains a map of the freight hot spots in Hillsborough County and corresponding description of the roadway segment or intersection.

2.1.1.6 Designated Transportation Management Organizations (TMOs)

The CMP network is served by several agencies in the Tampa Bay region that provide TDM services and programs (Figure 2.8). Specifically, Hillsborough County is served by the following network of TMOs:

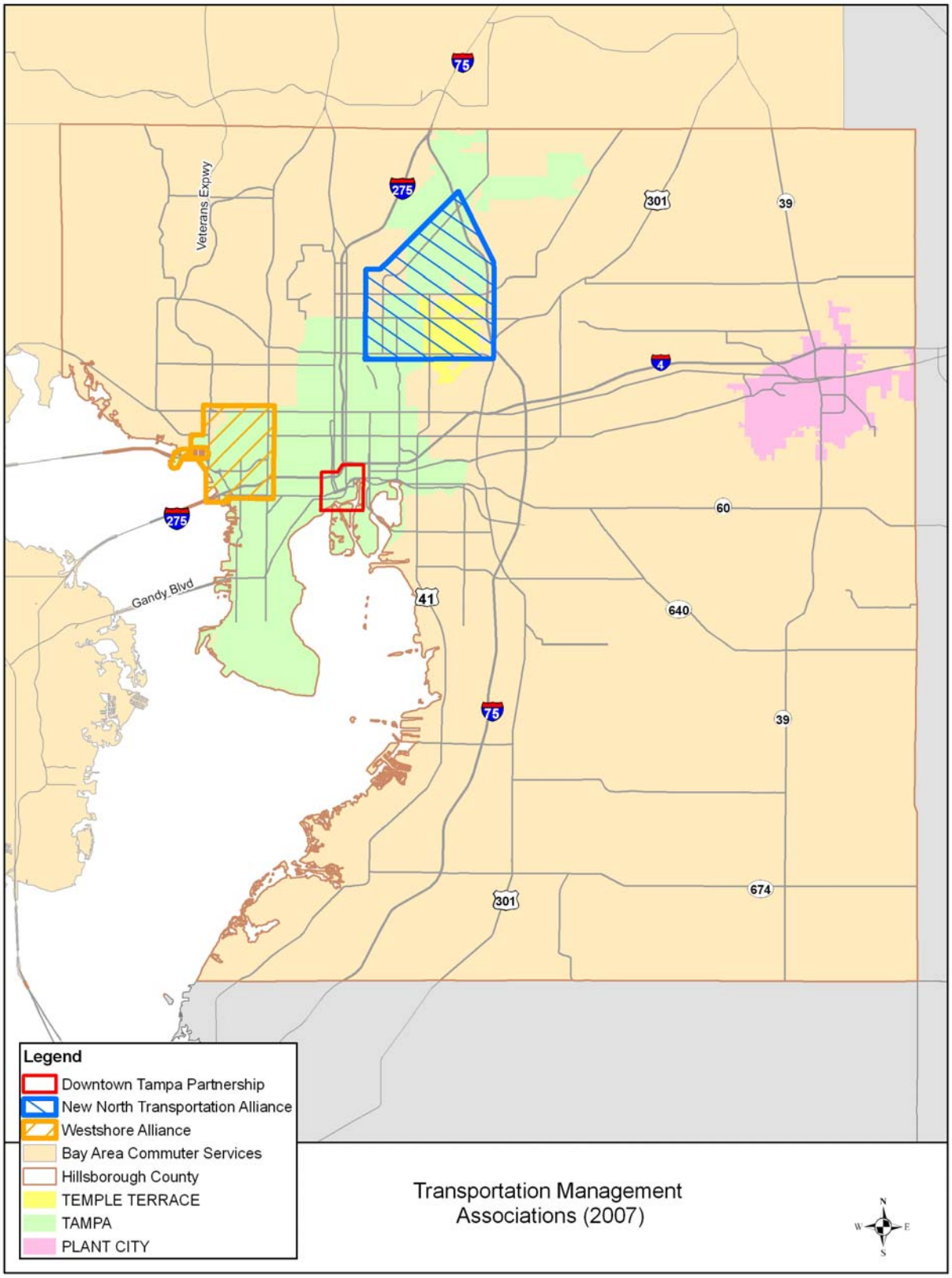
Bay Area Commuter Services: BACS is a private-public agency serving as the region's commuter assistance program, promoting ride-share matching and vanpools to Citrus, Hernando, Hillsborough, Pasco and Pinellas Counties. It provides data on all registered carpool and vanpool participants in Hillsborough County. As part of the MPO's CMP, carpool and vanpool registration and occupancy statistics are monitored on a regular basis.

New North Transportation Alliance: A transportation management organization/agency (TMO/TMA) providing a forum for businesses, local governments, residents, and commuters to address the transportation needs of the New North area, comprising the University of South Florida (USF) and New Tampa communities.

Tampa Downtown Partnership: An organization supported through a private-public partnership for the growth and development of downtown Tampa, including enhancements to the area's transportation system.

Westshore Alliance: An organization supported through a private-public partnership, focused on developing the living and working environment, and transportation system of region's largest employment center.

Figure 2.8: CMP Transportation Management Organizations



3.0 PERFORMANCE MEASURES

3. Performance Measures of the CMP
The performance measures of a CMP provide the mechanism for quantifying the level of congestion in the transportation system. These measures may also be used to evaluate the effectiveness of implemented congestion management.

Performance measures define how effectively and efficiently the transportation system is operating. Generally speaking, they indicate the difference between optimal free flow travel and congested conditions. Performance measures are developed to quantify levels of congestion, and to provide an analytical approach in determining congestion trends. The Hillsborough County MPO utilizes a tiered approach incorporating two levels of performance measures: System-Wide and Corridor-Specific.

3.1 Performance Measure Documentation

3.1.1 System-Wide Documentation

The system-wide performance measures used by the MPO are provided in the System Performance Report. Each measure is summarized in the report to:

- Determine congested corridors across the major road network. A corridor is considered congested when its Volume to Maximum Service Volume (V/MSV) ratio is greater than 1.00;
- Illustrate current multimodal system performance based on congestion and other measures;
- Consider the trend in system performance over time based on current conditions versus conditions documented in previous System Performance Reports; and
- Provide a benchmark for evaluating future performance of the transportation system.

The results are documented in a summary format, including a set of tables, maps and charts for each measure.

3.1.2 Corridor-Specific Documentation

Corridor-specific performance measures are listed in the latest System Performance Report (2005). The 2005 report summarizes mobility conditions within 39 corridors determined to be congested in 2001 and/or 2004. Each corridor is summarized in a one-page format with tables and maps, which document conditions according to the adopted corridor-specific performance measures.

3.2 Adopted Performance Measures

In February 2000, the Hillsborough County CMS Steering Committee approved several primary performance measures to quantify conditions for overall system and mobility conditions of each CMS corridor. These system-wide and corridor-specific measures are used consistently in the System Performance Reports to describe the mobility conditions of Hillsborough County's transportation system over time.

3.2.1 System-Wide Measures

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

Vehicle Miles Traveled (VMT) by Roadway Level of Service: This measure shows vehicle utilization on roadways with different levels of congestion.

Number of Carpools/Vanpools: Carpool and vanpool data is obtained from Bay Area Commuter Services (BACS) for registered participants in both programs.

Bicycle Facility Miles per Roadway (Centerline) Mile: This measures the coverage of bicycle facilities on the major roadway network.

Bicycle Crashes: To measure relative safety of bicycle travel, crash data for all major roadways is obtained from the Florida Department of Highway Safety and Motor Vehicles (DHSMV).

Sidewalk Miles Per Roadway (Centerline) Mile: This measures the coverage of sidewalk facilities on the major roadway network.

Pedestrian Crashes: To measure relative safety for pedestrians, pedestrian-related crash data for all major roadways is obtained from DHSMV.

Percent of Population near Transit: This measure indicates the total population which is within one-quarter mile of fixed-route transit service.

Percent of Transit Service by Headway: This measure indicates the frequency of HART local and express fixed route bus service on a system-wide level during peak and off-peak travel periods.

Transit Passengers per Revenue Hour: This measure is used by HART to measure the effectiveness of the fixed route transit system, and reflects its total usage.

Transit Cost per Passenger Trip: This measure reflects the operating cost to the transit system of each fixed route passenger trip (where a trip is defined as a boarding).

Transit Farebox Recovery: This measure reflects the proportion of revenue generated through fares by dividing the fares collected by the cost of the transit system's total operating expenses.

3.2.2 Corridor-Specific Measures

Corridor-specific measures are utilized by the MPO to evaluate and select congested corridors for further study. Five specific performance measures are applied to each identified corridor.

Corridor Weighted Volume to Maximum Service Volume Ratio (V/MSV): Each congested corridor is defined by determining the weighted traffic volume of the combined roadway segments to the maximum service volume ratio for the defined corridor.

Percentage of Roadway Corridor Miles with On-Road Bicycle Facilities: The percentage of on-road bicycle facilities is calculated for each corridor on both sides of the roadway.

Percentage of Roadway Corridor Miles with Sidewalks: The percentage of sidewalks is calculated for each corridor on both sides of the roadway.

Transit Passengers per Revenue Mile: Transit routes and the number of passengers per revenue hour are calculated for each route along the identified roadway.

Transit Service Headway: Transit routes and schedules are reviewed and analyzed for each identified roadway.

Additional information is also collected to help determine the congestion rankings for each corridor. This information includes planned transportation improvements, designation as a constrained corridor, a transit emphasis corridor, and location within a Transportation Concurrency Exception Area (TCEA).

3.3 Potential Future Performance Measures

One main purpose of the CMP is to track conditions consistently over time; however, the CMP performance measures will be refined as technology and past experience or current practice allow new data to be considered. The following potential future performance measures will be considered by the CMP Steering Committee.

3.3.1 Freight and Goods Movement

The 2005 Systems Performance Report recommends that one or more system-wide and corridor-specific measures be added to the CMP evaluation process to reflect the importance of goods movement in Hillsborough County. In addition, goods movement has recently been identified by FHWA as an integral component to current and future CMP activities of all MPOs. Therefore, future CMP reports will focus on the conditions affecting the movement of goods across Hillsborough County's major transportation facilities (freeways, principal arterials, major interchanges/intersections). Performance measures for freight and goods movement will be added to evaluate conditions and strategies to manage congestion. Analyzing the impacts of freight on congestion, and vice versa, is integral to the CMP program.

Potential performance measures may include:

- Weighted V/MSV on Truck Routes (system-wide measure);
- Percent of VMT on Congested Major Roads Designated as Truck Routes (system-wide measure);
- Heavy Vehicle Classification Counts (corridor-specific measure); and
- Number of railcars, tonnage, or truck equivalents moved by rail.

As stated in Section 2.0, freight hot spots have been identified in the Tampa Bay Region, and are a valuable source of performance-related data. Future System Performance Reports will identify freight hot spots to be addressed in corridor studies.

3.3.2 Accidents and Incidents

Studies have shown that non-recurring congestion accounts for over half of all congestion in major metropolitan areas. Accidents and incidents and the time required for clearing them can be a major contributor to non-recurring congestion. Accidents typically refer to vehicular crashes along a specific location of a corridor. Incidents cover a broader description and may include crashes, stalled vehicles, abandoned vehicles, hazardous spills, fires, sporting or social events, parades, etc.

Data compiled from law enforcement citations is available from the Florida Department of Highway Safety and Motor Vehicles (DHSMV) and other jurisdictions. Therefore, future system performance reports will track accident and incident data, which may include:

- Crash Rates (Crashes per VMT) (corridor-specific measure);
- Top 100 crash locations (corridor-specific measure).

3.3.3 Duration of Congestion

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

3.3.4 Delay and Reliability

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

- Travel time versus free flow conditions or posted speed limits (corridor-specific or system-wide measure);
- Variability of travel times (corridor-specific or system-wide measure);
- Intersection delays (corridor-specific measure);
- Vehicle queues (corridor-specific measure);
- Operating speeds (corridor-specific measure).

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

4.0 PERFORMANCE MONITORING PROCESS

4. Performance Monitoring
Performance monitoring refers to the mechanism or processes for collecting the necessary data to quantify the CMP performance measures and track congestion over a specified period of time.

The MPO supports an ongoing data collection and monitoring program based on its adopted congestion management performance measures. The purpose is to periodically evaluate congestion and mobility conditions in Hillsborough County.

4.1 Data Acquisition Plan

The MPO collects and maintains transportation system information in order to effectively monitor performance. Table 4.1 summarizes the data routinely acquired by the MPO in support of the CMP. As displayed in the summary table, the CMP data program is based upon system-wide performance measures, but many elements can also be applied to corridor-specific studies. Each type of data and corresponding attributes are listed, along with appropriate definitions. The summary chart also provides the status of existing and future network information, data sources, frequency of updates, and agency contacts. The chart will guide future CMP data collection efforts to ensure that all necessary information is routinely and consistently collected for CMP System Performance Reports and corridor studies.

Depending on the selection of new or substitute performance measures, future data collection will also include travel time, delay or reliability data obtained from ITS, GPS or travel log sources.

4.2 Database Enhancements

Appendix B documents the CMP data in its current form. To increase the utility of the CMP databases, future enhancements will include:

- A data dictionary defining all GIS data fields for the major road and other networks;
- Standardized data for all transit providers to include route numbers, designations, span of service, and frequency by day and period (e.g., peak, off-peak, evening); and
- A uniform system of road segmentation with common segment IDs for all modes operating on the major road network (e.g., transit, bicycle, and pedestrian modes), such that separate modal databases can be linked together. This would facilitate monitoring multimodal conditions within corridors, sub-areas, on facilities at the segment level.

4.3 Data Review and Quality Assurance

CMP data is acquired by MPO staff but other agencies collect the source data to the maximum extent possible. Each agency provides data either upon request or publishes reports updated on a regular basis and typically posted to their website. Other data, such as inventories of bicycle and pedestrian facilities and counts, require extensive field-work by MPO staff or consultants. Data collection forms are used by staff or consultants when obtaining information in the field. The forms are later reviewed and then entered into a database. Regardless of the source, data review and quality control is conducted internally by MPO staff.

To assure the quality of CMP data, a step-by-step quality assurance methodology using independent reviewers will be developed and documented. The data should be reviewed for:

- Completeness;
- Computational errors;
- Consistency with historical data and/or data from surrounding areas to flag out-of-range values; and
- Documentation of metadata, software, and computational methodology to ensure consistent, repeatable results.

A staff report utilizing the data table (Table 4.1) will be reviewed every five years by the CMP Steering Committee and other appropriate constituent committees before updates to the System Performance Report. This more formalized process will enable the MPO to better track the data collection efforts, and keep committees and ultimately the Board more involved in the CMP.

Table 4.1 CMP Data Acquisition Plan

CMP Data	Definition	Coverage	Source	Freq of Updates	Last Updated	QA/QC	Agency Contact
Major Road Network							
Classification	e.g., collector, arterial, freeway	S	LRTP, TIP, & Comp Plan Amendments	As Needed	June 2007	Y	MPO
Laneage	2, 4, 6, etc.	S	Same	Same	Same	Y	Same
Configuration	divided, undivided, one way, etc.	S	Same	Same	Same	Y	Same
Alignment	GIS shape file	S	Same	Same	Same	Y	Same
Signalized Intersections							
Type, Location	signal location, timing, phasing	S	Hillsborough County	Every 5 years	In Progress	Y	Public Works Department
		S	City of Plant City	Every 5 years	Same	Y	Public Works Department
		S	City of Tampa	Every 5 years	Same	Y	Public Works Department, Trans. Division
		S	City of Temple Terrace	Every 5 years	Same	Y	Public Works Department
		S	FDOT District 7	Every 5 years	Same	Y	
Traffic Counts							
Type, Location	e.g., 24, 72 hour, hourly, 15 min. interval	S	FDOT Traffic Data CD	Annual	2006	Y	FDOT Transportation Statistics Office
	count station table, GIS layer, AADT, LOS	S	Hillsborough County-Level of Service Report	Annual*	2007	Y	Planning and Growth Management
		S	City of Tampa Inventory of Roadways	Annual	2007	Y	Public Works Department
		S	City of Plant City	Every 5 Years	2005	Y	Public Works Department
		S	City of Temple Terrace	Every 5 Years	N/A	Y	No major roads under its jurisdiction
Traffic Operations							
Additional Congestion Measures	Delays, Vehicular Queues, Operating Speed	C	Trip logs, time runs from GPS vehicles, ITS archive	As Needed	N/A	Y	Corridor Study Sponsors
ITS Network							
Inventory Type, Loc. or Alignment	ITS program, operation centers, monitoring	S	Hillsborough MPO ITS Master Plan	Every 5 years	2005	Y	ITS Steering Committee (MPO)
Crashes							
Location, rates, types	segments, intersections, vehicles, peds., bicycles	C	Hillsborough County	As Needed	As Needed	Y	Public Works Department, Joe Mischler
	For corridor studies	C	Florida Department of Highway Safety and Motor Vehicles (DHSMV); FDOT	As Needed	As Needed	Y	DHSMV, FDOT State Safety Office
		C	City of Tampa	As Needed	As Needed	Y	Carlos Martes (274-8828)
		C	City of Plant City	As Needed	As Needed	Y	Fred Baxter (707-7200)
		C	City of Temple Terrace	As Needed	As Needed	Y	Rod Cambridge (989-7118)
Transit Route Network							
Mode	bus, streetcar	S	HART, PSTA, Plant City	Annual	Nov. 2007	Y	HART Planning Department
Type	e.g., local, express	S	Same	Annual	Nov. 2007	Y	Same
Frequency	peak, off peak headway	S	Same	Annual	Nov. 2007	Y	Same
Span of Service	starting, ending times	S	Same	Annual	Nov. 2007	Y	Same
Alignments, Stops & Stations	GIS shape file	S	Same	Annual	In Progress	Y	Same
Stop or Station Amenities	shelters, benches, transfer center, etc.	C	Same	As Needed	As Needed	Y	Same
Park and Ride	lots and locations	S	Same	As Needed	As Needed	Y	Same
Financial Information	Operating Costs, Farebox Revenues	S	Same	Every 5 years	2004	Y	Same
Freight & Goods Movement							
Designated Truck Routes	freight routes and facilities, Tampa Bay	S	Hillsborough County-Truck Routes Map	Every 5 years	In Progress	Y	Planning and Growth Management
Classification Counts	counts by FHWA classification	C	FDOT District Seven	Every 5 years	2006	Y	Districtwide Traffic Count Program
Identified Freight Hot Spots	intersection/interchange freight hot spots	S	FDOT District Seven	Every 5 years	2006	Y	District Seven Planning Office
Rail Corridors	number of rail cars, tonnage, or truck equivalents	S	CSX and/or FDOT Rail Office	Every 5 years	N/A	Y	James Andrews, District 7
Bicycle & Off-Road Trails Networks							
Type	on-road bike lanes, shoulders, off-road trails	S	Cities of Plant City, Tampa, Temple Terrace , FDOT	Every 5 years	2001	Y	Verify with field survey or aerials
Alignment	GIS shape files	S	& Hillsborough County	Every 5 years	2001	Y	Same
Utilization	Counts, demographics, compliance w/ laws	S	Field surveys at Selected Locations	Every 5 years	2004	Y	Same
Type, Alignment	% of sidewalk coverage; GIS shape files	S	FDOT, Hills. Co., Plant City, Tampa, & Temple Terr.	Every 5 years	2004	Y	Verify with field survey or aerials
Utilization	Counts, demographics, compliance w/ laws	S	Field surveys at Selected Locations	Every 5 years	2004	Y	Same
Transportation Demand Management Program							
Area Covered	Service Area	S	Bay Area Commuter Services (BACS)	Every 5 years	2004	Y	Bay Area Commuter Services (BACS)
Services Offered	Carpool, vanpool, transit subsidies, etc.	S	Same	Every 5 years	2004	Y	Same
Utilization	# of patrons, Origins & Destinations	S	Same	Every 5 years	2004	Y	Same

Coverage Legend: (S) Systemwide (C) Specific Corridors * Reported annually but traffic counts for some roads are based on a growth factor applied to count from the previous year.

5.0 IDENTIFICATION AND EVALUATION OF STRATEGIES

5. Identification and Evaluation of Strategies
This component of the CMP includes the process for screening and evaluating congestion management strategies for potential effectiveness in addressing the identified problems.

5.1 CMP Strategies

A range of strategies have been identified and evaluated by the Hillsborough MPO as a means to manage congestion. In-depth screening and evaluation occurs in the course of corridor studies. The following section lists strategies and circumstances under which they may be practical solutions.

5.1.1 Transportation System Management and Operations

Transportation System Management (TSM) strategies are designed to improve traffic flow and safety through better management and operation of existing transportation facilities, and may include relatively low cost and quick responses. TSM strategies encompassed by the CMP include:

- Traffic signal improvements:
  - Signal equipment upgrades
  - Installation of pedestrian push-buttons
  - Timing and phasing
  - Signal optimization
  - Vehicle detection upgrade
  - Synchronization and Coordination
  - Advanced Traffic Management Systems (see ITS strategies)
- Data collection to monitor the performance of the system
  - Video cameras to detect and respond to traffic conditions
  - Travel time runs along corridors
- Signal management for special events
  - Timing and phasing for specific times
  - Allowing certain intersections to run uncoordinated when feasible
- Intersection improvements:
  - Geometry
  - Channelization
  - Additional turn lanes
  - Increased capacity for queue lengths
- Removal of freeway and arterial bottlenecks
  - Improve acceleration/deceleration lanes
  - Improve weaving sections

- Improve land and shoulder width
- Install adequate signs and markings
- Install ramp metering

Most jurisdictions continuously monitor their traffic operations and periodically optimize signal timings. For example, Tampa's Transportation Division routinely examines the timing and synchronization of traffic lights and other transportation control devices so as to minimize congestion and travel times.

Adjustments to signal timing and phasing to reduce delay represent potentially one of easiest solutions to implement, and therefore is one of the first considerations at the corridor level whenever signalized intersections are present. At the other end of the spectrum of ease of implementation, removing bottlenecks and introducing new turn lanes and intersection capacity is not feasible where right-of-way is constrained or cost-prohibitive.

5.1.2 Bicycle/Pedestrian Improvements

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

Bicycling can be improved by:

- Bicyclist/motorist awareness programs
- Improving bicycle signage and pavement marking
- Designated bicycle lanes
- Separate dedicated bicycle trails or paths

Walking improvements can be accomplished by:

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

5.1.3 Transit Operations

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

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

Operational improvements requiring more buses often involve trade-offs against higher ongoing costs, which a transit agency must sustain over time in its operating budget.

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

- New vehicles

- Better passenger amenities at bus stops such as:
  - Signage
  - Lighting
  - Seating
  - Shelters
  - Schedule information
  - Next bus arriving information delivered by Dynamic Message Signs (DMS), websites, wireless devices
  - Bus pull-out lanes
  - Safe, well-marked, illuminated and accessible park & ride lots

- Accessible pedestrian connections to bus stops such as:
  - Sidewalks
  - Crosswalks
  - Curb cuts and ramps
  - Landing pads for wheelchairs, scooters, and walkers

- Faster service via:
  - Signal prioritization
  - Queue jumper lanes
  - Dedicated bus lanes

5.1.4 Transportation Demand Management (TDM)

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

TDM strategies work best for areas in which there is a large concentration of commuters who generally have the same travel schedules. Large employers with well-defined shifts are a good target for TDM promotions. The existence of a TMO serving such areas is also important to market TDM services directly to employers and commuters.

5.1.5 Congestion Pricing

These strategies involve a price structure that imposes or varies toll rates or user fees based on time of day and level of congestion. They are most commonly used in congested corridors or facilities during peak periods of demand, diverting some trips to non peak periods or other less congested facilities.

Variable tolls can be imposed on bridges and toll roads with peak period volumes that exceed the capacity of the facility. High Occupancy Toll (HOT) lanes are a variation that allows single occupant vehicles to use High Occupancy Vehicle (HOV) lanes for a price. Congestion pricing can also limit access to highly congested zones such as downtowns. Special permits or zone licenses are required. Access controls and enforcement can pose implementation challenges for congestion pricing solutions.

5.1.6 Growth Management

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

- Right-of-Way dedication to create or fill in a grid of roads to disperse future trips;
- Exactions for on- and off-site improvements to roadway laneage, intersections, bus stops, sidewalks, and bikeways;
- Transportation impact fees to fund capacity or operational improvements in the vicinity of the development;

- Concurrency prohibitions against new development in the absence of adequate infrastructure; and

- Site and urban design regulations such as:
  - Access controls
  - Setbacks
  - Mixed land uses enabling large developments to capture certain trips internally.

Some jurisdictions employ strategies that promote the use of alternative modes through a mix of uses, greater density, less parking, and direct investment in transit, walking and/or biking. Further information on local government regulations and programs related to growth management are provided in Section 8.6.

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

5.1.7 Incident and Event Management

Incident management includes programs to detect and respond to incidents, accidents and events potentially impeding the flow of traffic. The use of ITS and other communications technology is often used to alleviate the problem and minimize congestion. For example, the Florida Department of Transportation (FDOT) District Seven office provides incident management along the state highway network in Hillsborough County. Specifically, the Road Rangers provide a fleet of service trucks patrolling Interstates and expressways to monitor incidents and clear disabled vehicles from travel lanes, remove roadway debris and assist the Florida Highway Patrol.

In a similar fashion, special events such as major league and college games, concerts and holiday celebrations with the potential to generate severe but short-term congestion are proactively managed via signal timing adjustments, extra law enforcement, and Dynamic Message Signs (DMS) to facilitate the flow of traffic to and from the event.

The effectiveness of such strategies depends on how quickly incidents are detected, responded to, and cleared, as well as the existence of traffic diversion plans to detour traffic around incidents or disperse traffic away from special events. Incident and event management works effectively when tied to ITS projects such as video monitoring and DMS operating within specific corridors or subareas.

5.1.8 Intelligent Transportation Systems (ITS)

ITS programs are an important component of the CMP. ITS is made up of a variety of communications and computer technologies focused on detecting and relieving congestion and improving safety within the transportation system by enabling drivers to make smart travel choices. ITS technology can communicate in real time to travelers

where congestion is occurring and providing information on alternative routes or modes can reduce the severity and duration of congestion. It can also communicate where an accident has occurred, alerting officials to request assistance.

Various agencies in Hillsborough County have deployed a number of ITS improvements and have others programmed for the future, including:

- Electronic toll collection (Sunpass)
- White enforcement lights to prevent red light running
- Traffic management centers operated by FDOT, Hillsborough County, and the City of Tampa/Tampa – Hillsborough Expressway Authority
- Freeway Management System:
  - Fiber optic cables
  - Dynamic Message Signage
  - CCTV monitoring
  - Traffic Detection Stations
  - Archived Data
- Arterial Traffic Management System:
  - Fiber optic cables
  - Video cameras
  - Incident detection
  - Dynamic Message Signage
- Transit Automatic Vehicle Location (AVL) to aid dispatching and provide bus arrival information to passengers

FDOT has taken a leadership role in the deployment of ITS infrastructures throughout Florida, including a Regional Transportation Management Center (TMC) also known as the Tampa Bay Sunguide Center. Located in the District Seven office, the Center provides freeway ITS management and is co-located with a dispatch center for state law enforcement agencies. The Center also communicates closely with the Tampa Bay 511 system that provides up-to-date traffic and transit information to the public and news media.

FDOT is implementing a Freeway Management System covering I-4, I-275, I-75, the Selmon Crosstown and Veterans Expressways and the North Suncoast Parkway. The system consists of vehicle speed/volume detection devices and CCTV monitoring by the Regional TMC. Traffic conditions and incidents are monitored around the clock by operators who dispatch Road Rangers and FDOT maintenance crews. The TMC also controls dynamic message signs to convey traffic information to motorists.

Local jurisdictions are also pursuing ITS projects. For example, Tampa's Arterial Surveillance Program monitors traffic conditions via a system of cameras. Signal controllers that are connected to a TMC can adjust timing and phasing remotely to alleviate congested intersections. Hillsborough County's system operates in a similar manner. The information gathered from these programs aid in reducing clearance times for accidents, and in the synchronization of traffic lights.

Section 8.4 summarizes the ITS Master Plan for Hillsborough County and its relationship to the CMP. Appendix C contains tables and maps that summarize the existing and planned ITS deployments.

The potential for implementing new or extending existing ITS deployments to congested corridors will be evaluated as additional corridor studies are completed.

5.1.9 Freight Strategies

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

Hillsborough County has designated an extensive truck route network but the MPO has not adopted strategies to reduce or mitigate the impact trucks have on congestion and vice versa. The MPO will analyze and compare the existing truck route network to congested corridors. Overlaying both networks will enable a comparison to be made, as another means to analyze the cause and effects of congestion within a specific corridor. This would also include major intersections and interchanges.

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

- Geometric improvements at intersections/interchanges;
- ITS/traffic information and incident management;
- Diversion of truck traffic to designated routes, by-passes, or to rail;
- Increased truck route signage and enforcement;
- Change freight delivery times during peak travel periods;
- Truck lane restrictions;
- Highway/railway crossing improvements; and

- Adding capacity/easing bottlenecks.

These strategies are appropriate to use at the corridor-specific level, but may also be applied to a system-wide level to understand the interrelationship between the CMP network and the regional freight network. Reference to the hot spots identified by the Regional Goods Movement Study will be helpful in applying strategies to specific corridors.

5.1.10 Additional Roadway Capacity

Where needed to alleviate existing or avoid future congestion, projects to add lanes or extend the system with new roadways are also part of the CMP. Such projects are appropriate if lower-cost, short-term strategies have been exhausted and/or a more in-depth corridor analysis shows that they would not be effective.

To maximize the useful life of investments in new capacity projects, they will be accompanied by the analysis and implementation of appropriate TSM, TDM and ITS strategies.

6.0 MONITORING STRATEGY EFFECTIVENESS

6. Strategy Effectiveness
This component involves data gathering, evaluation, and reporting on the effectiveness of the CMP strategies that have been implemented.

6.1 Evaluation and Performance of CMP Strategies

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

6.1.1 System-Wide Evaluation

The effectiveness of CMP strategy implementation will be monitored and reported at least every five years. The MPO staff, with oversight from the CMP Steering Committee, will be responsible for compiling the necessary data, conducting the performance evaluations and producing a user-friendly performance-based report easily understood by the public. The report will be a precursor to the updated LRTP document and follow the same format as the Congestion Management System Performance Report.

To track changes over time and the effectiveness of the CMP, the established systems level performance measures using the latest available data will be used. These measures will reflect the results of implemented strategies, and include:

- Vehicle miles traveled (VMT) by Roadway Level of Service (LOS);
- Number of Registered Carpools and Vanpools;
- Sidewalk and Bicycle Facility Miles per Roadway Centerline Miles;
- Bicycle and Pedestrian Crashes;
- Percent of Total Population within ¼ Mile of Transit Service;
- Percent of Transit Service by Headway;
- Transit Passengers per Revenue Mile;

- Transit Cost per Passenger Trip; and
- Transit Farebox Recovery.

Several other measures may be included as needed such as average travel time or speed and citizen input. This analysis will be conducted by the MPO staff or consultants and reviewed by the Steering Committee, other committees, and approved by the MPO Board. The System Performance Report will, at a minimum, document the changes that have occurred between performance reports. The list of CMP corridors will be updated, along with a discussion of any notable changes.

6.1.2 Corridor-Specific Level

Currently, six corridors have been studied and are therefore subject to strategy evaluation. As the CMP program develops, however, a "before and after" level of analysis will be conducted to determine whether the recommended strategies resulted in measurable improvements to the selected corridor(s). This "before and after" approach will vary from corridor to corridor and be based on the type(s) of strategies implemented. Furthermore, it will be important to conduct appropriate on-site field-work both prior to and after implementing any type of improvement(s) to the corridor(s).

The monitoring of CMP strategies for a specific corridor will require a set of evaluation measures to determine overall effectiveness. At a minimum, these should include the established corridor-specific performance measures:

- Corridor Weighted Volume to Maximum Service Volume Ratio;
- Percentage of Corridor Miles with On-Road Bicycle Facilities;
- Percentage of Corridor Miles with Sidewalks;
- Transit Passengers per Revenue Hour; and
- Transit Service Headway (Peak and Off Peak Periods).

There may also be the need for measures tailored for the specific corridor. For example, the implementation of intersection improvements in a specific corridor, such as new turn lanes and signalization, would require a set of evaluation measures to determine whether they contribute to a reduction in delay. MPO staff or consultants will conduct detailed field investigation to ascertain the changes that have occurred resulting from the CMP-related strategy. Table 6.1 provides a generic example of a corridor-specific evaluation process, which could be applied to both before and after the implementation of specific strategies. In some cases, it may be difficult to quantify the effectiveness of certain strategies within a corridor. Therefore, the MPO should obtain the most applicable information as possible and make appropriate qualitative judgments, while documenting all information.

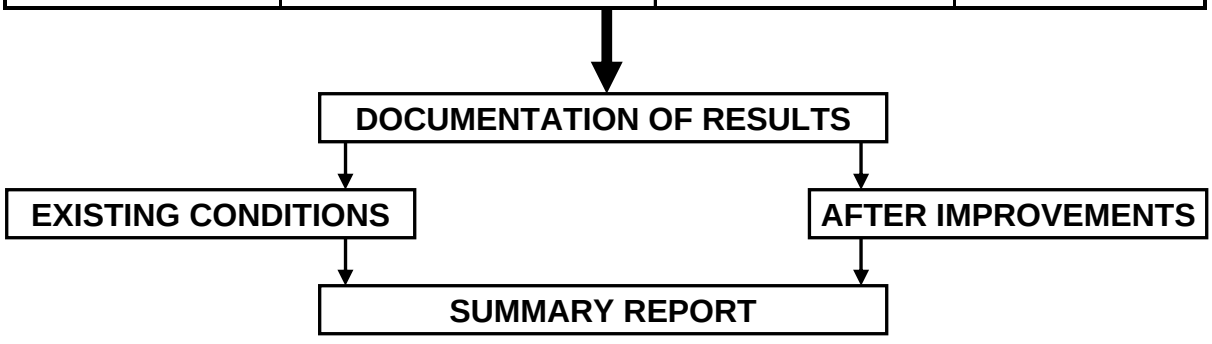
Section 9.0 provides a template for future corridor studies, including strategy effectiveness.

6.2 Feedback and Modification of CMP Strategies

As CMP strategies are implemented and evaluated on a regular basis, the MPO may find it appropriate adjust specific strategies. In some cases, it may also be necessary to add new strategies to enable the CMP to become more effective. Any feedback and modifications to the CMP will be coordinated with the MPO's CMP Steering Committee. Proposed changes will be reviewed by the appropriate committees and ultimately by the MPO Board for final review and approval. In general, formal modifications will occur during the periodic update to the CMP System Performance Report document.

Table 6.1: Evaluation of Strategy Effectiveness (Generic Corridor Example)

CMP Strategy	Description	Evaluation Measures	Data Collection Process
Bicycle/Pedestrian --On-road bike lanes	Addition of on-road bicycle lanes to both sides of corridor	-Bicycle level of service -Bicycle volume estimates	-Bicycle counts, field investigation
Transit Operations --Expanded service	Increased transit service during AM and PM peak periods	-Transit ridership -Travel time -Cost changes -Station/stop delay	-Ridership counts -Bus travel time monitoring -Rider surveys
ITS --Advanced traveler information	Installation of ITS electronic message signs	-Average travel time -Traffic volume change on neighboring roadway segments	-Trip logs by travelers and technical staff -Traffic counts
Roadway Capacity --Additional capacity	Addition of one travel lane in both directions of roadway	-Level of Service -Average travel time -Traffic volume change -Crashes	-Traffic counts -Travel time surveys -Crash analysis



7.0 IMPLEMENTATION AND MANAGEMENT

7. Implementation and Management
This component requires an implementation plan to ensure timely development and delivery of CMP products, and to maintain a high level of quality control. CMP activities, procedures and techniques are also updated as needed.

7.1 Implementation Process

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

7.2 Implementation Responsibilities

7.2.1 CMP Steering Committee

The MPO initiated the development of a CMS process in 1995 by developing a work plan, which included the establishment of a CMS (now CMP) Steering Committee. The Steering Committee provides feedback to staff and the MPO Board to assist in both developing and updating the CMP. The Committee consists of local government planners, engineers, TMO-related representatives, law enforcement staff, and other key transportation stakeholders in the region. The main goal of the Committee is to serve as the formal body to help guide the development of the CMP program. Figure 7.1 provides a listing of the agencies which are included in the Steering Committee:

Figure 7.1: CMP Steering Committee

AAA Auto Club South	Hillsborough County Planning and Growth Management
Bay Area Commuter Services	Hillsborough County Planning Commission
City of Plant City	Hillsborough County Public Works
City of Tampa	Hillsborough County Sheriff's Department
City of Temple Terrace	New North Transportation Alliance
Florida Department of Environmental Protection	Pasco County MPO
Florida Department of Transportation	Pinellas County MPO
Florida Highway Patrol	School District of Hillsborough County
Hillsborough Area Regional Transit	Tampa Bay Regional Planning Council
Hillsborough County Emergency Dispatch	Tampa Downtown Partnership
Hillsborough County Engineering	USF Center for Urban Transportation Research
Hillsborough County Environmental Protection	Westshore Alliance

Specifically, the Steering Committee meets periodically to:

- Review results of system-wide and corridor performance monitoring;
- Update and refine adopted performance measures;

- Recommend congested corridors for more in-depth study;
- Review and comment on corridor study results and recommendations;
- Recommend funding allocations for congestion management projects; and
- Pursue implementation through participating agencies.

This last point is of particular importance to the CMP. In selecting a corridor to be studied, the CMP Steering Committee is potentially selecting a project for future implementation. Therefore, it is important to secure a commitment from implementing agencies to follow through with pursuit of projects that may emerge from a corridor study.

7.2.2 Other MPO Committees

There are four constituent MPO Committees that also make recommendations to the MPO. These committees have a role in reviewing and commenting on the CMP and include the:

- Citizens Advisory Committee
- Technical Advisory Committee
- Bicycle/Pedestrian Advisory Committee
- ITS Committee
- Policy Committee, a subset of the MPO Board

7.2.3 MPO Board

The MPO Board receives all CMP System Performance reports and Corridor Studies for their endorsement. Recommendations regarding specific projects and funding allocations are also presented for the Board's approval. Formal recommendations made by the MPO committees and CMP Steering Committee are presented to the Board for their review and approval.

7.2.4 Public Participation in the CMP

The MPO holds public workshops when conducting corridor studies and public participation is an important component to the CMP. As the CMP is developed and updated, input from the citizenry of Hillsborough County will continue to be incorporated into future System Performance reports and individual corridor studies. Residents, workers and visitors to Hillsborough County will be asked to:

- Help identify where and when congestion occurs

- Provide feedback on strategies
  - As they are proposed and
  - After they are implemented

A representative from the public or the Citizen's Advisory Committee will be invited to join the CMP Steering Committee as a means to better integrate public participation into the CMP. Additionally, the implementation of a feedback mechanism will be considered to enable citizens the opportunity to comment and make suggestions regarding congestion and other traffic-related concerns. For example, an online congestion reporting form will be considered for the MPO's website to enable citizens the opportunity to identify congested corridors or specific problematic locations on a continuous basis as they occur. This information, once collected and validated by the MPO, could serve as input to additional corridor-specific CMP studies and priorities. Table 7.1 provides an example of an on-line congestion reporting system.

Table 7.1 Online Congestion Reporting Form (Example)

Please describe the congested problem and location.

Description:

Location (street name/intersection):

What time of day does the congestion occur, and how often?

What is the main cause of the congestion?
(e.g., accidents, signals, turn lane storage, site-distance, etc.)

What recommendations or measures do you think need to be done to alleviate the congestion at this location(s)?

7.2.5 Annual CMP Implementation Report

On an annual basis, the MPO will provide a summary of accomplishments related to congestion management to all constituent committees, the Board and the public. The summary report will describe all progress related to CMP-related projects and programs, such as bicycle/pedestrian improvements, transit route/service improvements, and TSM/ITS improvements. Capacity projects with CMP components will also be monitored and included in the summary report. Coordination will take place with member agencies responsible for implementing CMP strategies and projects. A separate form will be developed by the MPO to use for tracking purposes. Overall, an implementation report is meant to provide the overall state of the CMP system, benefits realized and status of on-going efforts.

8.0 INTEGRATION INTO PLANNING PROCESS

The CMP is closely integrated into the planning processes at both the MPO and regional level. This section provides an overview of the interrelationships that exist between the CMP and a variety of activities and tasks carried out by the MPO.

8.1 MPO Planning Process Integration

The CMP is an integral part of the MPO planning process, including the Long Range Transportation Plan (LRTP), the Transportation Improvement Program (TIP), the Public Participation Plan (PPP) and the Unified Planning Work Program (UPWP). As displayed in Figure 8.1, the CMP is coordinated concurrently with all major MPO planning processes. Integrating the CMP into all MPO programs enables the process to be more effective and efficient. It also ensures a multimodal approach is implemented in corridor studies and roadway improvement projects.

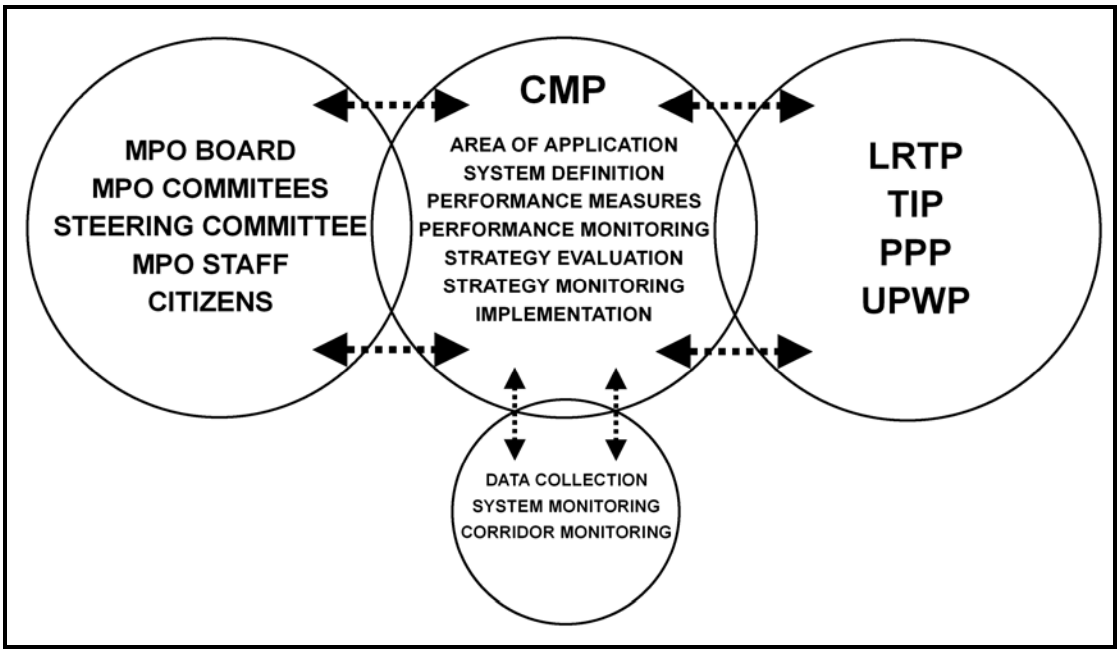
8.1.1 Long Range Transportation Plan

The 2025 LRTP provides a comprehensive set of goals and principles closely linked to congestion management strategies and improvements. Specifically, they include:

- **Principle 1.1:** Relieve Traffic Congestion and Minimize Travel Time;
- **Principle 2.1:** Maximize Access to the Transportation System and Improve the Mobility of the Transportation Disadvantaged;
- **Principle 2.2:** Decrease Reliance on Single-Occupancy Vehicles;
- **Principle 2.3:** Support an Integrated System with Efficient Connections between Transportation Modes;
- **Principle 2.4:** Enhance the Efficient Movement of Freight;
- **Principle 3.1:** Provide for Safer Travel for All Modes of Transportation, Including Walking, Bicycling, Transit and Auto;
- **Principle 3.3:** Promote Sensible Growth Patterns;
- **Principle 4.1:** Encourage Land Development Patterns that Promote Transportation Efficiency;
- **Principle 4.2:** Develop System Performance Standards and Criteria for Establishing Priorities to Ensure Optimum Use and Efficiency; and
- **Principle 4.4:** Emphasize the Use of Existing Transportation Systems to Avoid Unnecessary Capacity Improvements.

In addition, the LRTP provides a comparison between the improvements in the adopted Cost Affordable Plan with the Existing plus Committed (E+C), or "No-Build" transportation network. The comparison demonstrates that without further improvements of both highway and transit modes, the transportation system will be overwhelmed by future automobile travel, causing degradation in travel time, air quality, safety, user costs, energy consumption, and travel congestion.

Figure 8.1: CMP and MPO Planning Process Integration



Overall, the 2025 LRTP serves as a long-term guide to the development of CMP projects and programs. The 2025 LRTP adopted in 2004 prioritizes $25 million in federal funding allocated to the Transportation Management Area (TMA) for the 20-year period implementation of CMP strategies. It will provide policy guidance for the inclusion of congestion management strategies in future capacity projects. Future updates to the LRTP will ensure that the list of Cost-Feasible project priorities addresses congested corridors, and they will be scored based on the ability to reduce or minimize congestion. Additionally, in the next LRTP update, a summary of the CMP System Performance Report will be included to provide guidance, along with a synopsis of system-wide and corridor-specific performance.

8.1.2 Transportation Improvement Program (TIP)

When developing the TIP, the results of the adopted CMP are considered during the annual ranking of candidate projects. Specifically, the evaluation of projects receiving Surface Transportation Program (STP) funding are directly linked to the CMP. The scoring criteria and types of projects funded integrate congestion management directly to how projects are selected to receive TIP funding. Appendix D contains the STP

Project Evaluation form used for the TIP process. Five out of the 14 evaluation criteria relate to congestion management including:

- Consistency with CMP studies
- Congestion Relief
- Congestion Prevention
- Traveler Alerts for Hazards and Delays
- Incident Management

In addition, the following CMP-related measures are used to prioritize roadway corridors in the TIP process:

- **Safety:** Proximity to top accident locations;
- **Traffic Congestion Relief:** Volume/Capacity Ratio;
- **Emergency Evacuation/Access:** Proximity to emergency access problem or designated evacuation route;
- **Major Activity Center Access:** Improvement of direct access to major activity center;
- **Regional Connectivity:** Improvement to interurban routes between activity centers; and
- **Goods Movement:** Facilitates the movement of products and freight.

System monitoring and data collection are important components to the CMP. Each TIP update will include a summary review of system performance and implemented strategies. CMP requirements will also be considered for all projects which add capacity in Hillsborough County. This will ensure that effective travel demand and operational strategies for new and existing facilities are being implemented for all federally-funded TIP projects.

8.1.3 Public Participation Plan (PPP)

The PPP provides a comprehensive process for public involvement in the MPO planning process. The next update to the PPP will specifically reference the public's role in providing input to the development of the CMP. As stated in Section 7.0, CAC participation in the CMP Steering Committee and/or an online Congestion Reporting system will be considered as a means for citizens to become more directly involved in the CMP (see Section 7.2.4).

8.2 West Central Florida MPO Chairs Coordinating Committee

The West Central Florida MPO Chairs Coordinating Committee (CCC) Regional Congestion Management System (RCMS) Performance Report was adopted in 2007. It provides an assessment of transportation mobility information and trends of the defined regional transportation facilities in the West Central Florida region (Hillsborough County, Citrus County, Hernando County, Manatee County, Pasco County, Pinellas County, Polk County, Sarasota County) (Figure 8.2).

The RCMS Performance Report provides the regional perspective on congestion management, integrating all CMP related information and programs of the eight counties and six MPO's (Figure 8.3). A set of performance measures were specifically developed and integrated into each respective county and MPO area (Table 8.1). The report also provides a synopsis of interviews conducted for each agency, assimilating their respective CMP-related information into the regional process. All modes of transportation (regional roadways, public transportation, pedestrian facilities on regional roadways, multiuse trail facilities, regional travel demand services, strategic intermodal systems, regional ITS corridors) are defined and analyzed in the report. Overall, the RCMS provides a regional framework to guide local counties and MPO's with their individual CMPs.

8.3 Integration with Transit Planning

Transit is a critical component of the multimodal CMP. The MPO utilizes transit operational strategies and performance measures based on the local and express bus route network. Transit providers such as HART participate in the CMP by providing:

- Performance data
- CMP Steering Committee membership
- Assessments of transit-related congestion management strategies
- Coordination with transit-related highway strategies

The MPO will continue the integration of transit planning data and strategies at both the system-level and corridor-specific levels of the CMP. The relationship between the CMP and transit planning process will be strengthened through periodic system monitoring and integration of the most up-to-date version of the transit networks and Transit Development Plan projects.

Figure 8.2: West Central Florida CCC Regional CMP Network

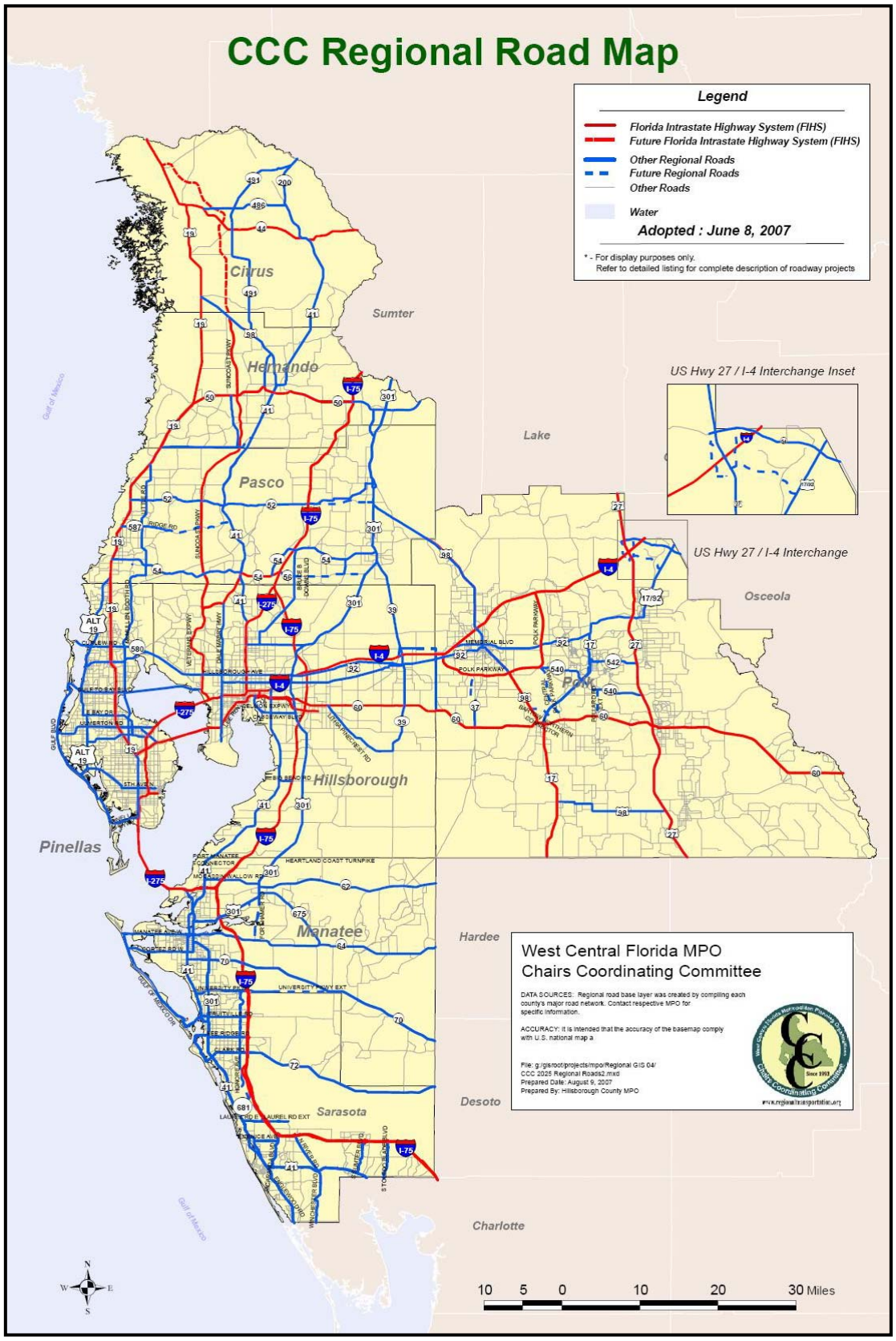


Figure 8.3: West Central Florida CCC Congested Corridors

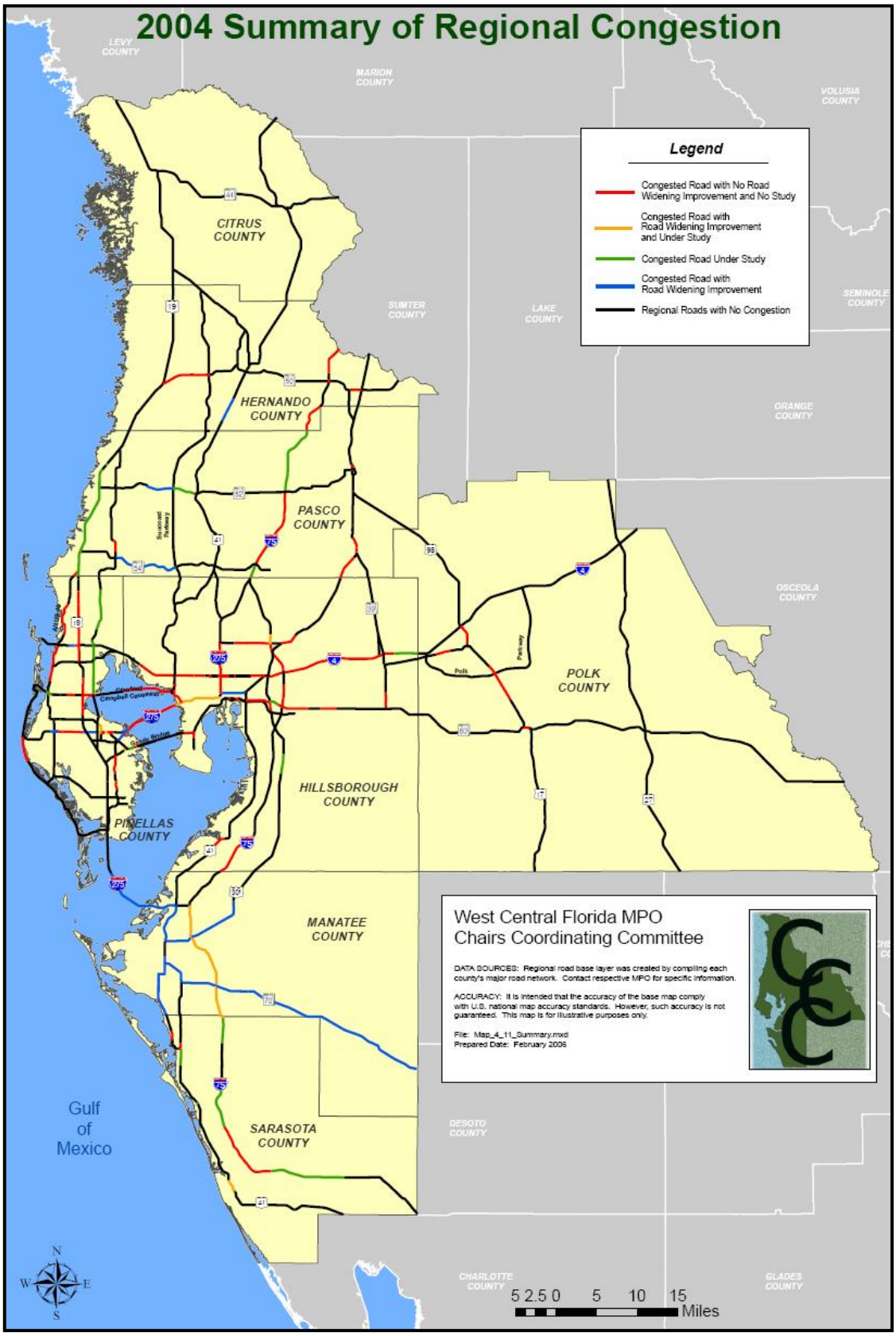


Table 8.1: Summary of Regional Performance (2004)

Performance Measures (1)	Citrus	Hernando	Hillsborough	Pasco	Pinellas	Polk	Sarasota	Manatee
ROADWAY PERFORMANCE MEASURES								
Regional Centerline Miles	78.02	125.53	293.99	196.30	203.54	218.17	86.39	101.74
Weighted Average V/MSV Ratio on Regional Road Network	n/a	0.74	0.90	0.77	0.97	1.21	1.01	1.17
Annual Vehicle Miles Traveled on Regional Road Network (in millions)	626.88	783.44	5538.24	1787.74	3302.37	2215.47	2020.95	1546.42
Average Vehicle Occupancy (2)	1.50	1.40	1.50	1.40	1.50	1.50	1.50	1.50
Lane Miles on Regional Road Network	255.77	431.44	1,380.97	717.80	943.16	938.34	388.64	273.20
One-Way	0.00	1.59	1.29	0.00	1.93	0.00	0.00	0.00
Undivided	0.00	89.26	108.97	162.28	34.75	47.03	0.00	53.30
Divided	255.77	222.16	547.81	394.93	763.73	625.50	190.53	219.90
Freeway and Toll Facilities	0.00	118.42	722.91	160.58	142.75	265.82	198.10	0.00
Number of Crashes (3)	581	511	13,172	1,995	7,205	4,247	1,740	2,199
INTERMODAL ACCESS PERFORMANCE MEASURES								
Weighted Average V/MSV Ratio, SIS Roads in the region	n/a	0.82	0.92	0.87	1.00	1.15	1.05	1.12
GOODS MOVEMENT PERFORMANCE MEASURES								
Weighted Average V/MSV Ratio, Truck Routes on Regional Roads	n/a	0.74	0.90	0.77	0.98	1.21	1.01	1.13
Annual Truck Vehicle Miles Traveled on Regional Roads (in millions) (4)	9.42	29.24	145.10	52.12	53.53	101.87	54.60	43.32
Tonnage of Freight Moved Through Area Ports (in millions)	0.00	0.00	48.86	0.00	0.11	0.00	0.00	8.40
Passengers Moved Through Area Ports (in millions) (5)	0.00	0.00	8.46	0.00	0.55	0.00	0.53	Cargo Only
Port Capacities (Twenty-Foot Container Equivalency Units) (5)	0.00	0.00	17,277	0.00	Passenger Only	0.00	0	8,528
PUBLIC TRANSPORTATION PERFORMANCE MEASURES								
Regional Centerline Miles with Transit Services	0.00	22.60	113.64	51.34	150.02	31.96	43.76	9.92
Percent of Regional Centerline Miles with Transit Services	0.00%	18.00%	38.65%	26.15%	73.71%	14.65%	50.66%	9.75%
Percent of Land Area within 1/4 Mile of Bus Routes	0.00%	4.08%	16.13%	6.14%	57.46%	8.16%	36.44%	27.80%
Percent of Population within 1/4 Mile of Bus Routes	0.00%	18.04%	48.03%	24.54%	68.25%	47.10%	24.77%	87.41%
Annual Fixed Route Transit Passenger Trips	0	78,320	8,831,306	550,000	9,701,063	1,853,091	1,777,966	1,359,854
Annual Transit Passenger Trips on Regional Transit Routes	0	29,382	699,236	319,545	3,904,589	n/a	241,003	45,869
Annual Transit Revenue Service Miles on Regional Transit Routes	0	87,562	674,485	367,003	3,302,209	n/a	214,257	47,198
Annual Transit Revenue Service Hours on Regional Transit Routes	0	5,118	338,518	20,403	214,854	n/a	13,817	2,990

Performance Measures (1)	Citrus	Hernando	Hillsborough	Pasco	Pinellas	Polk	Sarasota	Manatee
PUBLIC TRANSPORTATION PERFORMANCE MEASURES								
Transit Passenger Trips per Revenue Service Hour	0.00	5.74	2.07	15.66	18.17	n/a	17.44	15.34
Transit Revenue Service Hours Per Day on Regional Transit Routes	0.00	19.61	1,297.00	78.17	823.20	n/a	52.94	11.46
Paratransit Ridership (6)	135,128	112,701	2,191,243	307,948	2,500,291	134,644	543,684	456,244
PEDESTRIAN FACILITY PERFORMANCE MEASURES								
Regional Centerline Miles with Sidewalks	19.98	2.33	44.00	38.74	146.49	27.29	6.38	27.95
Percent of Regional, Centerline Miles with Sidewalks	25.61%	2.45%	26.12%	24.81%	80.08%	16.85%	9.05%	35.20%
Percent of Regional, Transit Centerline Miles with Sidewalks	n/a	7.38%	25.96%	43.27%	81.81%	44.92%	14.57%	100.00%
MULTI-USE TRAIL FACILITY PERFORMANCE MEASURES								
Miles of Existing Regional Multi-Use Trails (7)	50.48	48.78	38.38	50.34	61.71	37.34	6.00	0.00

Notes:
(1) n/a – data not readily available
(2) Based on data obtained from FDOT 2002 Highway Data Source Book
(3) Based on analysis of 2003 crashes on the State Roadway System
(4) Truck VMT, calculated based on the information obtained from FDOT, does not include the following regional roads:
  a. Gulf Boulevard (SR 688 SR 60), McMullen Booth Road, SR 584 (from Causeway Boulevard to Alternate US 19), 49th Street (from Ulmerton Road to US 19)
  b. Veterans Expressway and Suncoast Parkway
  c. Polk Parkway
(5) Based on data obtained from FDOT
(6) Based on data obtained from 2004 Annual Operation Report Florida Commission for the Transportation Disadvantaged
(7) Miles of regional multi-use trails are based on the adopted regional long range transportation plan

8.4 Integration with ITS

In 2002, the MPO initiated a process with the Florida Department of Transportation (FDOT) to develop a 20-year ITS Master Plan for Hillsborough County. The main goal of the plan was to document the area's ITS deployment and needs, and serve as a guide for the allocation of Federal and State funding for future ITS projects. The ITS Master Plan for Hillsborough County was developed collaboratively with an ITS Steering Committee in 2004. A major function of the ITS Steering Committee and Master Plan is to ensure that projects are consistent with the Tampa Bay Regional and National ITS architecture. The Plan identifies issues and objectives as shown in Table 8.2. The highlighted rows relate directly to congestion management.

The MPO will be updating the ITS Master Plan in the near future. To ensure a closer linkage between the CMP and ITS Master Plan, as the Plan is updated and new ITS projects are identified, the CMP will be reviewed for potential applicability of ITS strategies. Proposed ITS projects will receive a higher score if they address a congested corridor identified through the CMP.

CMP corridor studies will refer to the existing and planned ITS deployments to ensure that recommended improvements are coordinated with and take advantage of ITS systems in place or coming on line.

More detailed information regarding ITS evaluation criteria, market packages and projects are provided in Appendix C.

Table 9.2: Relationship between CMP and ITS Master Plan

Issue	Objective
Traffic Congestion	• Reduce traffic congestion and improve mobility
	• Better utilize capacity of parallel arterial roadways.
	• Reduce parking problems and traffic congestion near schools, major attractions
	• Reduce Vehicle Trips and Air Pollution
	• Better management of special events
Traffic Safety	• Improve safety and flow efficiency
	• Improve Pedestrian Safety
	• Efficient and compatible truck routing.
Mass Transit System Enhancement	• Improve efficiency/convenience for use of transit operations
	• Better coordination of transit/rail agencies
Traveler Information	• Provide most current information to motorists and pedestrians
	• Promotion of Ridesharing, Multimodal Transportation, TMAs
	• Assist in making major attractions easier to locate
Technology	• Enhanced data gathering at signalized intersections
	• Maintain currency in ITS technology
Incident Management	• Faster and improved Incident Management response
	• Traffic Diversion ability in case of incident
Emergency Management	• Reduce Fire/EMS response time
	• Better emergency management response and evacuation coordination
	• Enhanced cooperation, communication, interoperability between agencies
Coordination	• Inter-operability between existing and planned ITS project
	• Logical and complimentary extension of existing and programmed deployments
	• Regional cooperation, communication, interoperability of ITS between counties

8.5 Integration with NEPA Planning Process and Environmental Justice

Including congestion management strategies in Project Development and Environment (PD&E) and related corridor studies will ensure that the CMP is integrated into the evaluation of proposed alternatives for state and federal projects under the National Environmental Policy Act of 1969 (NEPA). As alternatives and recommendations are developed for a particular corridor, the MPO will seek to incorporate CMP strategies such as operational management, transit, bicycle/pedestrian and other travel demand reduction strategies. CMP strategies will be incorporated into both Build and No-Build alternatives. In addition, CMP performance measures will be considered as measures of effectiveness when congestion is part of the purpose and need statement.

The MPO has analyzed the potential impacts of the 2025 LRTP on Environmental Justice (EJ) areas. Through the integration of the CMP with the LRTP process, full consideration will be given to the implementation of bicycle and pedestrian facilities and transit enhancements in EJ areas. During every LRTP update, a review and overlay of corridors proposed for CMP strategies and disadvantaged population areas will be conducted. This process will ensure that when CMP strategies are considered, their impact on disadvantaged populations can be identified and potential inequities addressed. Additionally, the MPO will proactively provide opportunities for disadvantaged populations to have input into the process of updating the LRTP.

8.6 Relationship to Local Land Use and Growth Management Requirements

Hillsborough County and its municipalities have established planning and growth management policies and programs to address congestion on local roadways. Table 8.3 summarizes the tools currently used by each jurisdiction in an effort to reduce traffic congestion. Appendix E contains a detailed description of the respective policies and programs for each local government.

8.7 Economic Impacts of Congestion

The economy of the Tampa Bay region is significantly transportation-dependent. Over the next 20 years, there will be a major challenge to accommodate the growth in both freight and general traffic on the CMP transportation network in Hillsborough County. Despite currently planned improvements and CMP-related congestion measures, freight and general traffic growth will significantly impact the MPO's ability to maintain the transportation system and grow the county's economy and quality of life.

The Texas Transportation Institute (TTI), an arm of Texas A&M University, produces an annual report entitled the Urban Mobility Report (2007 Urban Mobility Report). This report estimates congestion problems in metropolitan areas of the nation, and provides an overall assessment of long-term congestion trends. The information is based upon defined performance measures applied to each metropolitan area. The report also offers a description of congestion improvement strategies for implementation. Specific mobility data results are provided for the Tampa-St. Petersburg Metropolitan Statistical Area (MSA) (see Appendix F). The most recent findings for the MSA are for 2005, as shown in Table 8.4.

Table 8.3: Local Land Use and Growth Management Requirements

Policy, Program or Regulation	Jurisdiction					
	Temple Terrace	Plant City	Tampa	Hillsborough County	Tampa Bay RPC	State
Stand-Alone Programs						
Concurrency Management System	X	X	X	X*		
Proportionate Fair Share Ordinance	P	X	P	X		
Access Management	X	X	X	X		X
Parking Management			P			
Review of Developments of Regional Impact	X	X	X	X	X	
Land Use Policies						
Density Bonuses	X		X	X		
Mixed Land Use Categories	X	X	X	X		
Downtown Redevelopment w/ Pedestrian Focus	X		X			
Capital Assessment Areas		X				
Transportation Concurrency Exemption Area (TCEA)	X		X			
Corridor Preservation				X		
Project Location Restriction (Based on Road Access)			X			
Specific Exactions						
Transit Stop Accommodation	X	X	X	X		
Bicycle Facilities	X	X	X	X		
Pedestrian Facilities	X	X	X	X		
Proximity to Transit Stops	X					
Sidewalk LOS Minimum	X					
Roadway Improvement		X	X	X		
Right-of-Way Dedication		X	X	X		
Impact Fees		X	X	X		

X = Adopted
P = Proposed
* = In Hillsborough County Adequate Public Facilities is synonymous with Concurrency.

Table 8.4: Economic Impacts of Congestion to Tampa –St. Petersburg MSA

Total Delay (person-hours)	56,203,000
Delay per Peak Traveler (person-hrs)	45
Total Cost*	$1,005,000,000
Cost per Peak Traveler*	$809
Annual Excess Fuel Consumed (gallons)	35,281,000

* Estimated at $14.60 per hour of person travel and $77.10 per hour of truck time
Source: Texas Transportation Institute: 2007 Urban Mobility Report.

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

- Loss of productivity due to the economic consequences and smaller labor pools resulting from commuting time/costs
- Safety costs
- Vehicle wear and tear
- Inventory costs of larger stocks required by congestion-related unreliability in shipment times
- Costs to passengers of leaving early for a destination because of congestion-related unreliability in travel times

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

As part of the development of future CMP System Performance reports and Corridor Studies, the MPO will invite more business and economic development involvement, including the freight community. These entities will be provided the opportunity to serve on the CMP Steering Committee, or the Steering Committee will meet periodically with the Regional Freight Stakeholder Committee, as a means to become integrated. Bringing all sectors of business into the development of the CMP will enable the MPO to have a greater understanding of congestion issues in Hillsborough County and the region.

9.0 CORRIDOR STUDY GUIDELINES

CMP corridor studies are generally conducted in response to significant congestion along specific corridors identified in the System Performance Report. Congested corridors are ranked in the periodic System Performance Reports, and individual corridors are selected by the CMP Steering Committee based on:

- Severity of Congestion;
- Duration of Congestion;
- Inability to widen a roadway due to constraints;
- Absence of any programmed improvements;
- Ability to improve conditions given available resources to implement congestion management strategies; and
- Commitment by implementing agency to follow-through with improvements.

Corridors may also be selected from projects listed in the TIP that constitute lower-cost improvements to congested corridors. These may be selected for evaluation by the MPO and Steering Committee in consultation with the implementing agency.

This section provides an outline for developing future corridor and/or sub-area studies associated with the CMP. It offers a step-by-step outline, integrating the current methodology used by the MPO, as well as additional components which reflect federal guidance for CMPs.

9.1 Corridor Study Outline

1. Study Purpose

a. Process for selection of corridor
   i. Ranking from latest CMP System Performance Report
   ii. Summary of CMP Steering Committee discussion
b. Goals and objectives to address in corridor study

2. Define Corridor or Sub-Area

a. Corridor area of influence (travel-shed)
b. Study area boundary and description
c. Corridor description
   i. Attributes (facility type(s), laneage, etc.)
   ii. Service by alternative modes
   iii. Parallel Corridors and Adjacent transportation network

iv. Adjacent land uses and development

3. Stakeholder Involvement

a. CMP Steering Committee
b. MPO constituent committees (Board, TAC, etc.)
c. Public agencies and departments (cities, county, state, transit, TMA's, commuter services)
d. Civic groups (neighborhood, chambers of commerce, non-profits, etc.)
e. Business community
f. Affected property owners
g. Interested citizens and advocacy groups

4. Problem Definition

a. Identification from the System Performance Report
b. Document baseline (current) performance based on:
    i. Collection of data using adopted Performance Measures (roadway, transit, bicycle, pedestrian, crashes, etc.)
    ii. Collection of corridor-specific data and field survey (e.g., travel times and delay)
    iii. Input from public
c. Data interpretation and analysis of causes of congestion in study area
d. MPO, CMP Steering Committee, and public review
e. Summary of findings in a Problem Statement
    i. Identify criteria for screening strategies

5. Screening of CMP Strategies

a. Menu of appropriate corridor-specific CMP strategies based on System Performance Report and/or other strategies specified in FHWA guidelines:
    i. Actions that implement demand management (growth management, congestion pricing, SOV reduction, etc.)
    ii. Improvements to traffic operations
    iii. Public transportation improvements
    iv. Alternative modes (bicycle/pedestrian, potential freight shift to rail)
    v. Transportation system optimization (TSM, ITS)
    vi. Additional system capacity when necessary
b. Screening of strategies based on criteria
    i. Expected changes in performance measures
    ii. Indirect effects
    iii. Benefit(s) to cost(s) comparison and analysis
    iv. Community/study area impacts

v. Evaluation table/comparison matrix

c. MPO, CMP Steering Committee, and public review

d. Selected strategy(ies)

6. Expected Results

a. Summary of proposed strategy(ies) which address FHWA guidelines

b. Summary of estimated impacts based on performance measures

i. Congestion reduction (V/MSV)
ii. Increased bicycle facilities and usage
iii. Increased pedestrian facilities and usage
iv. Increased transit service and passengers
v. Other screening criteria

7. Action Plan

a. Prioritization of strategies

b. Funding Plan

i. Funding process
ii. Potential Funding sources
iii. Participation (federal, state, local, private)

c. Implementation Responsibilities

d. Implementation Schedule

8. Evaluation of Strategy Effectiveness

a. Post implementation monitoring

i. Overview of process for the assessment of strategy effectiveness
ii. Timeframe of assessment(s) (periodic)
iii. Monitoring responsibilities (MPO, public agencies, etc.)
iv. Feedback mechanism

b. Strategy effectiveness comparison

i. Baseline conditions
ii. Expected results
iii. Actual results

c. Summary report

i. Summary of results vs. baseline
ii. Review of impacts
iii. Findings
iv. Recommendations for future CMP strategies and corridor studies

d. MPO, CMP Steering Committee, and public review

APPENDIX A

A-1: FHWA Congestion Management Process Checklist

A-1: FHWA Congestion Management Process (CMP) Checklist

Introduction

The questions are grouped according to seven key components of an established CMP. As the CMP is intended to be integrated into the overall metropolitan planning process, many of these questions could be asked as sub-parts of a Long Range Transportation Plan agenda item on a typical certification review agenda. Others may fit well into a Transportation Improvement Program (TIP) agenda item or NEPA discussion, as well. By asking these questions as part of other certification review agenda topics, FHWA/FTA will be solidifying the message that we intend the CMP to not be a standalone process (as was the CMP in many cases), but a fully integrated element of the overall transportation planning process.

This checklist was developed by Tamara Christion of the FHWA Florida Division and is offered as a resource. Comments may be directed to her at 850-942-9650 ext.3032.

1). Area of Application

This section refers to the geographic area to which CMP functions and the analysis will be applied. It is the area where congestion levels will be monitored and congestion management strategies evaluated and implemented.

Questions: How is the CMP a systematic process for managing congestion? (500.109)

_____Does the MPO have a CMP in place? Does the CMP address and/or include: ___A description of the area, network, and modes covered by the CMP? ___Include highways, transit, and the movement of people and goods? ___New and existing facilities eligible for federal funding; ___Travel demand reduction strategies (reduce SOV travel); and ___Operational and management strategies (improve existing system efficiency)

(23 USC 134(i)(3) and 23 CFR 450.320(c) and 23 CFR 500.109)

2). System Definitions (modes & network)

The transportation "system" defined to be included in the CMP functions and analysis. It includes the modes and network to be monitored in the CMP.

Questions:

Does the CMP provide the following types of information? ___Methods to monitor and evaluate the transportation and multimodal system performance based on defined parameters. This monitoring and evaluation includes a

program for data collection and system performance monitoring to define the extent and duration of congestion, to help determine the causes of congestion, and to evaluate the efficiency and effectiveness of implemented actions (500.109(3));

___Alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet State and local needs, including the following (500.109(4)):

___Transportation demand management measures;

___Growth Management;

___Congestion Pricing;

___Traffic Operational Improvements;

___Public Transportation Improvements;

___ITS Technologies; and

___Additional System Capacity (where necessary)

3). Performance Measures

This section provide basis for evaluating the transportation system operating conditions and identifying the location and severity of congestion. The performance measures provide the mechanism for quantifying the level of congestion on the transportation system. These measures may also be used to evaluate the effectiveness of implemented congestion management strategies.

Questions:

___Has the region established performance measures for measuring and monitoring congestion as part of the CMP? What are they and how are they used?

How does Transportation System Management and Operations and the ITS architecture link to the CMP?

How is the CMP process documented? How are the results of the CMP documented?

What is the role of decision makers and elected officials in the CMP process? How are they kept informed and what is their involvement?

4). Performance Monitoring Plan

This section is the mechanism for collecting the data needed to quantify the performance measures and track congestion over time. The monitoring plan specifies such things as: data to be collected, frequency of data collection, data collection locations, data collection responsibilities, data analysis techniques, database management requirements and performance reporting.

Questions:

How is the CMP process carried out? Is there a CMP committee or other coordinating group? Who is involved in the CMP process?

To what extent has the CMP been integrated into the metropolitan transportation planning process, including the Metropolitan Transportation Plan and the Transportation Improvement Program? (23 CFR 450.320(a))

How are agencies/persons responsible for transportation operations and public transit involved in the CMP? What is the role of the public transit agency and persons/agencies responsible for operations in the CMP?

How does the CMP link to the NEPA process?

5). Identification & Evaluation of Strategies

This section is the process within CMP for screening and evaluating congestion management strategies for potential effectiveness in addressing the identified congestion problems. This component can function at either a system-wide or corridor/sublevel of analysis and provide guidance in selecting strategies, actions and policies required to manage congestion. In essence, this component answers questions on how effective specific strategies could be and at what cost.

Questions: Where the addition of general purpose lanes is determined to be an appropriate strategy, how is explicit consideration given to incorporating appropriate features to facilitate future demand management and operational improvement strategies that will maintain the functional integrity of those lanes? (500.109)

In TMAs designated as nonattainment for ozone or carbon monoxide, does the CMP provide an appropriate analysis of reasonable travel demand reduction and operational management strategies for the corridor in which a project that will result in a significant increase in capacity for SOV's is proposed to be implemented with Federal funds? How is this analysis documented?

Does the CMP include the following evaluation mechanisms of the efficiency and effectiveness of implemented strategies based on the established performance measures (500.109(6)): ___Documented Process for periodic assessment; ___Results provided to decision makers to provide guidance on selection of effective

strategies for future improvement.

6). Monitoring Strategy Effectiveness

This component will gathers data, evaluate and report on the effectiveness of the strategies that have been implemented. This component should provide valuable feedback on the effectiveness of the specific strategies/actions to alleviate congestion.

Questions:
Does the CMP include the identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies?

How is the CMP effective in enhancing transportation investment decisions and improving the overall efficiency of the metropolitan area's transportation systems and facilities? (23 CFR 450.320(d))

Is the CMPs' effectiveness evaluated periodically as part of the metropolitan planning process? (23 CFR 450.320(d)) (Is there an evaluation of the effectiveness of implemented strategies/projects, in terms of the area's established performance measures?)

7). Implementation and Management
The entire CMP process requires an **implementation plan** to coordinate CMP activities, ensure timely development and delivery of CMP products and maintain a high level of quality control. Coordination and cooperation among multiple agencies is required to ensure that the CMP functions properly and provides the desired information. This component can also function to periodically review CMP activities, procedures and techniques and update the CMP process as new technologies become available.

Questions:

To implement the CMP, are the following things identified (500.109(5)):
___Implementation Schedule; ___Implementation Responsibilities; and
___Possible Funding Sources for each strategy or combination of strategies

APPENDIX B

B-1: 2005 CMS Corridors

B-1A: Roadway Database Fields, GIS Schema Diagram, and Highway LOS Methodology

B-2: HART Transit Routes (Local and Express)

B-3: Bicycle and Pedestrian Facilities

B-4: Regional Freight and Hot Spot Maps

B-1: 2005 CMS Corridors

On	From	To	Length (in Miles)	Weighted V/MSV Ratio
30th St./ Bruce B. Downs Blvd.	Fowler Ave.	Cross Creek Blvd.	8.1	1.67
40th St.	Hillsborough Ave.	Busch Blvd.	2.6	0.93*
56th St.	Hillsborough Ave.	Fowler Ave.	4.0	1.16
Armenia Ave.	Platt St.	Tampa Bay Blvd.	2.6	0.93*
Bearss Ave.	Dale Mabry Hwy.	Bruce B. Downs Blvd.	5.3	1.14
Benjamin Rd.	Hillsborough Ave.	Waters Ave.	2.0	0.95*
Bloomingdale Ave.	US Hwy. 301	Lithia Pinecrest Rd.	5.8	1.19
Busch Blvd.	Dale Mabry Hwy.	30th St.	4.7	1.14
Causeway Blvd.	50th St.	US Highway 301	3.2	1.32
Courtney Campbell Causeway	Pinellas County	Memorial Hwy.	11.4	1.24
Dale Mabry Hwy.	Bay to Bay Blvd.	Ehrlich Rd.	11.4	1.24
Ehrlich Rd.	Gunn Hwy.	Dale Mabry Hwy.	4.1	1.24
Fletcher Ave.	Dale Mabry Hwy.	Morris Bridge Rd.	8.9	1.30
Fowler Ave	30th St.	Interstate 75	4.6	1.11
Gandy Blvd.	Westshore Blvd.	Bayshore Blvd.	2.4	1.04
Gunn Hwy.	Sheldon Rd.	Lutz Lake Fern Rd.	5.7	0.95*
Hillsborough Ave.	Countryway Blvd.	Dale Mabry Hwy.	6.2	1.06
Hillsborough Ave.	40th St.	Orient Rd.	2.5	1.10
Himes Ave.	Hillsborough Ave.	Busch Blvd.	2.8	0.97*
Howard Ave.	Bayshore Blvd.	Columbus Dr.	2.9	0.95*
Interstate 275	Howard Franklin Bridge	Interstate 4	5.3	1.51
Interstate 275	Interstate 4	Fowler Ave.	5.3	1.14
Interstate 4	Interstate 275	50th St.	6.3	1.27
Interstate 4	McIntosh Rd.	Polk County	11.8	1.17
Interstate 75	State Rd. 60	Interstate 4	4.4	1.10
Kennedy Blvd.	Memorial Hwy.	Ashley St.	4.1	1.02
Lithia Pinecrest Rd.	State Rd. 60	FishHawk Blvd.	6.9	1.18
Livingston Ave.	Bearss Ave.	Sunset Ln.	4.3	1.07
Lumsden Rd.	Providence Dr.	Valrico Rd.	4.0	1.01
Lynn Turner Rd.	Linebaugh Rd.	Ehrlich Rd.	3.0	1.30
Martin Luther King Jr. Blvd.	Dale Mabry Hwy.	Nebraska Ave.	3.3	1.00
Memorial Hwy.	Hillsborough Ave.	Kennedy Blvd.	5.5	1.24
State Rd. 60/Adamo Dr.	Channelside Dr.	Kingsway Rd.	10.6	1.09
State Rd. 674	Interstate 75	US Hwy. 301	3.0	0.96*
Swann Ave.	Dale Mabry Hwy.	Bayshore Blvd.	2.5	0.32*
US Hwy. 301	Interstate 4	Harney Rd.	2.0	0.72*
Van Dyke Rd.	Gunn Hwy.	Darby Ln.	4.4	1.31
Waters Ave.	Armenia Ave.	Rowlett Park Dr.	2.6	0.79*
Westshore Blvd.	Gandy Blvd.	Azeele St.	3.4	1.90

**These 10 corridors from the 2001 CMS performance report were specifically selected to show trends in congestion even though they have weighted V/MSV ratios that were less than 1.0 in 2004.*

B-1A: Roadway Database Fields, GIS Schema Diagram, and Highway LOS Methodology

The fields below are used for the analysis of congested corridors in the CMP. The columns in the table are displayed from left to right, and include a sample segment of a congested corridor. The column shaded in yellow and denoted with an asterisk (LOS in Base Yr./LOS_BASE) reflects the information specifically displayed in Figure 3.2 of the CMP report.

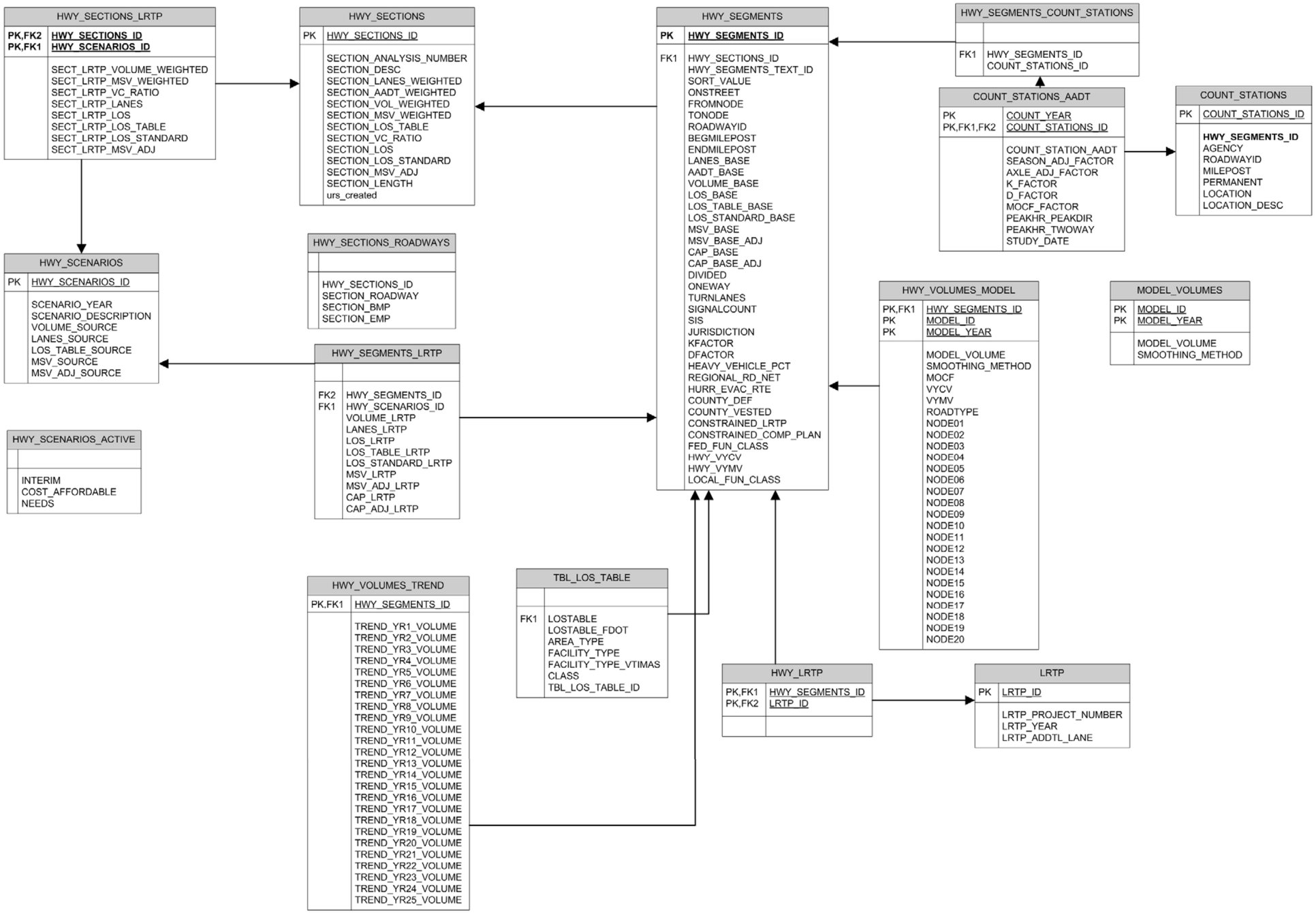
GIS ID Fields	GIS ID Fields			Roadway Name	From	To
HWY_SECTIO	HWY_SEGMEN	HWY_SEGM_1	SORT_VALUE	ONSTREET	FROMNODE	TONODE
411	886	SRB093:030	1107	I-275	M L KING BLVD	HILLSBOROUGH AVE

By Jurisdiction	Beginning Milepost	End Milepost	Lanes in Base Year	AADT in Base Year		*LOS in Base Yr.	FDOT LOS Table	FDOT LOS Standards	Max. Service Volume
ROADWAYID	BEGMILEPOS	ENDMILEPOS	LANES_BASE	AADT_BASE	VOLUME_BAS	LOS_BASE	LOS_TABLE_	LOS_STANDA	MSV_BASE
SRB093	1.364	2.262	6	133761	7136	F	UrFwy2	D	105800

	MSV Base Cap	Lane Types				Width of Turn Lanes	Traffic Signal		Roadway Jurisdiction	FDOT K-Factor
MSV_BASE_A	CAP_BASE	CAP_BASE_A	DIVIDED	ONEWAY	FREEWAY	TURNLANES	SIGNALCOUN	SIS	JURISDICTI	KFACTOR
1.000	120200	1.000	0	0	1	0	0	H	SR	0.093

FDOT D-Factor	Percent Commercial	On Regional System?	Hurricane Route?			2025 Fiscal Constrained			
DFACTOR	HEAVY_VEHI	REGIONAL_R	HURR_EVAC_	COUNTY_DEF	COUNTY_VES	CONSTRAINE	CONSTRAI_1	HWY_VYCV	HWY_VYMV
0.550	6.000	Y	Y	X	X	6F	00-00	0.000	0.000

B-1A: Roadway Database and GIS Schema



B-1A: Highway LOS Methodology

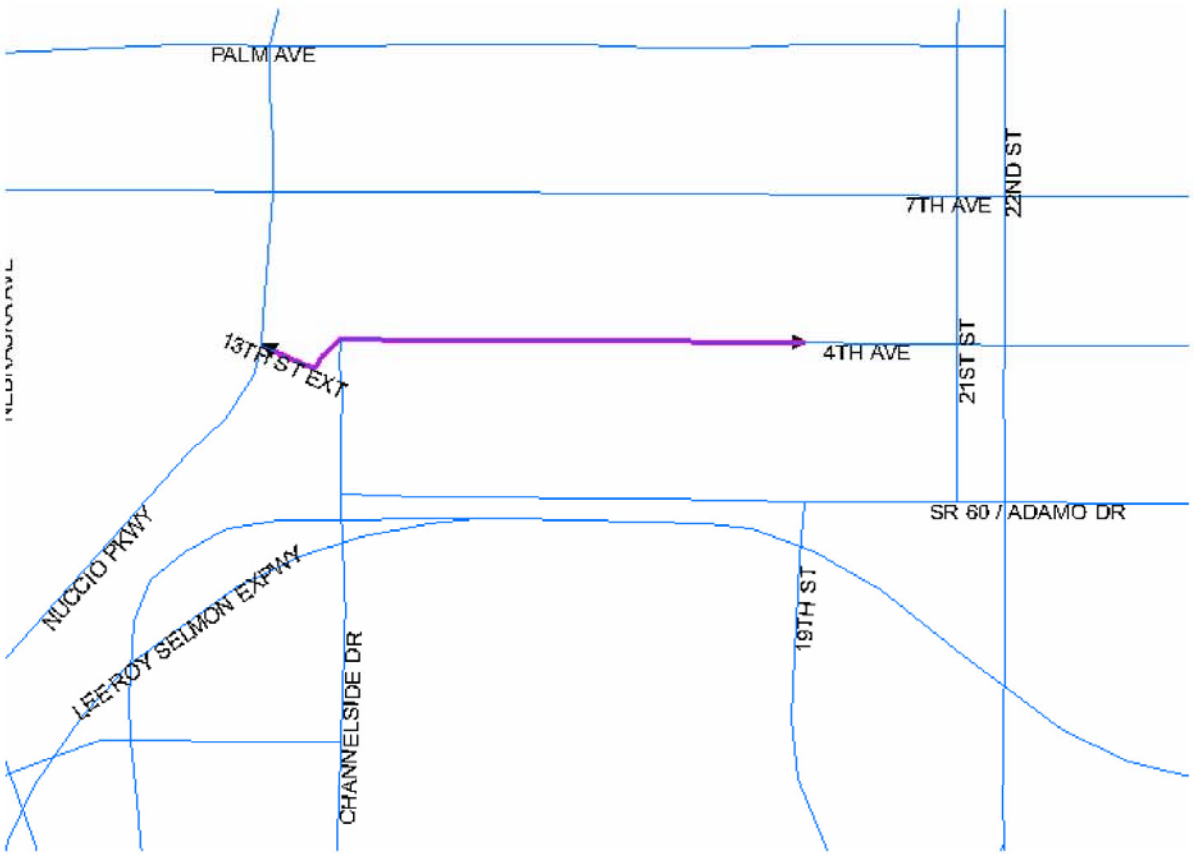
Highway LOS

- For Highway LOS, the fundamental, indivisible unit is a segment.
- Data is collected at the segment level

- One or more segments are combined to form a section.
- Segment data is aggregated to create data for sections.

- The map above isolates 4 segments that comprise 1 section.
- Listed below are some of the attributes of the segments.

	SECTION	ONSTREET	FROMNODE	TONODE	ROADWAYID	BEGMILEPOST	ENDMILEPOST
▶	4TH AVE: (CHANNELSIDE DR -to-NUCCIO PKWY)	13TH ST EXT	4TH AVE	NUCCIO PKWY	TA4730	0	0.098
	4TH AVE: (CHANNELSIDE DR -to-NUCCIO PKWY)	4TH AVE	CHANNELSIDE DR	15TH ST	TA4730	0.098	0.258
	4TH AVE: (CHANNELSIDE DR -to-NUCCIO PKWY)	4TH AVE	15TH ST	17TH ST	TA4730	0.258	0.41
	4TH AVE: (CHANNELSIDE DR -to-NUCCIO PKWY)	4TH AVE	17TH ST	19TH ST	TA4730	0.41	0.562



- This is the section that is composed of the 4 segments shown on the previous slide.
- It appears on the LOS reports as “4TH AVE: (CHANNELSIDE DR -to-NUCCIO PKWY)”

Analysis Section ID: 893

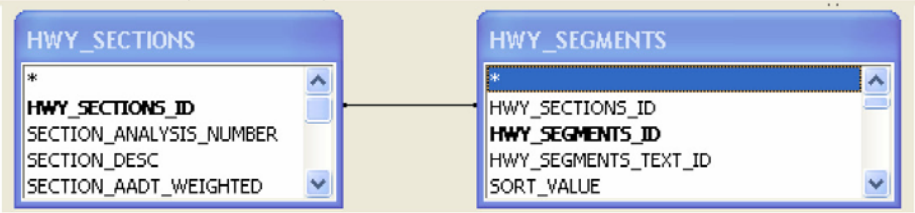
WHITING ST: (ASHLEY ST -to-MERIDIAN ST)

Segment
TA4650:010 - WHITING ST: (ASHLEY ST -to- TAMPA ST)
TA4650:100 - WHITING ST: (BRUSH ST -to- MERIDIAN ST)
TA4650:020 - WHITING ST: (TAMPA ST -to- FRANKLIN ST)
TA4650:030 - WHITING ST: (FRANKLIN ST -to- FLORIDA AVE)
TA4650:040 - WHITING ST: (FLORIDA AVE -to- MARION ST)
TA4650:050 - WHITING ST: (MARION ST -to- MORGAN ST)
TA4650:060 - WHITING ST: (MORGAN ST -to- PIERCE ST)
TA4650:070 - WHITING ST: (PIERCE ST -to- JEFFERSON ST)
TA4650:080 - WHITING ST: (JEFFERSON ST -to- NEBRASKA AVE)
TA4650:090 - WHITING ST: (NEBRASKA AVE -to- BRUSH ST)

- The graphic above is taken from one of the LOS reports.
- It shows the relationship of one section being made up of one or more segments.
- A field will be added to the segment table that identifies the order of the segments in the section.

Highway Segment Table

Field Name	Data Type	
HWY_SECTIONS_ID	Number	Section identifier to which this segment belongs.
HWY_SEGMENTS_ID	Number	Unique segment identifier (1-9999)
HWY_SEGMENTS_TEXT_ID	Text	Unique segment identifier seen on LOS report ie.TA4730:040
SORT_VALUE	Number	Sort field for report
ONSTREET	Text	Segment street name
FROMNODE	Text	Intersecting street at start of segment
TONODE	Text	Intersecting street at end of segment
ROADWAYID	Text	Route Identifier
BEGMILEPOST	Number	Beginning mile post
ENDMILEPOST	Number	Ending mile post
LANES_BASE	Number	Lanes you would see if you were driving today
AADT_BASE	Number	Current AADT
VOLUME_BASE	Number	Current Volume (Peak)
LOS_BASE	Text	LOS of current year
LOS_TABLE_BASE	Text	Code that identifies area type, facility type, class
LOS_STANDARD_BASE	Text	LOS at standard
MSV_BASE	Number	Maximum Service Volume
MSV_BASE_ADJ	Number	Maximum Service Volume adjustment [Daily_x]-([daily_x]*[MSV_BASE_ADJ]) = MSV wh
CAP_BASE	Number	Physical Capacity
CAP_BASE_ADJ	Number	Physical Capacity adjustment [Daily_e]-([daily_e]*[CAP_BASE_ADJ]=Physical Capacity
DIVIDED	Yes/No	Is segment divided? (Y/N)
ONEWAY	Yes/No	Is segment one way (Y/N)
TURNLANES	Number	Are there turn lanes on this segment?
SIGNALCOUNT	Number	Number of traffic signals on this segment.
SIS	Text	SIS faciltiy code
JURISDICTION	Text	agency that has jurisdiction
KFACTOR	Number	Standard K Factor as defined by FDOT
DFACTOR	Number	Standard D Factor as defined by FDOT
HEAVY_VEHICLE_PCT	Number	% of AADT that is heavy vehicles
REGIONAL_RD_NET	Text	Is segment part of regional road network?
HURR_EVAC_RTE	Text	Is segment a hurricane evacuation route?
COUNTY_DEF	Text	
COUNTY_VESTED	Text	
CONSTRAINED_LRTP	Text	Is segment constrained by LRTP?
CONSTRAINED_COMP_PLAN	Text	Is segment constrained by Comp Plan?
FED_FUN_CLASS	Text	Federal functional class
HWY_VYCV	Number	Volume smoothing parameter
HWY_VYMV	Number	Volume smoothing parameter
LOCAL_FUN_CLASS	Text	Local functional class



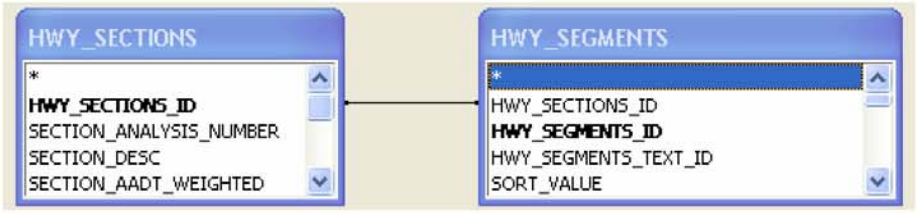
- The field, HWY_SEGMENTS_ID, uniquely identifies each segment.
- The field, HWY_SECTIONS_ID, links the segment(s) back to the parent section record.
- For each section record in HWY_SECTIONS, there can be many segment records in HWY_SEGMENTS.
- HWY_SECTIONS should be the same for each scenario and the base year.

Highway Section Table

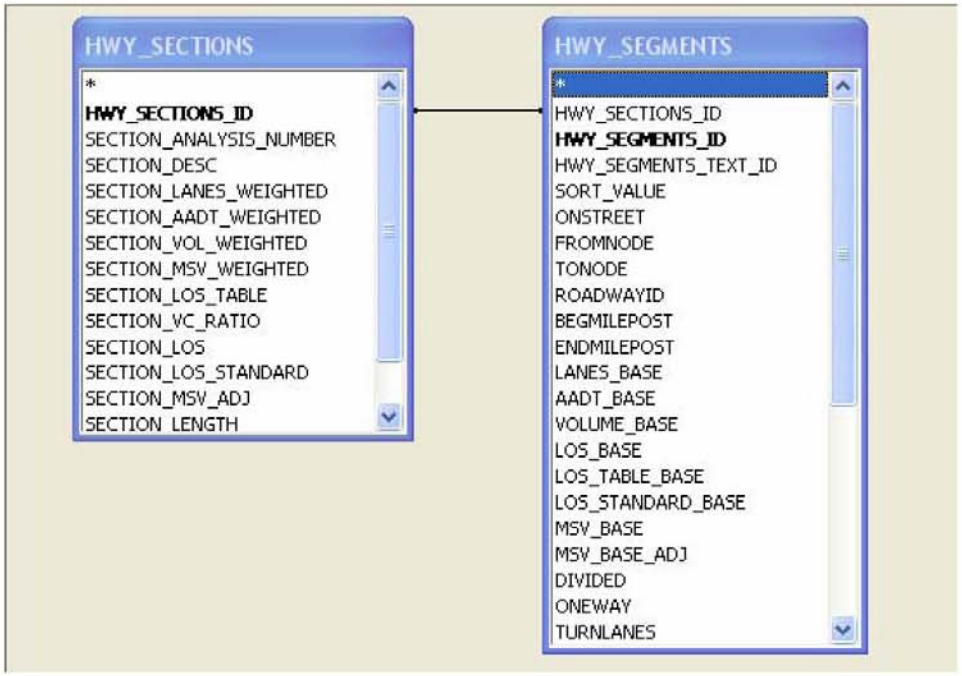
HWY_SECTIONS : Table

Field Name	Data Type	Description
HWY_SECTIONS_ID	Number	Unique section identifier (1-9999)
SECTION_ANALYSIS_NUMBER	Number	Segment identifer for the report(s)
SECTION_DESC	Text	Street name of section with starting and ending intersecs
SECTION_LANES_WEIGHTED	Number	Predominant # of lanes from children segments
SECTION_AADT_WEIGHTED	Number	Weighted average of AADT from children segments
SECTION_VOL_WEIGHTED	Number	Weighted average of Volume used to calculate the LOS – daily, peak hour, or peak hour peak direction
SECTION_MSV_WEIGHTED	Number	Weighted average of MSV from children segments
SECTION_LOS_TABLE	Text	Code that identifies area type, facility type, class
SECTION_VC_RATIO	Number	SECTION_VOLUME divided by SECTION_MSV
SECTION_LOS	Text	LOS of section
SECTION_LOS_STANDARD	Text	LOS at standard
SECTION_MSV_ADJ	Number	Maximum Service Volume adjustment
SECTION_LENGTH	Number	Length in miles of section

- Field names were prefaced with "SECTION_ " to clearly distinguish between like fields in HWY_SEGMENTS.
- The field, HWY_SECTIONS_ID, uniquely identifies each section.
- Fields in red box are calculated from data in the children segments.



917 parent section records 2405 children segment records



- These two tables display conditions for segments and sections for the current year.
- The number of lanes in HWY_SEGMENTS (LANES_BASE) is the number of lanes you would see if you were driving the segment during the current or base year.
- The field, VOLUME_BASE in HWY_SEGMENTS is the peak volume for the current or base year.
- The number of records in each table **will not change** unless there is a change in segmentation.
- These two tables provide the answers if you wanted to query the current status/conditions of the network.
- The LOS fields in HWY_SECTIONS are calculated from the LOS fields in HWY_SEGMENTS. If something changes in the LOS fields in HWY_SEGMENTS, the LOS fields in HWY_SECTIONS must be updated.

Scenarios: What If..?

- Scenarios are created to answer questions like: Calculate the LOS using all MPO LRTP projects and the three following volume scenarios: the current volume, the 2015 volume predicted by the model, and finally, the 2015 trend analysis volumes."

- A separate scenario can be created to answer each of these questions.
- Each scenario is one record in HWY_SCENARIOS.
- Scenario parameters are stored in HWY_SCENARIOS so a user can remember how the scenario was constructed.

HWY_SCENARIOS : Table

	Field Name	Data Type	
🔑	HWY_SCENARIO_ID	Number	Unique scenario identifier (1-9999)
	SCENARIO_YEAR	Number	Scenario year (2005, 2006, etc.)
	SCENARIO_DESCRIPTION	Text	Scenario Description
	VOLUME_SOURCE	Text	Base year, Model, Trend, etc.
	LANES_SOURCE	Text	Base year, FDOT or Local WP
	LOS_TABLE_SOURCE	Text	Source of changes to area type, facility type
	MSV_SOURCE	Text	Base year, FDOT, Local Standard
	MSV_ADJ_SOURCE	Text	Source of changes to MSVs

HWY_SCENARIOS : Table

	HWY_SCENARIO_ID	SCENARIO_YEAR	SCENARIO_DESCRIPTION	VOLUME_SOURCE	LANES_SOURCE	LOS_TABLE_SOURCE
	9	2009	Data from Table a2009 imported from alldata.mdb	table a2009	table a2009	table a2009
	15	2015	Data from Table a2015 imported from alldata.mdb	table a2015	table a2015	table a2009
	20	2025	2025 Cost Affordable Alternative: 25h25CAi	Model 2015	MPO LRTP	Base

Each time a scenario is created:

- LRTP volume and lane data for a segment is appended to HWY_SEGMENTS_LRTP along with the unique scenario id, HWY_SCENARIOS_ID
- LRTP segment data is aggregated and appended to HWY_SECTIONS_LRTP with the unique scenario id, HWY_SCENARIOS_ID
- If there is no LRTP segment data for an existing section, a blank record is added to HWY_SECTIONS_LRTP .
- The number of records in HWY_SECTIONS_LRTP should always equal the number of records in HWY_SECTIONS.

Scenario Segments

HWY_SEGMENTS_LRTP : Table

Field Name	Data Type	
HWY_SEGMENTS_ID	Number	Link to Unique segment identifier (1-9999)
HWY_SCENARIOS_ID	Number	Link to Unique scenario identifier (1-9999)
VOLUME_LRTP	Number	Volume for this segment for this scenario
LANES_LRTP	Number	Lanes for this segment for this scenario
LOS_LRTP	Text	LOS for this segment for this scenario
LOS_TABLE_LRTP	Text	Area type, facility type, class code for this segment for this scenario
LOS_STANDARD_LRTP	Text	Standard for this segment for this scenario
MSV_LRTP	Number	MSV for this segment for this scenario
MSV_ADJ_LRTP	Number	MSV adjustment for this segment for this scenario

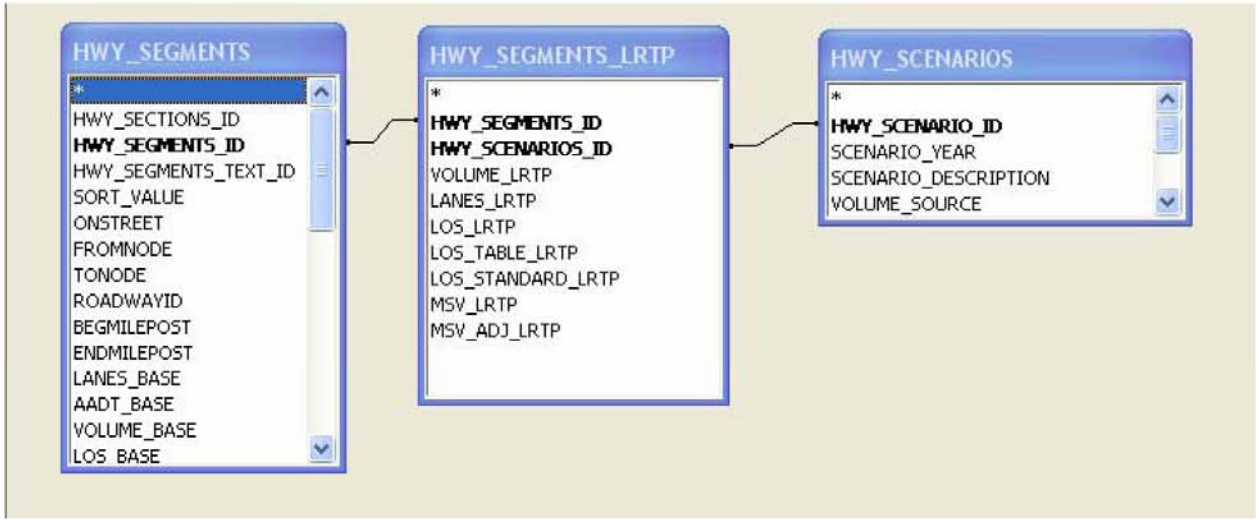
- Each record is tagged with HWY_SEGMENTS_ID and HWY_SCENARIOS_ID.
- Values for the other fields in this table can come from many sources.
- Values in VOLUME_LRTP can come from the model, regression analysis, or current year counts or volumes developed for another scenario.
- Values in Lanes_LRTP can include all, part, or none of the LRTP or lane values developed for another scenario.
- The facility type, area type definition of a segment can come from existing conditions in the segment table, a change based on the LRTP, or values developed for another scenario.
- Once these fields are set, routines will calculate the LOS fields (LOS_LRTP, MSV_LRTP, MSV_ADJ_LRTP)

Scenario Sections

HWY_SECTIONS_LRTP : Table

	Field Name	Data Type	
🔑	HWY_SECTIONS_ID	Number	Link to HWY_SECTIONS (1-9999)
🔑	HWY_SCENARIOS_ID	Number	Link to Unique scenario identifier (1-9999)
	SECT_LRTP_VOLUME_WEIGHTED	Number	Calculated Weighted Vol from LRTP segment
	SECT_LRTP_MSV_WEIGHTED	Number	Calculated MSV from LRTP segment
	SECT_LRTP_VC_RATIO	Number	Calculated Weighted Vol/Calculated MSV
	SECT_LRTP_LANES	Number	Predominant lanes from LRTP segment
	SECT_LRTP_LOS	Text	Calculated LOS from LRTP segment
	SECT_LRTP_LOS_TABLE	Text	Predominant area type, facility type code from LRTP segment
	SECT_LRTP_LOS_STANDARD	Text	Predominant LOS standard from LRTP segment
	SECT_LRTP_MSV_ADJ	Number	Calculated MSV adj from LRTP segment

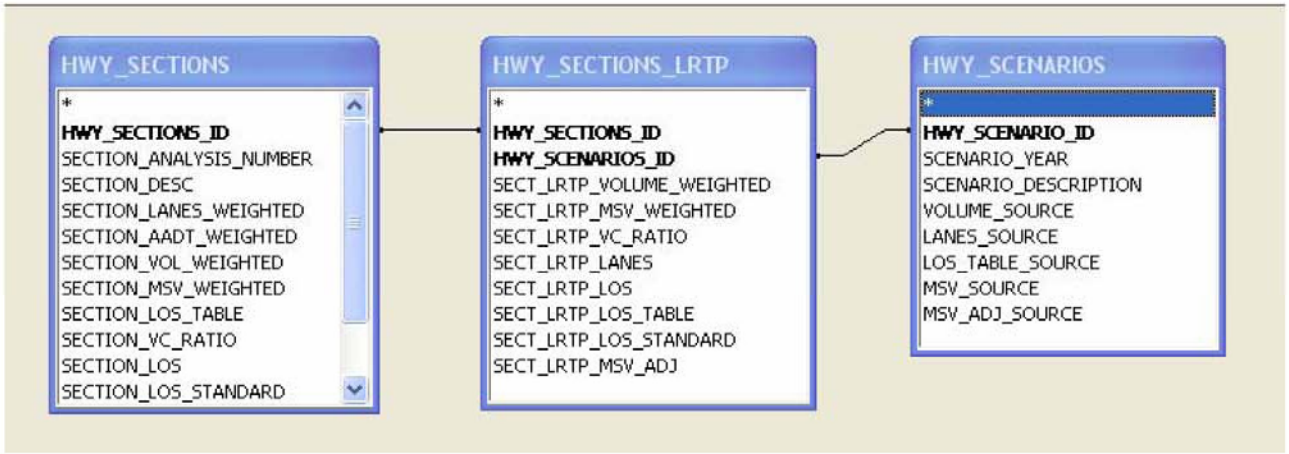
- When the scenario is created, for each record in HWY_SECTIONS, HWY_SECTIONS_ID is appended, along with scenario id.
- All other fields in this table are populated by the LOS calculation routines.
- These are the same routines that calculate LOS for the scenario segments.



- The relationship of HWY_SEGMENTS and HWY_SEGMENTS_LRTP is shown above.

SCENARIO_DESCRIPTION	ROADWAYID	BEGMILEPOST	ENDMILEPOST	AADT_BASE	VOLUME_LRTP	LANES_BASE	LANES_LRTP	LOS_BASE	LOS_LRTP
Data from Table a2009 imported from alldata.mdb	TA4730	0	0.098	8387	13311	2	2	D	F
Data from Table a2009 imported from alldata.mdb	TA4730	0.098	0.258	3040	8873	2	2	C	D
Data from Table a2009 imported from alldata.mdb	TA4730	0.258	0.41	3040	5904	2	2	C	D
Data from Table a2009 imported from alldata.mdb	TA4730	0.41	0.562	3040	7298	2	2	C	D
Data from Table a2015 imported from alldata.mdb	TA4730	0	0.098	8387	14013	2	2	D	F
Data from Table a2015 imported from alldata.mdb	TA4730	0.098	0.258	3040	9519	2	2	C	D
Data from Table a2015 imported from alldata.mdb	TA4730	0.258	0.41	3040	6817	2	2	C	D
Data from Table a2015 imported from alldata.mdb	TA4730	0.41	0.562	3040	7682	2	2	C	D

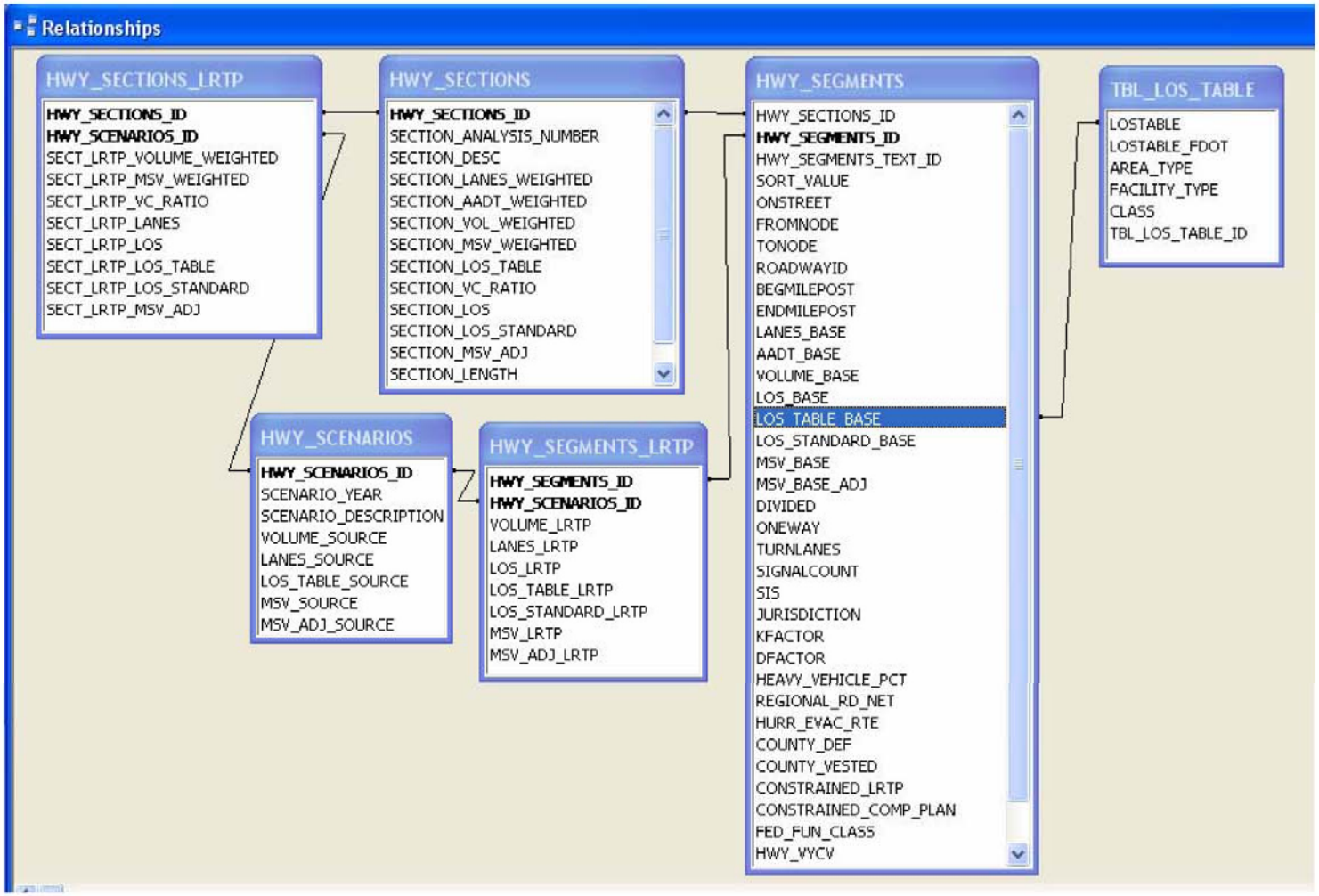
- Here you can see that our 4 example segments exist in two different scenarios.
- Notice that both sets are tagged with base or current year attributes and the scenario attributes.
- You can see the effects on LOS using base year AADT and 2009 and 2015 volumes



- The relationship of HWY_SECTIONS and HWY_SECTIONS_LRTP is shown above.

SCENARIO_DESCRIPTION	SECTION_DESC	SECTION_AADT_WEIGHTED	SECT_LRTP_VOLUME_WEIGHTED	SECTION_LOS	SECT_LRTP_LOS
Data from Table a2009 imported from alldata.mdb	4TH AVE: (CHANNELSIDE DR -to-NUCCIO PKWY)	3972	8418	C	D
Data from Table a2015 imported from alldata.mdb	4TH AVE: (CHANNELSIDE DR -to-NUCCIO PKWY)	3972	9076	C	D

- Here you can see with our example section that it exists in two different scenarios.
- Notice that both are tagged with base or current year attributes and the LRTP attributes.
- You can see the effects on LOS using base year AADT and 2009 and 2015 volumes



- The graphic above shows how the section, segment, and scenario tables fit together.

LOS Table Codes

TBL_LOS_TABLE : Table

LOSTABLE	LOSTABLE_FDOT	AREA_TYPE	FACILITY_TYPE	CLASS	TBL_LOS_TABLE_ID
UrArt1	1Art1	Urbanized	Interrupted Arterial	1	1
UrArt2	1Art2	Urbanized	Interrupted Arterial	2	2
UrArt3	1Art3	Urbanized	Interrupted Arterial	3	3
UrArt4	1Art4	Central Business District	Interrupted Arterial	4	4
UrFwy1	1Fwy1	Urbanized	Freeway	3	5
UrFwy2	1Fwy2	Urbanized	Freeway	4	6
UrHwy	1Hwy	Urbanized	Multi-Lane Un-Interrupted Arterial		7
UrSig	1Sig	Urbanized	Signal Controlled Collector		8
TrArt1	2Art1	Transitioning	Interrupted Arterial	1	9
TrArt2	2Art2	Transitioning	Interrupted Arterial	2	10
TrArt3	2Art3	Transitioning	Interrupted Arterial	3	11
TrFwy	2Fwy	Transitioning	Freeway	2	12
TrHwy	2Hwy	Transitioning	Multi-Lane Un-Interrupted Arterial		13
TrSig	2Sig	Transitioning	Signal Controlled Collector		14
RDArt	3ArtD	Rural Developed	Interrupted Arterial	1	15
RDFwy	3FwyD	Rural Developed	Freeway	1	16
RUFwy	3FwyU	Rural Undeveloped	Freeway	1	17
RDHwy	3HwyD	Rural Developed	Multi-Lane Un-Interrupted Arterial		18
RUHwy	3HwyU	Rural Undeveloped	Multi-Lane Un-Interrupted Arterial		19
RUInt	3IntU	Rural Undeveloped	Isolated Interrupted Arterial	0	20

- Each segment and section is tagged with a code that encompasses area type, facility type, and class code.
- These codes have been adopted by System Planning Office. The field, LOSTABLE_FDOT, contains the codes they are using. The leading digit indicates area type.
- In the field, LOSTABLE, "Ur" has been substituted for FDOT's 1, "Tr" for 2, and "RD" and "RU" for 3. This was done so that no lookup table was needed to interpret the code.

LOS_CALCULATOR : Table

LOS_TABL	Min_LaneCount	Max_LaneCo	Daily_A	Daily_B	Daily_C	Daily_D	Daily_E
RDArt	1	2	0	2200	11000	13900	14900
RDArt	3	4	0	5300	25500	29400	31200
RDArt	5	6	0	8400	39400	44200	46800
RDFwy	1	4	21300	35300	47900	56600	63000
RDFwy	5	6	33100	54300	73900	87400	97200
RDFwy	7	8	44700	73600	100000	118400	131400
RDHwy	1	2	2500	7200	12700	17300	23500
RDHwy	3	4	17800	28900	41800	54100	61500
RDHwy	5	6	26800	43300	62700	81200	92200
RUFwy	1	4	21300	35300	47900	56600	63000
RUFwy	5	6	33100	54300	73900	87400	97200
RUFwy	7	8	44700	73600	100000	118400	131400
RUHwy	1	2	2600	5300	8600	13800	22300
RUHwy	3	4	17500	28600	40800	52400	58300
RUHwy	5	6	26200	42800	61200	78600	87400
RUInt	1	2	0	1900	8000	10700	12100
RUInt	3	4	0	2900	17400	23000	25200
RUInt	5	6	0	4500	27100	35500	43100
TrArt1	1	2	0	4000	13100	15500	16300
TrArt1	3	4	4600	27900	32800	34200	34200
TrArt1	5	6	6900	42800	49300	51400	51400
TrArt2	1	2	0	0	10500	14500	15300
TrArt2	3	4	0	3700	24400	30600	32200
TrArt2	5	6	0	6000	38000	46100	48400
TrArt3	1	2	0	0	5000	11800	14600
TrArt3	3	4	0	0	11700	27200	30800
TrArt3	5	6	0	0	18400	42100	46300
TrFwy	1	4	23500	38700	52500	62200	69100

- These codes are incorporated into LOS_CALCULATOR, the 2002 FDOT LOS lookup table.

LOS_CALCULATOR : Table

Field Name	Data Type	
LOS_TABLE	Text	
Min_LaneCount	Number	
Max_LaneCount	Number	
Daily_A	Number	
Daily_B	Number	
Daily_C	Number	
Daily_D	Number	
Daily_E	Number	
PeakHrPeakDir_A	Number	
PeakHrPeakDir_B	Number	
PeakHrPeakDir_C	Number	
PeakHrPeakDir_D	Number	
PeakHrPeakDir_E	Number	
TwoWayPeakHour_A	Number	
TwoWayPeakHour_B	Number	
TwoWayPeakHour_C	Number	
TwoWayPeakHour_D	Number	
TwoWayPeakHour_E	Number	
MinSignalDensity	Number	
MaxSignalDensity	Number	
RoadTypeLookupCode	Text	D (Divided) or U (Undivided)

- LOS_CALCULATOR can deal with AADTs; peak hour directional volumes; and peak hour, two directional volumes.
- Traffic signal spacing/density is included for arterial classes.
- The road type (divided/undivided) is included when appropriate.
- The routines that calculate LOS will take into account if the segment is divided roads and/or has turn lanes, and adjust accordingly.

AADTs and Other Traffic Volumes

- Various agencies provide traffic counts for the MPO
- These counts, with minor exceptions, are AADTs.
- Using K, D, and seasonal factors, these AADTs can be converted to peak volumes.
- Traffic counts are collected at count stations.

Count Stations

- The MPO has assigned each count station a unique station id, COUNT_STATIONS_ID
- Each count station is maintained by a agency (FDOT, city, or county)
- Each count station has a street location and description
- Each count station has a route identifier and milepost to locate it spatially on a map and the id of the segment on which it is located.

COUNT_STATIONS : Table

Field Name	Data Type	
COUNT_STATIONS_ID	Text	Col1=agency, col2=type,col3-6=station #
HWY_SEGMENTS_ID	Number	On which Segment is this station located
AGENCY	Text	Agency providing the AADT
ROADWAYID	Text	GIS Route identifier (ie. TA4730)
MILEPOST	Number	GIS mile post.
PERMANENT	Yes/No	Yes=Permanent counter
LOCATION	Text	Street name where station is located
LOCATION_DESC	Text	Location description

COUNT_STATIONS : Table

COUNT_STATIONS_ID	HWY_SEGMENTS_ID	AGENCY	ROADWAYID	MILEPOST	PERMANENT	LOCATION	LOCATION_DESC
110001	2204	FDOT	SRB045	11.53607953	☑	NEBRASKA AVE	N OF SR 685/BUS 41/FLA
110002	1737	FDOT	SRB045	10.8590569	☑	US 41	S.OF FLORIDA AVE./NEBRASKA AVE. APE
110003	1860	FDOT	SRA599	0.669309188	☑	US 41/SR 45/50TH ST	N OF SR 676/CAUSEWAY BLVD
110004	2125	FDOT	SRC045	23.49091144	☑	US 41/SR 45/50TH ST	S OF SR 676/CAUSEWAY BLVD
110005	2247	FDOT	SRC045	8.811421256	☑	US 41	S OF 19TH AVE. SO.
110006	2245	FDOT	SRC045	7.341260322	☑	US 41	BRIDGE AT LITTLE MANATEE RIVER
110007	1789	FDOT	SRA674	6.161338927	☑	SR 674	E OF US 301
110008	2259	FDOT	SRA043	15.66427602	☑	US 301	S OF GIBSONTON DR
110010	2251	FDOT	SRA043	25.09508683	☑	US 301	S OF THE INTERCHANGE OF I-4 AND US 92

AADTS from Count Stations

COUNT_STATIONS_AADT : Table

Field Name	Data Type	
COUNT_YEAR	Number	Year when count was taken
COUNT_STATIONS_ID	Text	Count station id
COUNT_STATION_AADT	Number	AADT provided by agency
SEASON_ADJ_FACTOR	Number	FDOT seasonal factor
AXLE_ADJ_FACTOR	Number	FDOT axle factor
K_FACTOR	Number	K factor
D_FACTOR	Number	D factor
MOCF_FACTOR	Number	MOCF factor
PEAKHR_PEAKDIR	Number	Peak Hour, peak direction volume
PEAKHR_TWOWAY	Number	Peak Hour, two way volume
STUDY_DATE	Date/Time	Study date

COUNT_STATIONS_ID	COUNT_YEAR	COUNT_STATION_AADT	SEASON_ADJ_FACTOR	AXLE_ADJ_FACTOR	K_FACTOR	D_FACTOR	MOCF_FACTOR
110001	2002	8236	1	0	0.12	0.52	1
110001	2003	14964	1	0	0.12	0.52	1
110001	2004	5882	1	0	0.12	0.52	0.93
110001	2005	4760	1	0	0.12	0.52	0

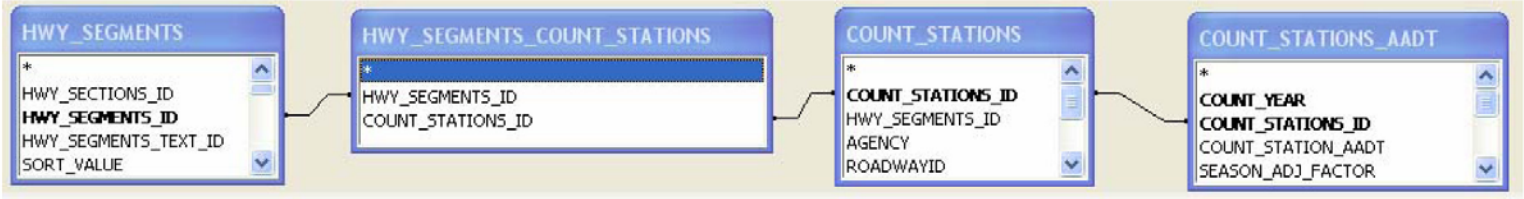
- Each count station generates a new AADT each year
- Each count station generates factors that can be used in conjunction with AADT to generate peak hour volumes.
- Shown above are the AADTs for 2002-2005 for count station 110001.

Associating count stations with segments

HWY_SEGMENTS_COUNT_STATIONS : Table

HWY_SEGMENTS_ID	COUNT_STATIONS_ID
1	321820
2	321820
3	321820
4	329330
5	110041
6	321830
7	321940
8	321930
9	321920
10	321850

- HWY_SEGMENTS_COUNT_STATIONS associates a segment with a count station
- One count station can be associated with one or more segments.
- One segment can be associated with one or more count stations.



HWY_SEGMENTS_ID	HWY_SEGMENTS_TEXT_ID	COUNT_STATIONS_ID	COUNT_YEAR	COUNT_STATION_AADT
1	TA4730:040	321820	1999	29063
1	TA4730:040	321820	2001	22650
1	TA4730:040	321820	2002	24324
1	TA4730:040	321820	2003	29677
1	TA4730:040	321820	2005	31109
2	TA4730:030	321820	1999	29063
2	TA4730:030	321820	2001	22650
2	TA4730:030	321820	2002	24324
2	TA4730:030	321820	2003	29677
2	TA4730:030	321820	2005	31109
3	TA4730:020	321820	1999	29063
3	TA4730:020	321820	2001	22650
3	TA4730:020	321820	2002	24324
3	TA4730:020	321820	2003	29677
3	TA4730:020	321820	2005	31109

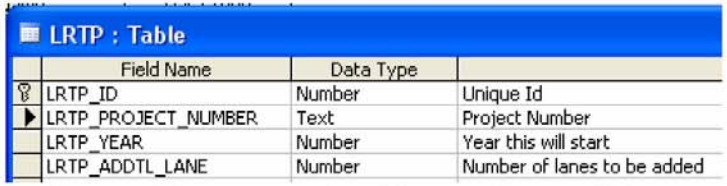
Future Traffic Volumes

HWY_VOLUMES_TREND : Table

Field Name	Data Type	
HWY_SEGMENTS_ID	Number	Link to unique segment
TREND_YR1_VOLUME	Number	Volume for Yr1 (Current year+1) based on trend/regression analysis
TREND_YR2_VOLUME	Number	Volume for Yr2 (Current year+2) based on trend/regression analysis
TREND_YR3_VOLUME	Number	
TREND_YR4_VOLUME	Number	
TREND_YR5_VOLUME	Number	
TREND_YR6_VOLUME	Number	
TREND_YR7_VOLUME	Number	
TREND_YR8_VOLUME	Number	
TREND_YR9_VOLUME	Number	
TREND_YR10_VOLUME	Number	
TREND_YR11_VOLUME	Number	
TREND_YR12_VOLUME	Number	
TREND_YR13_VOLUME	Number	
TREND_YR14_VOLUME	Number	
TREND_YR15_VOLUME	Number	
TREND_YR16_VOLUME	Number	
TREND_YR17_VOLUME	Number	
TREND_YR18_VOLUME	Number	
TREND_YR19_VOLUME	Number	
TREND_YR20_VOLUME	Number	
TREND_YR21_VOLUME	Number	
TREND_YR22_VOLUME	Number	

- Based on historical AADTs from each segment, a regression analysis can project future volumes.
- HWY_VOLUMES_TREND contains one record for each segment.
- Each record contains projected volumes based on regression analysis.

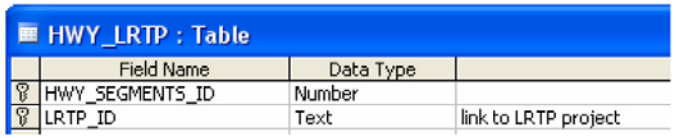
LRTP



LRTP : Table

	Field Name	Data Type	
🔑	LRTP_ID	Number	Unique Id
▶	LRTP_PROJECT_NUMBER	Text	Project Number
	LRTP_YEAR	Number	Year this will start
	LRTP_ADDTL_LANE	Number	Number of lanes to be added

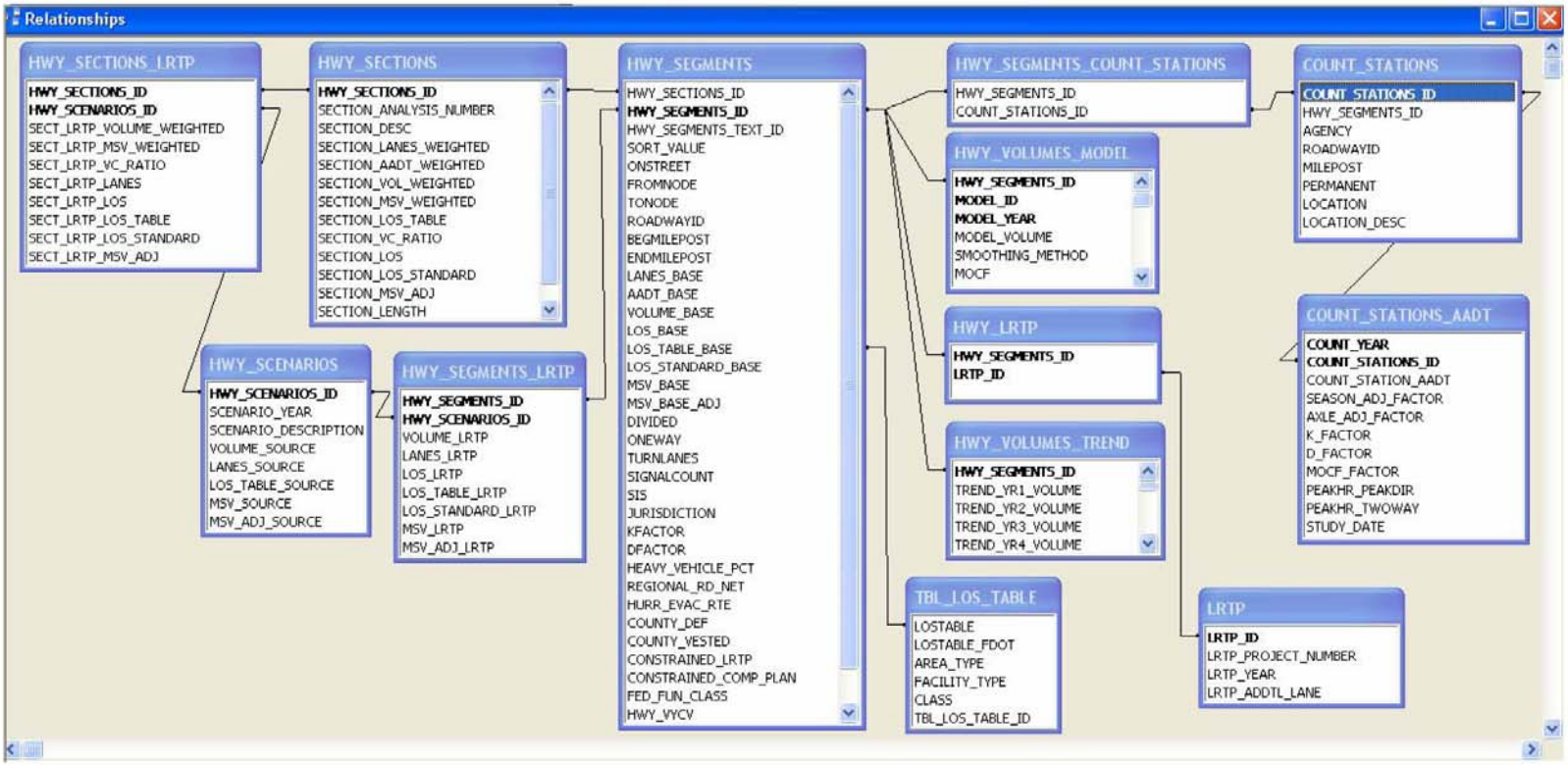
- Long Range Transportation Plan projects will be stored in LRTP



HWY_LRTP : Table

	Field Name	Data Type	
🔑	HWY_SEGMENTS_ID	Number	
🔑	LRTP_ID	Text	link to LRTP project

- LRTP projects will be tagged to the segments.
- The same segment may appear more than once in this table. If a segment will receive additional lanes in 2010 and then again in 2015, there would be two records in this table each having the same HWY_SEGMENTS_ID but different LRTP Ids.
- More than one segment may be tagged with the same LRTP project.



- The graphic above shows how all tables fit together.

How information is passed from one year to the next.

- Each base year has its own database.
- Each database has the same queries, reports, etc.
- The structure of the tables in each database is the same. The # of records and record content will vary from database to database.
- Each database records the activity and results for that year.
- If you are in the database for 2007 and you want to compare with the results of 2006, you can link to the 2006 tables in the 2006 database to the 2007 database and write comparison queries.
- Microsoft Access lets you name the links so that you do not have two tables with the same name and you can tell them apart.
- If there is a need to migrated the LOS databases to Oracle, the same table structure can be exported to Oracle. The data from an individual database can be kept separate from one another or by adding a year field to each table, data from all databases could be added to the same tables.

Why have separate databases?

- The volume of data generated in one year will grow to over 100 MG. The likelihood that Microsoft Access will begin to have troubles increases as the size of the database increases over 100 MG.
- If you have a question about a previous year, you can go to the specific database that has the data you need.
- Once the work for one year is done and you start on the next year, the data for the previous year generally becomes frozen. If you are working in 2007 and you find a problem, you would not edit the 2006 data so that you could rerun a 2006 report. You would fix it in the 2007 database, and go on. The 2006 reports have already been published.

How information is passed from one year to the next.

- Assume that the database used in 2006 was named Hills_MPO_2006.mdb
- In 2007, copy Hills_MPO_2006.mdb to Hills_MPO_2007.mdb

Hills_MPO_2007.mdb

There will be forms to guide/help the user(s) through the following tasks to update the database for 2007

- Start the LRTP scenario tables fresh or retain the LRTP scenarios from Hills_MPO_2006.mdb. The scenarios only change with the LRTP updates on a 5-year cycle
- Append current traffic volumes to the appropriate tables.
- Make changes to the attributes or definition of segments/sections.
- When the above tasks are completed, activate "Update" functions to recalculate all calculated fields in the database (i.e. LOS, the weighted averaged fields in HWY_SECTIONS, section/segment data based on scenarios, etc).
- Routines to export/import from the model would be run on an as needed basis.
- Create new scenarios or delete existing scenarios.

HWY_SECTIONS_ROADWAYS

HWY_SECTIONS_ROADWAYS : Table

HWY_SECTIONS_ID	SECTION_ROADWAY	SECTION_BMP	SECTION_EMP
2	TA4730	0.562	0.714
3	TA4730	0.714	0.76
4	TA4730	0.76	1.517
5	TA4730	1.517	1.767
6	TA4760	0	0.277
7	TA4760	0.277	0.506
8	TA4760	0.506	0.658
9	TA4760	0.658	0.81
10	TA4760	0.81	0.962
11	TA4760	0.962	1.009
12	CR2900	0	0.514
12	CR4760	0	1.51
13	TA1910	0	1.002
14	CR1910	0	1.019
15	TA1900	0	0.932
16	TA1900	0.932	1.185

- Some sections require more than one roadway, begin milepost, end milepost record to describe it.
- The highlighted records show a section that requires two records if you were to map it.

Misc

- ROW_COST, DESIGN_COST, CONST_COST, TOTAL_COST, REV_SOURCE, COST_LOOKUP{key value}) will be added later to The HWY_SEGMENTS_LRTP table
- A table for per mile unit costs would also be added. (COST_LOOKUP{key value}, CONST_UNIT, DESIGN_PERCENT, ROW_PERCENT)

B-2: HART Bus Routes

Local Routes (Effective November 18, 2007)

Route 1 Florida Avenue
Route 2 Nebraska Avenue
Route 4 Britton Plaza
Route 5 40th Street
Route 6 56th Street
Route 7 West Tampa/Citrus Park
Route 8 Progress Village/Brandon
Route 9 15th Street
Route 10 Cypress Street
Route 12 22nd Street
Route 14 Armenia Avenue
Route 15 Columbus Drive
Route 16 Waters Avenue
Route 18 30th Street
Route 19 Westshore/Manhattan
Route 30 Town 'N Country
Route 31 South Hillsborough County
Route 32 Dr. Martin Luther King, Jr. Boulevard
Route 33 Dale Mabry Highway/Fletcher Avenue
Route 34 Hillsborough Avenue
Route 36 Dale Mabry/Himes Avenue
Route 37 Grand Regency Plaza
Route 39 Busch Boulevard
Route 41 Sligh Avenue
Route 44 Habana Avenue
Route 45 Rome Avenue
Route 46 Davis Islands/West Brandon
Route 57 Temple Terrace
Route 83 University Area Connector
Route 85 South Tampa Weekend Connector
Route 87 SouthShore Connector
Route 88 Town 'N Country Connector
Route 89 South Tampa Connector
Route 96 In-Town Trolley Downtown – Purple Line
Route 97 In-Town Trolley Downtown – Green Line

Local Routes

The fields below are used for the analysis of transit in the CMP. The column(s) shaded in yellow and denoted with an asterisk (Route#/NUMBER, Route Information/OF_ROUTE)) reflects the information specifically displayed in Figure 3.3 of the CMP report.

Route #	*Route Information	Service	Week	Start	End	Sat.	Start	End	Sun.	Start	End
NUMBER	OF_ROUTE	OF_SERVICE	WEEKDAY	START_TIME	W_END_TIME	SAT	START_TI0	END_TIME	SUN	START_TI1	END_TIME0
1	Florida Ave.	Week, Sat, Sun	Y	4:10 AM	12:55 AM	Y	6:35 AM	11:28 PM	Y	6:35 AM	9:34 PM
2	Nebraska Ave.	Week, Sat, Sun	Y	4:30 AM	1:01 AM	Y	5:15 AM	12:16 AM	Y	6:35 AM	10:44 PM
4	Palma Ceia / MacDill	Week	Y	5:30 AM	8:28 PM	N			N		
5	40th St.	Week, Sat, Sun	Y	5:00 AM	10:22 PM	Y	6:35 AM	8:25 PM	Y	6:35 AM	7:25 PM
6	56th St.	Week, Sat, Sun	Y	4:30 AM	1:27 AM	Y	6:35 AM	10:08 PM	Y	6:50 AM	10:00 PM
7	West Tampa / Citrus Park	Week, Sat, Sun	Y	4:40 AM	10:15 PM	Y	6:35 AM	8:28 PM	Y	6:35 AM	8:33 PM
8	Progress Village / Brandon	Week, Sat, Sun	Y	4:15 AM	1:12 AM	Y	6:30 AM	9:45 PM	Y	6:15 AM	10:45 PM
9	15th St.	Week, Sat	Y	4:30 AM	9:00 PM	Y	6:50 AM	8:56 PM	N		
10	Cypress St.	Week	Y	5:15 AM	8:17 PM	N			N		
12	22nd St.	Week, Sat, Sun	Y	4:00 AM	1:03 AM	Y	6:35 AM	10:32 PM	Y	6:35 AM	10:31 PM
14	Armenia Ave.	Week	Y	4:15 AM	8:01 PM	N			N		
15	Columbus Dr.	Week, Sat, Sun	Y	4:35 AM	10:27 PM	Y	5:50 AM	7:58 PM	Y	6:30 AM	8:32 PM
16	Waters Ave.	Week, Sat	Y	5:15 AM	7:29 PM	Y	6:30 AM	8:24 PM	N		
18	30th St.	Week, Sat	Y	5:05 AM	10:53 PM	Y	5:55 AM	9:07 PM	N		
19	Port Tampa	Week, Sat, Sun	Y	4:10 AM	9:46 PM	Y	6:35 AM	8:36 PM	Y	6:35 AM	7:36 PM
30	Town 'N Country	Week, Sat, Sun	Y	4:35 AM	1:24 AM	Y	6:35 AM	11:13 PM	Y	6:35 AM	11:13 PM
32	Dr. Martin Luther King, Jr.	Week, Sat, Sun	Y	4:35 AM	1:01 AM	Y	7:05 AM	11:00 PM	Y	7:05 AM	11:00 PM
33	Fletcher Ave.	Week, Sat	Y	5:10 AM	8:11 PM	Y	6:30 AM	8:15 PM	N		
34	Hillsborough Ave.	Week, Sat, Sun	Y	4:30 AM	1:05 AM	Y	6:30 AM	10:23 PM	Y	6:55 AM	9:49 PM
36	Dale Mabry / Himes	Week, Sat,	Y	5:05 AM	9:17 PM	Y	6:30 AM	8:24 PM	Y	6:30 AM	7:24 PM

Route #	*Route Information	Service	Week	Start	End	Sat.	Start	End	Sun.	Start	End
NUMBER	OF_ROUTE	OF_SERVICE	WEEKDAY	START_TIME	W_END_TIME	SAT	START_TI0	END_TIME	SUN	START_TI1	END_TIME0
	Ave.	Sun									
37	Brandon / netp@rk	Week, Sat	Y	4:25 AM	8:39 PM	Y	5:40 AM	7:35 PM	N		
39	Busch Blvd.	Week, Sat, Sun	Y	4:55 AM	10:38 PM	Y	7:00 AM	10:37 PM	Y	7:00 AM	8:37 PM
41	Sligh Ave.	Week	Y	5:30 AM	7:20 PM	N			N		
44	U.A.T.C. / Habana / Westshore Plaza	Week	Y	5:00 AM	10:25 PM	N			N		
45	U.A.T.C. / Rome / Westshore Plaza	Week, Sat, Sun	Y	4:30 AM	9:55 PM	Y	6:35 AM	8:48 PM	Y	6:35 AM	8:48 PM
46	Davis Islands / West Brandon	Week	Y	6:02 AM	7:00 PM	N			N		
57	U.A.T.C. / Temple Terrace / netp@rk	Week	Y	4:30 AM	10:21 PM	N			N		
83	University Area Connector	Week, Sat, Sun	Y	4:25 AM	12:36 AM	Y	6:20 AM	10:38 PM	Y	6:50 AM	9:46 PM
85	South Tampa Weekend Connector	Sat, Sun	N			Y	6:39 AM	8:20 PM	Y	6:39 AM	8:20 PM
88	Town 'N Country Connector	Week	Y	6:00 AM	6:55 PM	N			N		
89	South Tampa Connector	Week	Y	5:00 AM	8:55 PM	N			N		
96	In-Town Trolley - Downtown	Week	Y	6:00 AM	10:00 PM	N			N		
98	In-Town Trolley - Hyde Park	Week, Sat, Sun	Y	11:30 AM	11:00 PM	Y	11:30 AM	11:00 PM	Y	12:00 PM	8:30 PM
86	Ruskin SouthShore Connector	Week	Y	6:05 AM	7:04 PM	N			N		
87	Sun City SouthShore Connector	Week	Y	6:15 AM	7:10 PM						
87	Sun City SouthShore Connector	Week	Y								
31	South Hillsborough County	Week	Y	6:05 PM	9:52 PM	N			N		
87	Sun City SouthShore Connector	Week	Y								

Express Routes

*Route	Morning	Afternoon	Evening
ROUTES	MORNINGTRI	AFTERNOONT	EVENINGTRI
Route 28X - Sefffner/Dover Express	2	-	2
Route 52LX - UATC/New Tampa/Pasco Limited Express	2 In/Out	-	2 In/Out
Route 20X - Lutz Express	2	-	2
Route 22X - Dover/Brandon Express	3	-	3
Route 23X - TempleTerrace Express	2	-	2
Route 59LX - Westchase/Town æN Country Limited Express	3 In/Out	-	2 In/Out
Route 50X - CitrusParkCarrollwood Express	2	-	2
Route 25X - South Brandon/MacDill AFB Express	4	-	4
Route 26X - Carrollwood Express	2	-	2
Route 200X - Clearwater Express	3 in/Out	-	2 In/Out
Route 27X - FishHawk/South Brandon Express	3	-	3
Route 24X - FishHawk/Riverview/MacDill AFB Express	3	-	3
Route 51X - NewTampa/Pasco Express	2	-	2
Route 47LX - SouthShore Limited Express	2 In	1 in/Out	2 Out
Route 35LX - Brandon/SouthShore Limited Express	2 in/Out	2 in/Out	2 in/Out

Tampa Streetcar (Existing)

Length			Vehicle Type		Existing Y/N?
LENGTH	ACRAILRD_	ACRAILRD_I	DATA	Z025_CA_LR	Existing
32896.23007	781	781	Tampa Street Car	4	N
32896.23007	781	781	Tampa Street Car	4	N
32896.23007	781	781	Tampa Street Car	4	N
32896.23007	781	781	Tampa Street Car	4	Y
32896.23007	781	781	Tampa Street Car	4	Y
32896.23007	781	781	Tampa Street Car	4	N
0.00000	781	781		4	Y
0.00000	781	781		4	Y
0.00000	781	781		4	Y

Strawberry Connection, Plant City

*Route	Name
073	STRAWBERRY CONNECTION
073	STRAWBERRY CONNECTION
072	STRAWBERRY CONNECTION
072	STRAWBERRY CONNECTION
071	STRAWBERRY CONNECTION
071	STRAWBERRY CONNECTION
070	STRAWBERRY CONNECTION
070	STRAWBERRY CONNECTION

B-3: Bicycle and Pedestrian Facilities

On-Road Bicycle Facilities

The fields below are used for the analysis of on-road bicycle facilities in the CMP. The columns in the table are displayed from left to right, and include a sample segment of an on-road bicycle facility. The column shaded in yellow and denoted with an asterisk (Bike Lane/Y/N, BIKELANE) reflects the information specifically displayed in Figure 3.4 of the CMP report.

	Facility Length (ft)	Facility Length (mi)	Existing Y/N?	Limited Access			Roadway Name	From	To
ID	LEN_FEET	LEN_MILES	EXISTING	LMT_ACC	SORT	SORT_ALPH	ON_ST	FROM_	TO
10310	3949.43	0.75	Y	N	422	511	COUNTY LINE RD	US HWY 41	PASCO COUNTY

	Lane Left-Side	Lane Right-Side	*Bike Lane Y/N?	2025 LRTP					Bike LOS					
ID_BK	BIKE_LNL	BIKE_LNR	BIKELANE	BK_2025	BIKETYPE	MRKBKLN	BK15	BK25	BKLOS	WT	WL	OSP	BKEXORG	BIKE_COMME
10310	N	N	N	--		0	0	0	D	9	0	0	N	

				Gov. Entity						
WIDE_CURB	Z_RT	TYPE_BK	JURIS_2	MV_LOS	VOL	MV_PSTD_	Z5NAMP	BKLOSNLA	Z4BKEXS_	
0	2	U	CR	A	2769	D		D		

B-3: Bicycle and Pedestrian Facilities

Off-Road Trail Facilities

The fields below are used for the analysis of off-road trail facilities in the CMP. The cell columns of the table are displayed from left to right, and include a sample segment of an existing off-road trail facility. The column shaded in yellow and denoted with an asterisk (Trail Status/TRAIL_STAT) reflects the information specifically displayed in Figure 3.5 of the CMP report.

Trail Facility				*Trail Status	Existing Facility ?	Trail ID #	Trail Length (ft)	Trail Length (mi)
TAG	TAG_2	TRAIL_NAME	CA	TRAIL_STAT	EXISTING	TRAIL_ID	LENGTH	LEN_MILES
TRAIL	TRAIL	Upper Tampa Bay Trail Phase II	10	EXISTING	0	81	0.000	0.000

B-3: Bicycle and Pedestrian Facilities

Sidewalk Facilities

The fields below are used for the analysis of sidewalk facilities in the CMP. The cell columns of the table are displayed from left to right, and include a sample segment of an existing sidewalk facility. The column shaded in yellow and denoted with an asterisk (Total Sidewalk/MAXSW) reflects the information specifically displayed in Figure 3.6 of the CMP report. Roadways with a total sidewalk percentage between 5 % and 100% are displayed in the existing sidewalk facilities map.

Facility Length (ft)		Existing Y/N?	Street Location	From	To	Limited Access Y/N?		Facility Length (mi)
LENGTH	ID	EXISTING	ON_ST	FROM_	TO	LMTACCESS	ROAD_LAB	LEN_MI
0.000	92000	N	21ST STREET	SR 674	19TH AVE NE			0.00

			Sidewalk Left Side	Sidewalk Right Side	*Total Sidewalk	Percentage Sidewalk Need	
SORT	SORT_ALPH	ID_SW	SWL	SWR	MAXSW	SWNEED	TRK
126	49	92000	0	0	0	100	1

						Sidewalk Width (1)	Sidewalk Width (2)
WT	WL	OSP1	OSP2	PC	PCL	SWW1	SWW2
12.0	0.0	0.0	0.0	4.0	0.0	5.0	5

Buffer Space	Buffer Space	Tree % Covered	Tree % Covered				Sidewalk Need	
BUFF1	BUFF2	TREE1	TREE2	SWL03	SWR03	MAXSW03	SWNEED03	swneed032
2.0	2	0.0	0	0	0	0	100	0

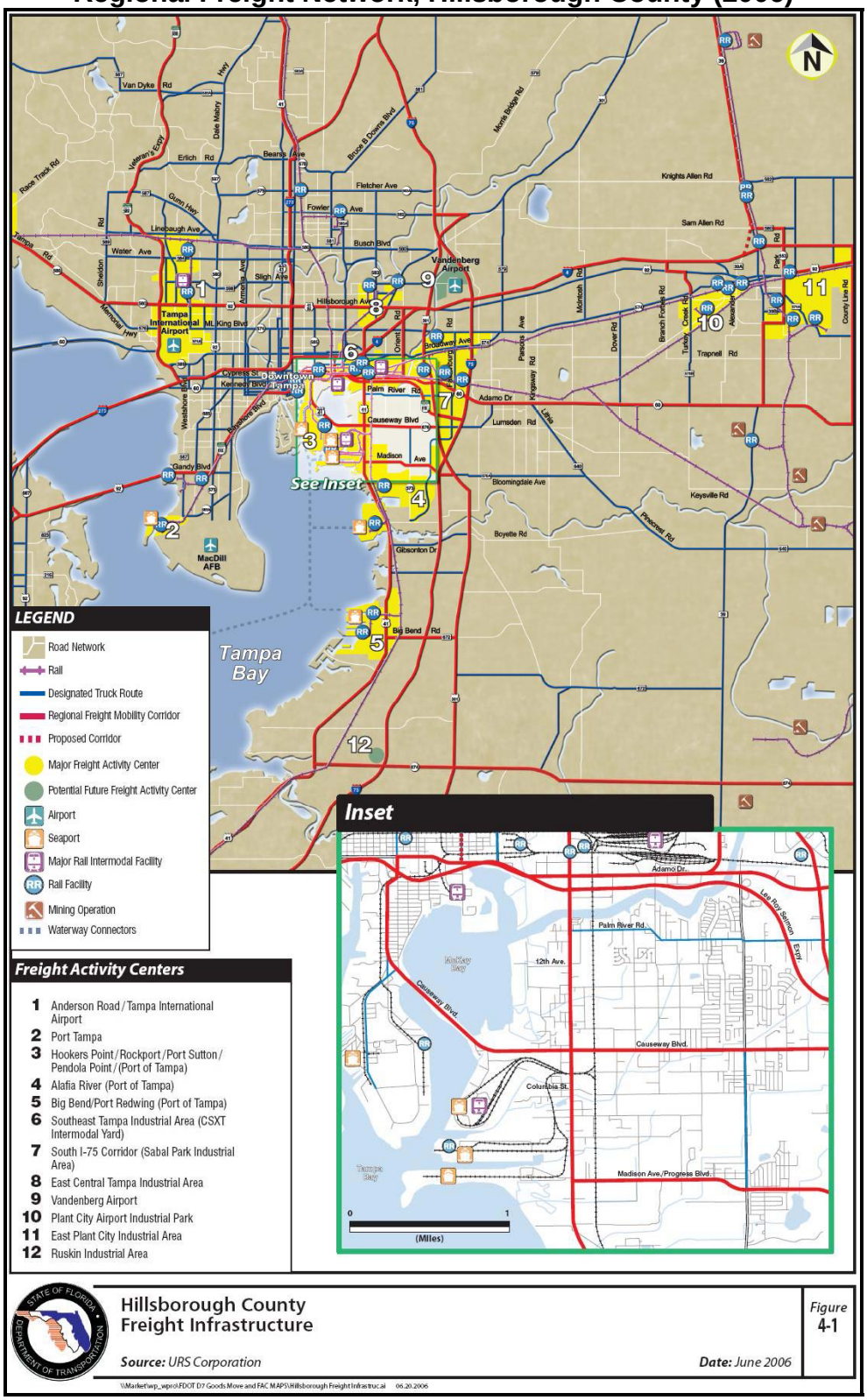
B-4: Regional Freight and Hot Spots

Hillsborough County Truck Routes

The fields below are used for the analysis of Hillsborough County truck route facilities in the CMP, and includes sample route segments. The column shaded in yellow and denoted with an asterisk (ID/OBJECTID) reflects the information specifically displayed in Figure 3.7 of the CMP report.

*ID	Facility Change	Year of Change	State or Local Route	Route Length (ft)
OBJECTID	Change	YearOfChan	TAG	Shape_Leng
1	Current		county_truck_route	6028.62437251000
2	Current		state_truck_route	10710.46033340000
3	Current		state_truck_route	17208.98756210000
4	Current		state_truck_route	6825.86238511000
5	Current		state_truck_route	1554.85593557000
6	Current		state_truck_route	8658.96774281000

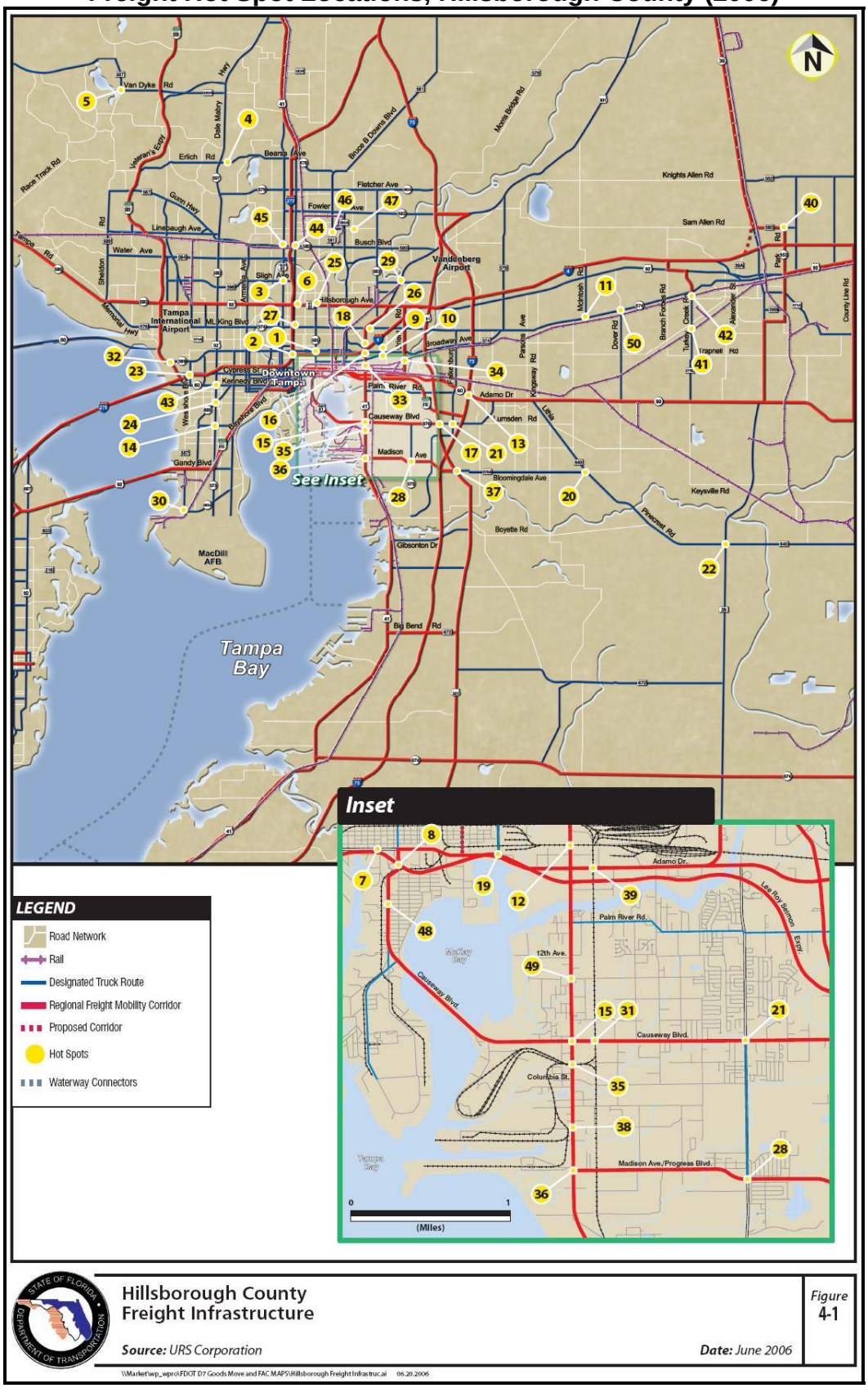
Regional Freight Network, Hillsborough County (2006)

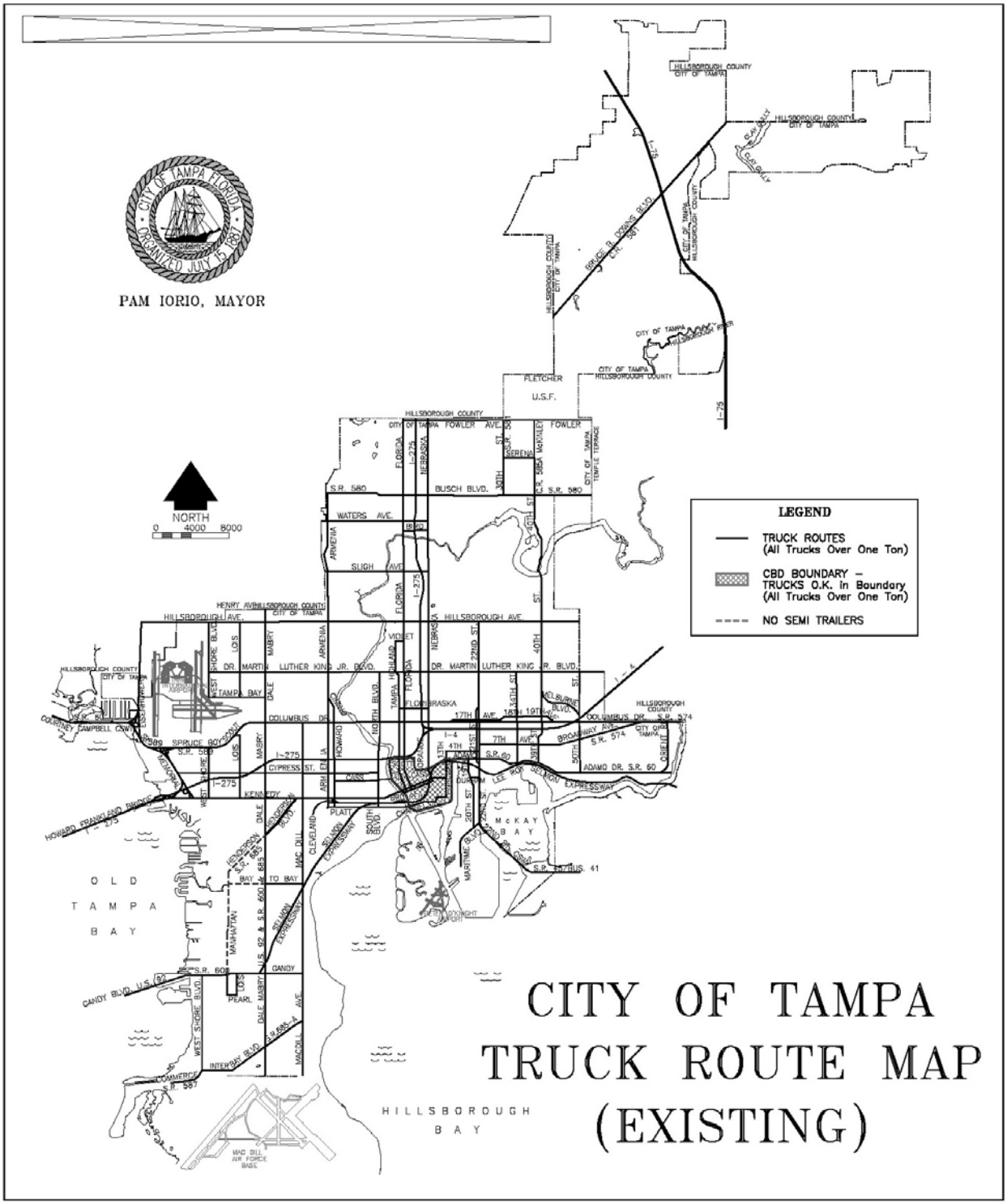


Freight Hot Spot Locations
Hillsborough County (2006)

1	22nd Street @ On-Ramp to Westbound I-4
2	I-4 @ I-275
3	Sligh Avenue @ Florida Avenue (Business 41)
4	Zambito Road @ Bearss Avenue
5	Van Dyke Road @ Gunn Highway
6	Hillsborough Avenue @ Nebraska Avenue (US 41)
7	SR 60 (Adamo Drive) @ 19th Street
8	22nd Street @ Crosstown Expressway
9	62nd Street @ Columbus Drive
10	62nd Street @ Broadway Avenue
11	SR 574 @ McIntosh Road
12	Railroad Crossing @ 50th Street (US 41) North of Adamo Drive
13	SR 60 (Adamo Drive) @ I-75
14	Dale Mabry Highway @ Bay to Bay Boulevard
15	US 41 (SR 50) @ Causeway Boulevard
16	Broadway Avenue @ 50th Street (US 41)
17	US 301 @ Causeway Boulevard
18	50th Street (US 41) @ Melbourne Boulevard
19	SR 60 (Adamo Drive) @ 34th Street
20	Bloomingdale Avenue @ Lithia-Pinecrest Road
21	Causeway Boulevard @ 78th Street
22	CR 39 @ Lithia-Pinecrest Road
23	Cypress Street @ Westshore Boulevard
24	Dale Mabry Highway @ Henderson Boulevard
25	Hillsborough Avenue @ 22nd Street
26	Dr. Martin Luther King, Jr. Boulevard @ 50th Street (US 41)
27	Dr. Martin Luther King, Jr. Boulevard @ Nebraska Avenue
28	Progress Boulevard @ 78th Street
29	Sligh Avenue @ Harney Road
30	Interbay Boulevard @ Westshore Boulevard
31	Railroad Crossing @ Causeway Boulevard East of US 41
32	Memorial Highway @ Spruce Street
33	50th Street @ Columbus Drive
34	Railroad Crossing @ Orient Road South of Broadway Avenue
35	Railroad Crossing @ US 41 South of Causeway Boulevard
36	US 41 @ Pendola Point Road
37	Progress Boulevard/Bloomingdale Avenue @ US 301
38	US 41 @ Port Sutton Road
39	Railroad Crossing @ SR 60 East of US 41
40	Sam Allen Road @ Park Road
41	Turkey Creek Road @ Sydney Road
42	Turkey Creek Road @ Airport Road
43	Dale Mabry Highway @ Kennedy Boulevard
44	Busch Boulevard @ Florida Avenue
45	Busch Boulevard @ Nebraska Avenue
46	Bougainvillea Avenue @ North 30th Street
47	Bougainvillea Avenue @ McKinley Drive
48	20th Street @ Grant Street
49	50th Street (US 41) @ 16th Street
50	SR 574 @ Dover Road

Freight Hot Spot Locations, Hillsborough County (2006)




PAM IORIO, MAYOR
NORTH
0 4000 8000
LEGEND
TRUCK ROUTES
(All Trucks Over One Ton)
CBD BOUNDARY –
TRUCKS O.K. In Boundary
(All Trucks Over One Ton)
NO SEMI TRAILERS
CITY OF TAMPA
TRUCK ROUTE MAP
(EXISTING)
OLD TAMPA BAY
HILLSBOROUGH BAY
McKAY BAY
HILLSBOROUGH COUNTY
CITY OF TAMPA
FLETCHER
U.S.F.
I-275
I-4
I-75
BUSCH BLVD.
WATERS AVE.
SLIGH AVE.
HILLSBOROUGH AVE.
HENRY AVE.
DR. MARTIN LUTHER KING JR. BLVD.
COLUMBUS DR.
CYPRESS ST.
KENNEDY
PLATT
SPRUCE ST.
TAMPA BAY
ADAMO DR. S.R. 60
CANDY
PEARL
INTERBAY BLVD.
COMMERCE
MAC DILL AIR FORCE BASE

APPENDIX C

C-1: ITS Master Plan Summary

C-1: ITS Master Plan

The ITS Master Plan inventories existing and planned deployments, and provides an evaluation framework. ITS Steering Committee members used the following weighted criteria to evaluate future projects for funding (Table C-1).

Factors related to system efficiency and capacity received the highest weight, followed closely by safety, traveler information, and promoting alternative modes. Consequently the ITS Master Plan (and through it to the regional and national ITS architecture) is closely congruent with and supports the CMP.

A number of ITS strategies or “market packages” designed to improve efficiency, effective capacity, crash reduction, incident management and transportation demand management have been implemented Hillsborough County. Table C-2 shows the existing market packages operating today.

The Master Plan shows ITS deployments in place or operating in locations throughout Hillsborough County (Table C-3).

In addition, ITS Projects are planned and in some cases underway. Table C-4 shows the planned market packages, and Table C-5 shows the locations for proposed ITS projects.

Maps C-1, C-2, and C-3 depict the existing and planned ITS deployment in Hillsborough County.

Table C-1: ITS Evaluation Criteria

Criteria	Maximum Points
Increase Efficiency and Capacity of the Transportation System - Increase the freeway and arterial throughput or effective capacity - Minimize response time to incidents - Reduce disruptions due to incidents - Improve traffic diversion capability for special events/hurricane/flood evacuation, incidents	**16**
Conform to ITS plans - Project identified in ITS Master Plan - Project consistent with Regional Architecture	**15**
Improve Safety of the Transportation Facilities - Likely to reduce the overall crash rate - Likely to reduce the rate of pedestrian and bicycle related crashes	**14**
Improve Traveler Information Dissemination to the Traveling Public - Enhance data gathering capabilities - Increase data collection locations - Provide for real-time access to pre-trip and en-route information	**12**
Promote Use of Transit/Intermodal Systems - Improve reliability of transit services - Enhance route connectivity between transit routes and transit modes - Improve safety and security of passengers and drivers - Promote efficient and compatible truck movements	**12**
Reduce Negative Impacts on Environment - Reduce harmful emissions such as hydrocarbons and carbon monoxide - Reduce fuel consumption	**12**
Enhance Homeland Security - Deter from criminal/terrorist activates - Improve evacuation coordination and emergency management	**10**
Foster and Facilitate Inter-Agency Cooperation and Information Sharing - Inter-operability between existing and planned project - Logical and complimentary extension of existing and planned deployments - Share information with other agencies	**9**

Table C-2: ITS Existing Market Packages

Market Package Existing / Stakeholder	Network Surveillance	Surface Street Control	Freeway Control	Traffic Information Dissemination	Electronic Toll Collection	Standard Railroad Grade Crossing	Transit Fixed Route Operations	Demand Response Transit Operations	Emergency Routing	Dynamic Ridesharing	Emission Monitoring and Management
FDOT D7 Regional Transportation Management Center	x	x	x	x		x					
FDOT D7Arterial Field Equipment	x	x		x		x					
FDOT D7 Freeway Field Equipment	x	x	x	x							
FDOT Turnpike District Roadway	x		x	x	x						
Hillsborough County Traffic Signal Control System	x	x	x	x		x					
Plant City Traffic Signal Control System	x	x	x	x		x					
Tampa Traffic Signal Conrtol Systems	x	x	x	x		x					
Tampa Video Surveillance	x										
Tampa Hillsborough Expressway Authority					x						
Hillsborough County SR 60 Video Surveillance						x					
HARTline Transit Management Center							x				
HARTline Transit Vehicles							x				
County Paratransit Systems								x			
County Paratransit Vehicles								x			
PSTA Paratransit Operations								x			
Emergency Medical Service Dispatch									x		
Hillsborough County Fire/Rescue Dispatch									x		
Hillsborough County Fire/ Rescue Vehicles Systems									x		
Hillsborough County Sheriff Dispatch									x		
Hillsborough County Sheriff Vehicle Systems									x		
Tampa Police Dispatch									x		
Tampa Police Vehicle Systems									x		
Tampa Fire/ Rescue Dispatch									x		
Tampa Fire/ Rescue Vehicles System									x		
Tow Dispatch									x		
Tow Vehicles Systems									x		
Florida Highway Patrol									x		
City of Temple Terrace Fire Department									x		
City of Temple Terrace Police Department									x		
Plant City Fire Department									x		
Plant City Police Department									x		
Tampa Port Authority	x										
Tampa International Airport				x							
School District of Hillsborough County					x						
Bay Area Commuter Services										x	
Environmental Protection Commission											x

Table C-3: Agency Existing ITS Project Locations

Jurisdiction	Project Location	Type of Work
Tampa Hillsborough Expressway Authority	I-4 Connector and Lee Roy Selmon Expressway	Sunpass Electronic Toll Collection.
Tampa Port Authority	Port of Tampa	Cameras, Scanners, Radio Communication systems
Tampa International Authority	Tampa International Airport	Traveler Update Information through Radio Communication Systems
Florida Department of Transportation District Seven	Countywide	Underground communication/camera system, cameras, Freeway Management, Incident Management Diversion Plans, Arterial Management System
City of Temple Terrace	Temple Terrace	White Enforcement Lights installed at select locations. Smart Trailer is used to collect speed and traffic information.
Hillsborough County Sheriffs Office	Countywide	County uses Versadex for emergency dispatch. Recently installed White Enforcement Lights at select intersections for red light enforcement.
Hillsborough County Fire Rescue	Countywide	Closed circuit television at station #9 (Hazardous Material) and radio communications system
Hillsborough County Division of Traffic Services	Countywide	Fiber optic cable layout along with 29 CCTV cameras are deployed at locations throughout County
Hillsborough County Emergency Management	Countywide	Uses radio station 89.7 for public information dissemination.
School District of Hillsborough County	Crosstown and Veterans Expressways	School buses equipped with Transponder device (Sunpass) for travel on Crosstown and Veterans Expressways. Video cameras on buses. Vehicle Maintenance Tracking System used is Fleet Pro; software is Educational Logistics.
City of Tampa Transportation Division	City of Tampa	Existing fiber optic layout, 18 cameras are installed at various locations. MTCS software is used for traffic signal locations. Traffic controllers are ATMS compatible. Approximately 8 portable message boards available.
City of Tampa Fire Rescue Department.	City of Tampa	EMS-Clausan System is in place. The Department vehicles are AVL equipped and tracked by the City's Communication Center.
Bay Area Commuter Services (BACS)	District Seven	Commuter assistance database.
HARTline	Countywide	Some buses and HARTline paratransit vans have AVL capability. Streetcars running between Ybor City and Channelside have GPS capability
Florida Highway Patrol	Countywide	Vehicles equipped with mobile computing technology.
Plant City Traffic Engineering Department	Plant City	Red light running enforcement with white Enforcement Light technology at ten locations.
Plant City Fire Department	Plant City	Vehicles use Sunpass on Crosstown Expressway.
Environment Protection Commission	Countywide	Remote air quality sensing.

Table C-4: ITS Planned Market Packages

Stakeholder \ Market Package Planned	Regional Traffic Control	Incident Management System	Parking Facility Management	Reversible Lane Management	Regional Parking Management	Transit Vehicle Tracking	Transit Passenger and Fare Management	Transit Security	Multi-modal Coordination	Transit Traveler Information	Broadcast Traveler Information	Interactive Traveler Information	ITS Data Mart	ITS Data Warehouse	ITS Virtual Data Warehouse	Emergency Response/Routing	Mayday Support
FDOT D7 Regional Transportation Management Center	X	X										X	X	X	X		
FDOT District 7 Construction/ Maintenance												X	X		X		
District 7 Static and Planned Traveler Info. System										X	X	X	X				
Hillsborough County Emergency Management		X										X	X		X		
Hillsborough County 911 Dispatch		X									X				X		
Hillsborough County Fire/Rescue Dispatch		X													X		
Hillsborough County Sheriff Dispatch		X													X		
Hillsborough County Traffic Control Center	X	X									X	X	X		X		
School District of Hillsborough County						X		X			X						
Hillsborough County MPO/ Planning System												X	X	X			
County Warning Points		X										X	X		X		
County Paratransit Vehicles						X	X	X		X							
County Paratransit Systems						X	X	X		X							
Hillsborough County Fire/ Rescue Vehicle Systems															X		
Hillsborough County Sheriff Vehicle Systems															X		
I-4 Corridor Traffic Control Center	X	X													X		
Plant City Traffic Control Center	X	X										X	X		X		
Tampa Traffic Control Center	X	X		X								X	X		X		
Florida Highway Patrol Dispatch		X										X	X		X		
Metro Traffic Traffic Information Radio		X							X	X	X	X	X				
Tampa Fire/ Rescue Dispatch		X													X		
Tampa Fire/ Rescue Vehicle Systems															X		
Tampa Bay Crisis Center																	X
Tampa International Airport									X				X	X			
Tampa Hillsborough Expressway Authority	X	X		X													
Tampa Police Vehicle Systems															X		
Tampa Police Dispatch		X													X		
Plant City Fire		X													X		
Plant City Police		X													X		
Temple Terrace Fire		X													X		
Temple Terrace Traffic Signal System																	
Temple Terrace Police		X													X		
CBD Parking Systems			X		X												
Special Event Parking Systems			X		X												
HARTline Transit Management Center		X				X		X	X	X			X	X			
HARTline Bus Service						X			X	X							
HARTline Website									X	X	X	X					
HARTline Transit Vehicles		X				X		X	X								
Transit Kiosks								X	X	X							X
Amtrak Train Terminal/ Bus Service									X				X	X			
USF Bull Runner System/Parking/Traffic									X	X							
Bay Area Commuter Services									X	X	X	X		X			
Private Traveler Information Providers											X	X					
Route Guidance Information System											X	X					
Traveler PC/ Info. Appliance											X	X					
Traveler Vehicle											X	X					X
Rest Areas													X				
Air Freight Terminals													X	X			
Marine Terminals													X	X			
National Weather Service													X	X			
Rail Intermodal Terminals													X	X			
Emergency Medical Service Dispatch																X	
Tow Dispatch/ Vehicle Systems																X	
Environmental Protection Commission													X				
Sunshine Skyway Motorist Service/ Crisis Hotline																	X

Table C-5: Agency Proposed ITS Projects

Jurisdiction	Project Location	Type of Work	Time Frame
FDOT-D7	I-275 (SR 93) from Bears Ave to I-75	ITS Communication System (Fiber Optic Cable, Modem Installations)	Construction begins in 2008
FDOT-D7	I-75 (SR 93A) from US 301 to I-275	ITS Communication System (Fiber Optic Cable, Modem Installations)	Construction begins by 2006
FDOT-Turnpike	Sunpass Challenge Anderson Rd. Dual Dedicated	ITS Communication System (Fiber Optic Cable, Modem Installations)	Construction begins later than 2008
FDOT-Turnpike	Sunpass Challenge Veterans/Suncoast-Anderson, Sugarwood	ITS Communication System (Fiber Optic Cable, Modem Installations)	Construction begins by 2004
FDOT-Turnpike	Sunpass Challenge Veterans/Suncoast-Hills Ave, Wilsky, Gunn Hwy	ITS Communication System (Fiber Optic Cable, Modem Installations)	Construction begins by 2007
FDOT-D7	I-275 (SR 93) from Bearss Ave to I-75	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2008
FDOT-D7	I-275 (SR 93) from east of Howard Frankland to Kennedy Blvd	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2005
FDOT-D7	I-275 (SR 93) from MLK Blvd to Bearss Ave.	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2005
FDOT-D7 FDOT-D7	I-275 (SR 93) from Hillsborough River to Downtown Interchange. Links Stage I – SR 60 from Cypress St. to north of Courtney Campbell Cause Links Stage II and III – I-275 (SR 93) from Howard Frankland Bridge to Hillsborough River	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations) ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2004 Stage I: Construction begins by 2004 Stage II: Construction begins by 2006 Stage III: Construction begins by 2009
FDOT-D7	I-4 (SR 400) from W of 14th Street to E of 50th	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2005
FDOT-D7	I-4 (SR 400) from 50th Street to CR 579	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2006
FDOT-D7	I-4 (SR 400) from CR 579 to Park Road	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2006
FDOT-D7	I-4 (SR 400) from Park Road to Polk County Line	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2005
FDOT-D7	I-4 (SR 400) from Polk County Line to US 27	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2006
FDOT-D7	I-75 (SR 93) from Manatee County to US 301	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2015
FDOT-D7	I-75 (SR 93A) from US 301 to Fowler Ave.	ITS Freeway Management System (no incident detection, video monitoring of interchanges)	Construction begins by 2005

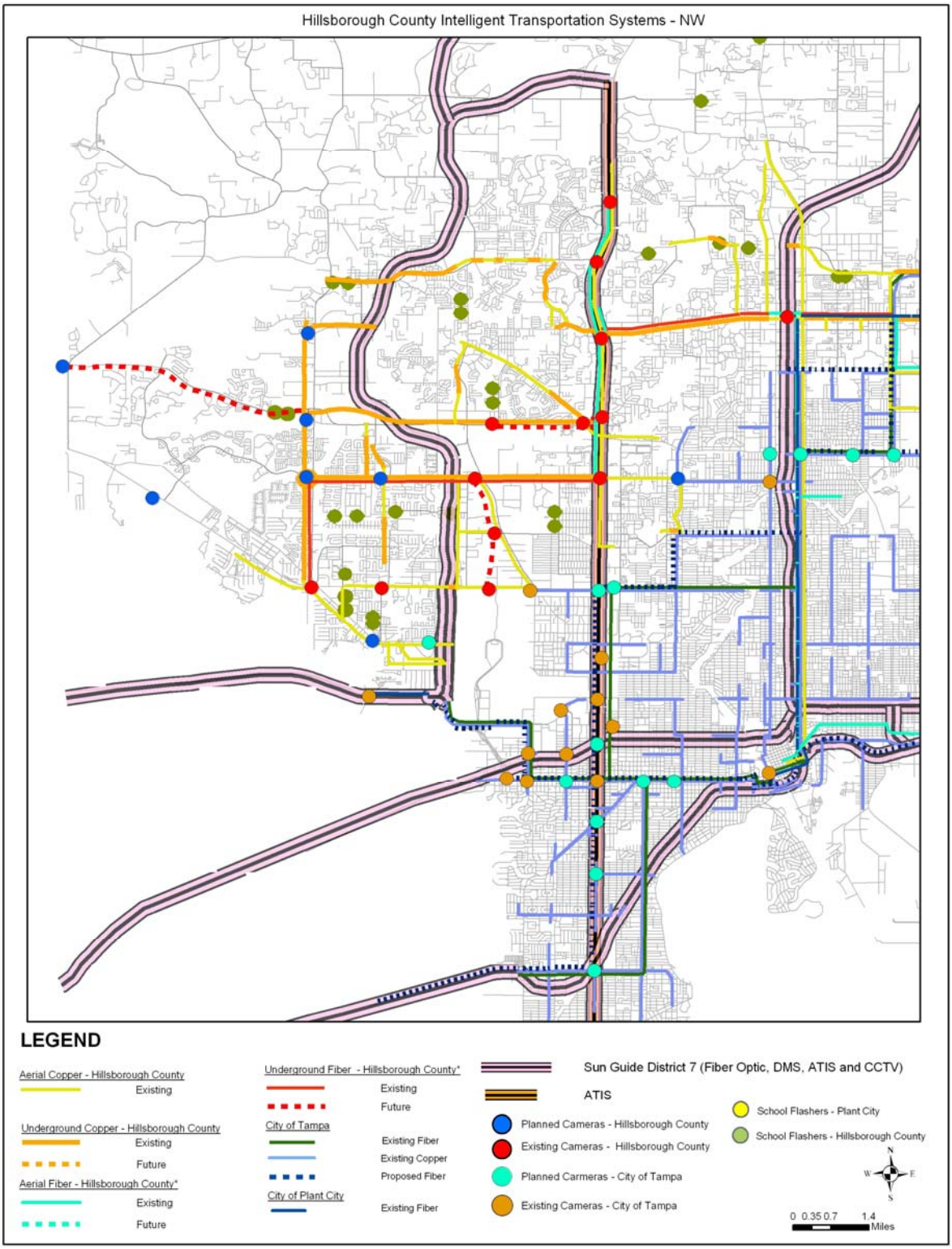
Table C-5: Agency Proposed ITS Projects (continued)

Jurisdiction	Project Location	Type of Work	Time Frame
FDOT-D7	Tampa Bay Sunguide Traffic Management. Center Bldg.	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2004
FDOT-D7	I-75 from Hillsborough County Line to Fowler Avenue	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2010
FDOT-D7	On I-75 from N of SR 54 to Northern District Boundaries	Freeway Management System (but no incident detection devices installed)	Construction begins by 2008
FDOT-D7	Courtney Campbell from Bayside Bridge to Veterans Expressway	Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2006
FDOT-D7	Gandy Boulevard from I-275 to Lee Roy Selmon Expressway	Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2008
Hillsborough County Expressway Authority	Lee Roy Selmon Crosstown Expressway	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction underway
FDOT-D7 and FDOT-D1	Hillsborough County Line to West US RT 27	ITS Freeway Management System (Communication fiber optic cable, DMS, CCTV cameras and vehicle detection stations)	Construction begins by 2007
HARTline	HARTline. Bus ITS Project	Advanced Traveler Information System	Construction begins by 2004
FDOT Central Office	I-4 Corridor	ITS Applications for I-4 Corridor Congestion	Implementation by 2010
Tampa International Authority	Tampa International Airport	Dynamic Message Signs will be used for efficient parking, passenger, vehicle inspection, security, traffic information updates	Install in June 2004.
Tampa Port Authority	Port of Tampa	Security Upgrade to include automation of security checks. Dynamic Message Signs on SR 60 and Channelside Drive	Seeking funding Funded
City of Temple Terrace Fire Department	Temple Terrace	Use of AVL/Computers on the Fire Department vehicles	Seeking funding
Hillsborough County Sheriffs Office	Countywide	AVL, GPS to install in their vehicles.	Deployed by 2005
Hillsborough County Fire Rescue	Countywide	To install AVL in the fire engines. Strategic response locations include SR 60, Dale Mabry, Fletcher Ave. and Fowler Ave.	Deployed by 2004
Hillsborough County Division of Traffic Services	Countywide	Fiber optic cables, ATMS, including video detection, DMS, and incident detection. Specific projects: 1. Video detection along Race Track Road and Boyette Road 2. DMS improvement at Waters Avenue and Anderson Road in cooperation with CSX Railroad. 3. Fiber optic layout along Linebaugh Ave. from Race Track Road to Sheldon Road.	2004 - 2008
School District of Hillsborough County	Countywide	Automated Routing System (ARS) for route optimization.	ARS will be deployed by 2004

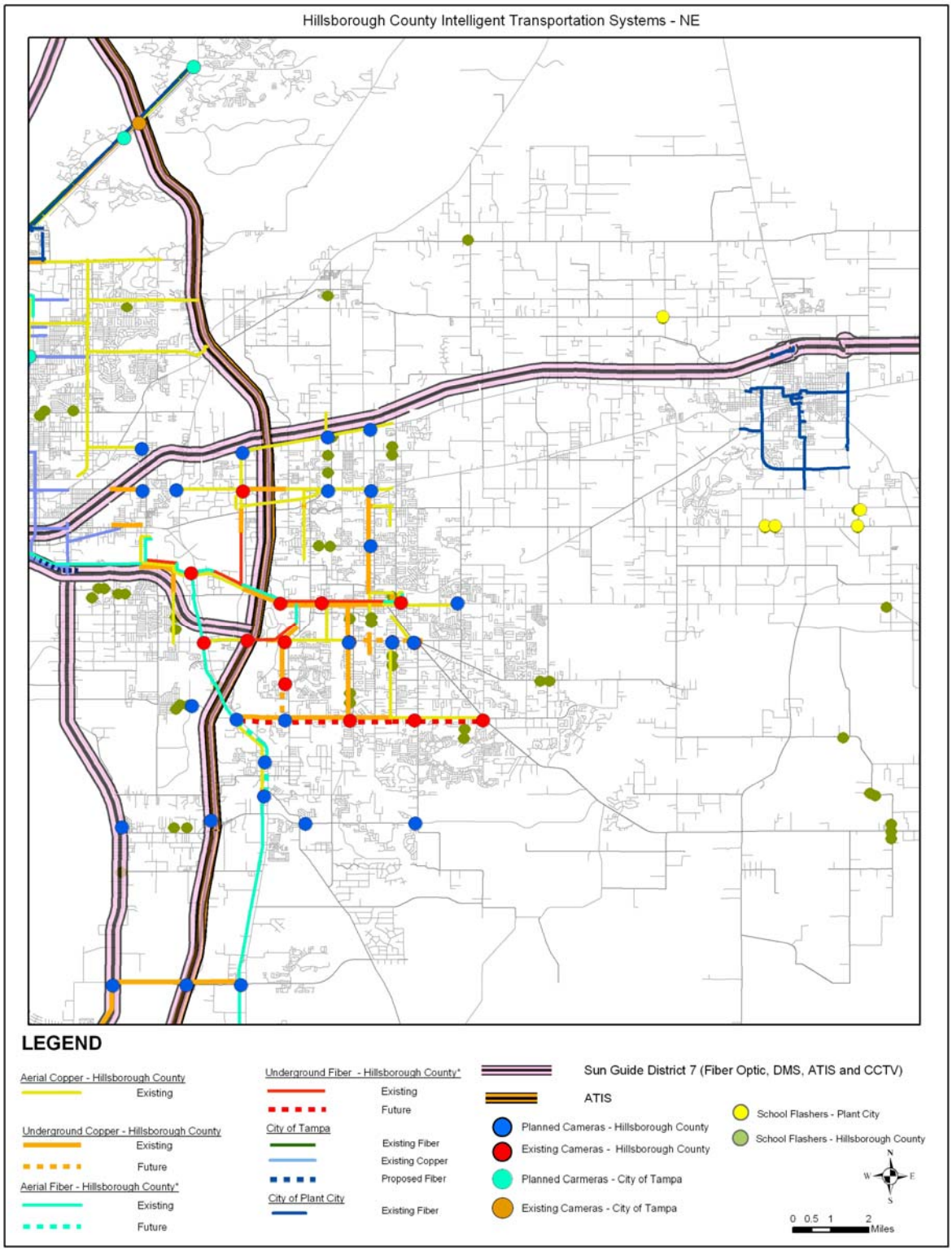
Table C-5: Agency Proposed ITS Projects (continued)

Jurisdiction	Project Location	Type of Work	Time Frame
Hillsborough County Emergency Management	Along major arterials	Coordinate with the Hillsborough County Traffic Engineering Division regarding installation of Fiber Optic Cables, CCTV's, and DMS for arterial roadways.	Implementation by 2010
City of Tampa Transportation Division	City of Tampa	15 ATMS compatible traffic control devices /system traffic surveillance cameras at 15 locations. Fiber installation will be shared with Hillsborough County.	Construction begins by 2004
Bay Area Commuter Services	Countywide	BACS supports DMS and would like to see a regional "Smart Card" system for commuters.	Current
HARTline	Countywide	Installation of GPS on buses to include "Smart Bus" tracking feature.	Implementing by 2008
Florida Highway Patrol	Countywide	GPS equipped vehicles planned.	2004
Plant City Traffic Engineering Department	Plant City	Fiber technology will be used for possible new Traffic Management Center.	Unfunded
Environment Protection Commission	City of Tampa	Fiber optic cable technology will be used to connect Downtown Tampa to receive/send data for air monitoring.	Unfunded
CUTR-University of South Florida	City of Tampa	Development of an ITS Integration and Test Facility. There is a potential for the development of new technological ideas within this facility.	Unfunded

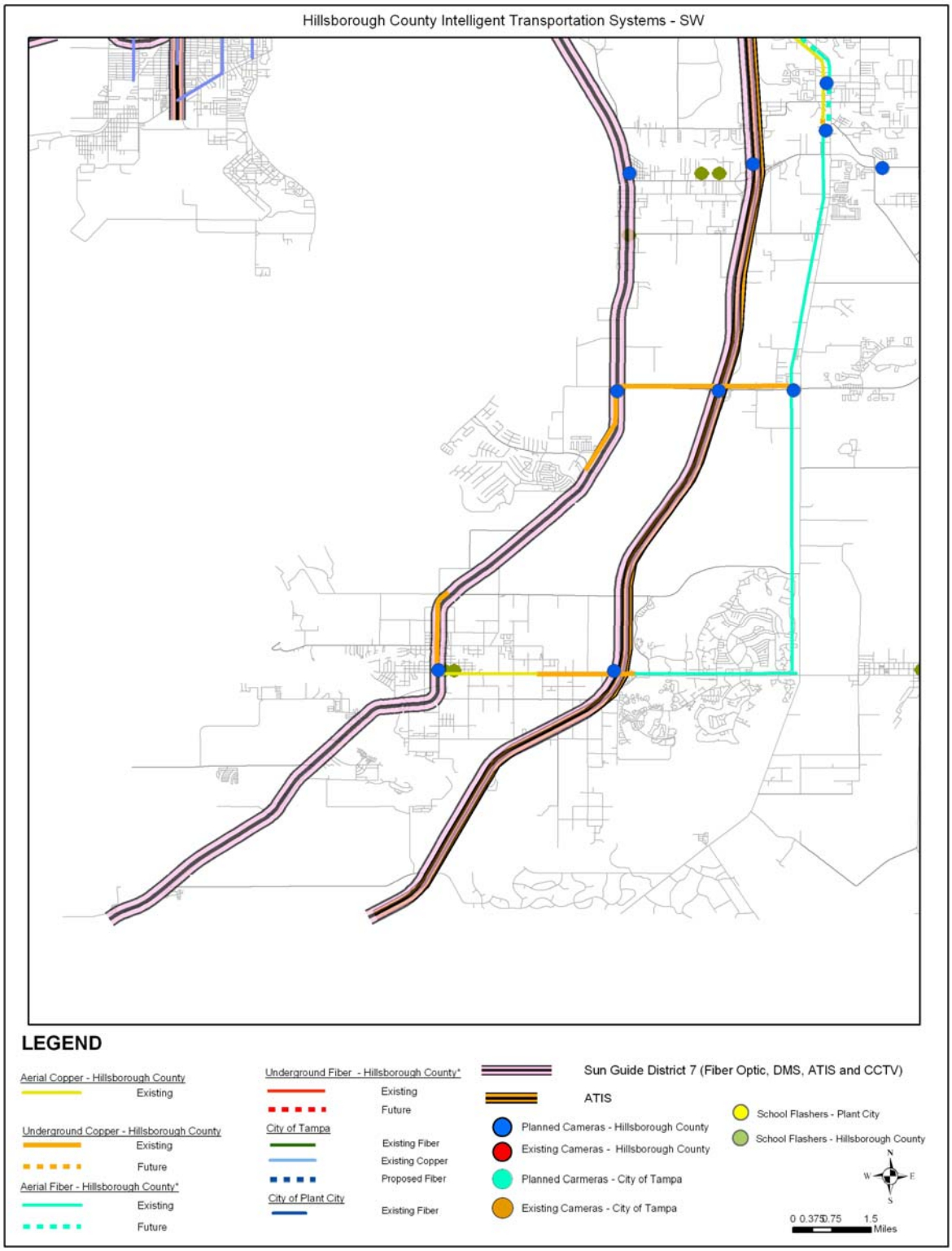
Map C-1: Hillsborough County ITS (Northwest)



Map C-2: Hillsborough County ITS (Northeast)



Map C-3: Hillsborough County ITS (Southwest)



APPENDIX D

D-1: TIP Evaluation Forms

D-1: TIP Evaluation Forms

STP PROJECT EVALUATION FORM
SCORING CRITERIA

PROJECT: _____

CRITERIA	POINTS
Consistency	
• Based on CMS Study and/or in 2025 LRTP Interim Plan funded with STP (TMA) Funds [Note: Projects expressly identified (6 points) or referenced under a program category (3 points) in the 2025 LRTP]	
• Prevent system breakdown on key system (high=6, med=4, low=2, no impact=0)	
• Preserves existing system (6 points if applicable)	
Improve Efficiency and Effectiveness of Transportation System	
• Safety (high=6, med=4, low=2, no impact=0)	
• Congestion Relief (high=6, med=4, low=2, no impact=0)	
• Congestion Prevention (high=6, med=4, low=2, no impact=0)	
• Alerts travelers to hazards and delays (6 points if applicable)	
• Efficiently manages incidents (6 points if applicable)	
Intermodal Connectivity	
• Project efficiently transfers goods across modes such as truck, water, air (high=6, med=4, low=2, no impact=0)	
• Project efficiently transfers people across modes such as transit, carpool, bicycle (high=6, med=4, low=2, no impact=0)	
Community Impacts	
• Promotes land use policies: (1) supports increased density; (2) promotes efficient land use; (3) reduces auto dependency (all three=6, two of three=4, one of three=2, none=0).	
• Project is supported by a majority of community residents (strong support=6, some support=4, neither support nor opposition=2, opposition=0)	
• Modal shift: promotes shift from SOV (directly promotes=6, indirect shift=4, low impact=2, no impact=0).	
Completion of Project	
• Projects with PD&E, Design, or ROW, and projects to complete missing gaps in system are given higher score (high=6, med=4, low=2, no impact=0)	
Total:	

ENHANCEMENT PROJECT EVALUATION FORM
SCORING CRITERIA

PROJECT: _____

CRITERIA	POINTS
Supports Pedestrian & Bicycle Trips	
• Improves safety (high=6, med=4, low=2, no impact=0)	
• Improves connectivity (high=6, med=4, low=2, no impact=0)	
• Satisfies unmet demand (high=6, med=4, low=2, no impact=0)	
• Regionally significant (high=6, med=4, low=2, no impact=0)	
• BPAC recommendation (top two=6, top four=4, top six=2)	
Enhances Scenic Resources	
• Improves transportation system aesthetically, such as with landscaping, beautification, sign removal, scenic views (high=6, med=4, low=2, no impact/not applicable=0)	
• Aesthetic routing or design of transportation facilities (high=6, med=4, low=2, no impact/not applicable=0)	
• Enhances state- or federally-designated scenic highways (yes=6)	
Enhances Historic, Cultural, and Archeological Resources	
• Enhances historic transportation facilities (high=6, med=4, low=2, no impact/not applicable=0)	
• Enhances significant archeological resources along transportation corridors, or enhances historic resources viewed prominently from transportation corridors. (high=6, med=4, low=2, no impact/not applicable=0)	
• Improves access to significant historic, cultural, or archeological resources along transportation corridors (high=6, med=4, low=2, no impact/not applicable=0)	
• Preserves and/or re-uses abandoned railway corridors (yes=6)	
• Enhances state or federally-designated historic highways or sites on National Register of Historic Places (yes=6)	
Environmental Mitigation	
• Enhances ecological resources along transportation corridors (high=6, med=4, low=2, no impact/not applicable=0)	
• Mitigates water pollution due to highway stormwater run-off (high=6, med=4, low=2, no impact/not applicable=0)	
• Reduces vehicle-caused wildlife mortality while maintaining habitat connectivity (high=6, med=4, low=2, no impact/not applicable=0)	
Educational	
• Enhances visitor appreciation of a transportation facility (interpretive, educational, welcoming) (high=6, med=4, low=2, no impact/not appl=0)	
• Raises awareness of bicycle or pedestrian resources or other enhanced transportation resources, such as scenic, historic, or environmental resources, as part of the transportation system (high=6, med=4, low=2, no impact/not applicable	
• Enhances understanding of transportation safety, particularly the safety of bicyclists and pedestrians. (high=6, med=4, low=2, no impact/not appl=0)	
Maximizing Enhancement Program Impact	
• Augments this year's enhancement program funding with funding from other sources and/or other years. (high=6, med=4, low=2, no impact/not appl=0)	
Consistency	
• Project identified in 2025 LRTP Interim Plan *****, i.e., 2007-2015 – Cost Affordable	
[Note: Projects expressly identified (30 points) or referenced under a program category (15 points) in the 2025 LRTP]	
Total:	

Reviewer: _____

APPENDIX E

E-1: CMP Relationship to Local Growth Management Requirements

E-1: CMP Relationship to Local Growth Management Requirements

City of Temple Terrace

Concurrency Management System:	The city's CMS as mandated by the state and set forth in Sec. 25.9 of the city code of ordinances precludes the development of any property where that development would reduce the LOS on any supporting facility below the established acceptable level of service. Except for those properties located within the designated Transportation Concurrency Exception Area (TCEA).
Proportionate Fair-Share:	In accordance with the provisions set forth in s. 163.3180(16), The City of Temple is developing a proportionate fair-share ordinance which allows for the advanced contribution of funds to offset the cost of the provision of infrastructure. This provision allows development to occur on select parcels which would otherwise be restricted from development because it would exceed allowable LOS standards.
Trip Reduction:	The City of Temple Terrace is working to addresses the problem of traffic congestion by developing additional mixed use land use categories that allow for higher densities which will produce more compact development thus reducing the need for the use of vehicles for daily trips.
Land Use Policy / Mode Shift:	The City is implementing a downtown redevelopment plan that will in large part center on pedestrian accessibility. The focus of the plan is to create a "park once" destination. This pedestrian focus is expected to reduce the number of daily vehicle trips in the city.
Land Use Policy / Mode Shift :	Through Policy 1.1.11 of the Traffic Circulation and Mass Transit Element of the Temple Terrace Comprehensive Plan. The city has dictated that within the TCEA all parcels within ¼ mile of a transit stop shall be served by

	pedestrian facilities of LOS C or better, and that 80% of employees and dwelling units in the TCEA shall be located within ½ mile of a transit stop.

City of Plant City

Concurrency Management System:	The city's CMS as mandated by the state and set forth in Sec. 102-1900 to 1906 of the city code of ordinances precludes the development of any property where that development would reduce the LOS on any supporting facility below the established acceptable level of service. Except for those properties located within the designated Transportation Concurrency Exception Area (TCEA).
Impact Fees:	Sec. 86-106 to 120 of the Plant City Code of Ordinances establishes the impact fee program which requires new development to provide funds, road improvements, or ROW dedications to the expansion of current road capacity.
Proportionate Fair-Share:	In accordance with the provisions set forth in s. 163.3180(16), Sec. 102-2025 to 1035 of The Plant City Code of Ordinances establishes a proportionate fair-share program which allows for the advanced contribution of funds to offset the cost of the provision of infrastructure. This provision allows development to occur on select parcels which would otherwise be restricted from development because of the exceedance in allowable LOS standards.
Capital Assessment Areas:	Sec. 44 of the Plant City Code of Ordinances establishes the Capital Assessment Areas program. The program provides funding to capital improvements projects within an area of the city through fees collected from property located within that same designated area. This type of program serves to increase the road capacity, or to provide funding for alternative mode projects.

Mode Shift:	Plant City provides a special events circulator during peak traffic events to mitigate the impact of higher numbers of vehicles using the roads.
Freight Traffic Management:	Plant City has a course of designated Truck Routes within the city. The exclusion of trucks from some area of the city reduces congestion provides for a safer pedestrian environment
Traffic Operation:	Plant City has an initiative to monitor and adjust traffic signal timing to more appropriately direct traffic.

City of Tampa

Concurrency Management System:	The city's CMS as mandated by the state and set forth in Chapter 17.5 Article III of the city code of ordinances precludes the development of any property where that development would reduce the LOS on any supporting facility below the established acceptable level of service. Except for those properties located within the designated Transportation Concurrency Exception Area (TCEA).
Increase Density:	The city provides several Transportation Concurrency Exception Areas in an attempt to focus development in under developed or blighted urban areas.
Impact Fees:	Sec. 25-68 to 74 of the Tampa Code of Ordinances establishes the impact fee program which requires new development to provide funds, road improvements, or ROW dedications to the expansion of current road capacity.
Density Bonuses:	The Tampa Land Development Regulation as outlined in Sec. 27-328 awards density bonuses to developments that provide amenities such as transit improvements and other public benefit beyond that required by law.
Specific Exactions:	As stated in Sec. 22-134 of the Tampa Code of Ordinances all developments over a specified

	size thresholds must include in their development proposal accommodations for transit stops. Section 27-324 stipulates that bicycling parking facilities shall be provided in adequate number as determined by the zoning administrator for all nonresidential uses within a site plan zoning district.
Land Use:	Policies in the Tampa Comprehensive Plan mandate that any plan amendment proposing the Res-50 land use plan category shall be located on at least collector roads. Any plan amendment proposing Res-83 land use plan category shall be located on at least arterial roads.
Traffic Operation:	The City's Transportation Division routinely examines the timing and synchronization of traffic lights and other transportation control devices so as to minimize congestion and travel times. The Arterial Surveillance Program monitors traffic conditions by performing visual surveillance activities via a system of cameras. The information gathered from this program aids in reducing clearance times for accidents, and in the synchronization of traffic lights.
Access Management:	The comprehensive approach to the management and regulation of driveways, medians, median openings, traffic signals, and free way interchanges to limit and separate traffic conflict points thus increasing safe efficient traffic operation.
Mode Shift:	Through three Transportation Management Organizations (TMOs), the city is actively engaged in implementing transportation demand management strategies. The function of the TMOs is primarily center on education and facilitation of programs such as ridesharing, carpooling, van pooling,

	telecommuting, and a guaranteed ride home program.
Parking Management Program:	Policies in the Tampa Comprehensive Plan call for an increase in fees and or a limit on the amount of available parking located near activity centers.

Hillsborough County

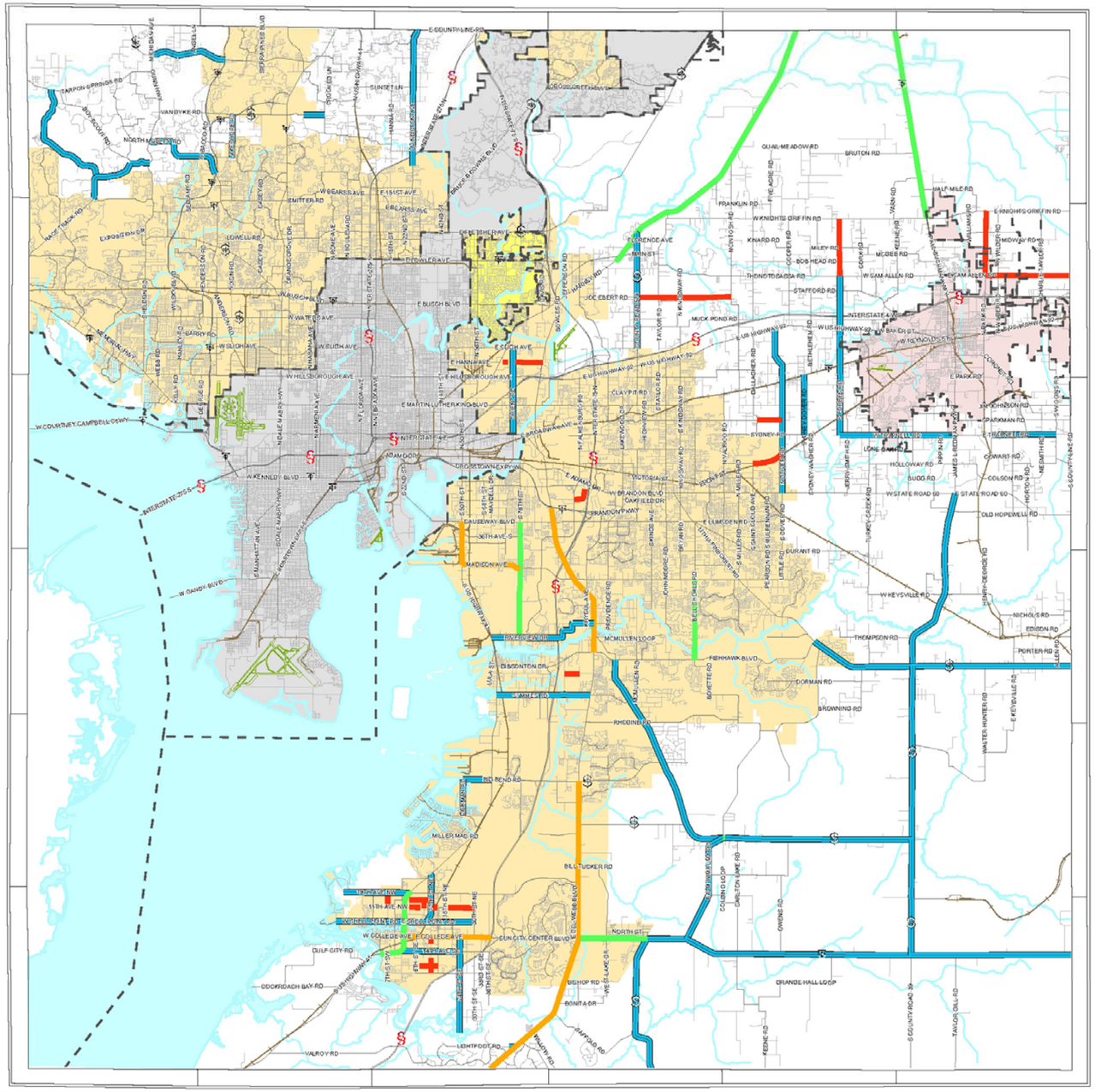
Adequate Public Facilities:	The city's adequate public facilities regulation as mandated by the state is set forth in Part 4.02 of the County Code of Ordinances precludes the development of any property where that development would reduce the LOS on any supporting facility below the established acceptable level of service.
Impact Fees:	Sec. 17.5-1 to 17.5-21 of the Hillsborough Code of Ordinances establishes the impact fee program which requires new development to provide funds, road improvements, or ROW dedications to the expansion of current road capacity.
Proportionate Fair-Share:	In accordance with the provisions set forth in s. 163.3180(16), Sec. 4.02.07 of The Hillsborough County Code of Ordinances establishes a proportionate fair-share program which allows for the advanced contribution of funds to offset the cost of the provision of infrastructure. This provision allows development to occur on select parcels which would otherwise be restricted from development because of the exceedance in allowable LOS standards.
Density Bonuses:	The Hillsborough County Land Development Code (LDC) as outlined in Sec. 5.08.03 awards density bonuses to developments that provide amenities such as transit improvements and other public benefit beyond that required by law.

Land Use / Trip Reduction:	In Sec. 3.02.05 of the County Land Development Code a density bonus is given to mixed use projects in IPD zoning districts that can demonstrate an internal trip capture rate during the peak hour. Various other zoning districts as outlined in Part 5.00 of the Hillsborough LDC allow for bonuses and credits when measures are implemented that encourage a reduction in trips, or the use of alternate modes of transportation.
Exactions / Mode Shift:	Part 6.02 of the LDC stipulates that the developer shall provide pedestrian and bicycle facilities on any roadway identified on the Comprehensive Bicycle Plan. Sidewalks shall be required in all land use categories, where necessary to provide for safe pedestrian circulation. Part 6.03 dictates that public transit facilities shall be provided on sites meeting the threshold requirements and located on public transit corridors or planned corridors as listed in the Long Range Transportation Plan, and based on the frequency and location criteria in established by HART Line and referenced in the Hillsborough County Transportation Technical Manual for Subdivisions and Site Development Projects.
Access Management:	Part 6.04 of the Hillsborough Development Code outlines a comprehensive approach to the management and regulation of driveways, medians, median openings, traffic signals, and free way interchanges to limit and separate traffic conflict points thus increasing safe efficient traffic operation.
Road Network Management:	Several sections of the Hillsborough LDC to include Sec. 3.12.09 make reference to “Street Network Connectivity”. This policy governing redevelopment investments within the Gateway District and Neighborhood Services districts is

directed at increasing the connectivity of the street and multi-use trail network thus decreasing traffic bottle necks in subdivisions and neighborhoods.

Corridor Preservation Program:

The Corridor Preservation Program as described in the Transportation Element of the Hillsborough County Comprehensive Plan and in Part 5.11.00 of the Hillsborough County Land Development Code, restricts the allowable use of land located adjacent to a series of designated road corridors. The purpose for the restricted land use is to allow for the future expansion of the roadway. A transfer of development rights program and clustering of structures bonus are used in the implementation of the program. See the attached map for the location of the roadways designated under this program.



Hillsborough County
CORRIDOR PRESERVATION PLAN

Proposed Comprehensive Plan Amendments

(BOCC approved on April 26, 2007. Pending State DCA approval.)

CORRIDORS PLAN AMENDMENTS:

- 2 LANES
- 4 LANES
- 6 LANES
- PAVED SHOULDERS/BIKE LANES

URBAN SERVICE AREA BOUNDARY

INCORPORATED AREAS

- TAMPA
- TEMPLE TERRACE
- PLANT CITY

3 1.5 0 3 Miles

Hillsborough County Florida

Planning & Growth Management Department
Administrative Services Division

Prepared by: R.E. Spaights
File: G:/Proj/Transp/CorridorPlan/HCCP_CPA_BL.mxd
Date: 05/09/07

APPENDIX F

F-1: 2007 Urban Mobility Report for Tampa-St. Petersburg

Performance Measure Summary

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2005. There is no single performance measure that experts agree "says it all." The best comparison of congestion levels and trends is done between regions of similar size, over several years, and with a few measures of congestion aspects. Examining a few measures over many years reduces the chance that data variations or the estimating procedures may have caused a "spike" in any single year. A few key points should be recognized by users of the Urban Mobility Report data.

Use the Trends – The multi-year performance measures are better indicators, in most cases, than any single year. (*5 years is 5 times better than 1 year*).

Use several measures – Each performance measure illustrates a different element of congestion. (*The view is more interesting from the top of a few measures*).

Compare to similar regions – Congestion analyses that compare areas with similar characteristics (for example population, growth rate, road and public transportation system design) are usually more insightful than comparisons of different regions. (*Los Angeles is not Peoria*).

Compare ranking changes and performance measure values – In some performance measures a small change in the value may cause a significant change in rank from one year to the next. This is the case when there are several regions with nearly the same value. (*15 hours is only 1 hour more than 14 hours*).

Consider the scope of improvement options – Any improvement project in a corridor within most of the regions will only have a modest effect on the regional congestion level. (*To have an effect on areawide congestion, there must be significant change in the system or service*).

Comparison of Several Key Mobility Performance Measures
Large Group – 1 million to 3 million population urban areas

Urban Area	Delay per Traveler	Travel Time Index	Total Delay	1982 to 2005	
				Delay per Traveler	Total Delay
San Diego, CA	H+	H+	H+	F+	F+
Minneapolis-St. Paul, MN	H	0	H+	F+	F+
Baltimore, MD	H	H	H+	F	F+
Tampa-St. Petersburg, FL	**H+**	**H**	**H+**	**S**	**F+**
St. Louis, MO-IL	L	L-	0	S	0
Denver-Aurora, CO	H+	H+	H+	F+	F+
Pittsburgh, PA	L-	L-	L-	S-	S-
Riverside-San Bernardino, CA	H+	H+	H+	F+	F+
Cleveland, OH	L-	L-	L-	S-	S-
Sacramento, CA	H	H+	H	0	F+
Portland, OR-WA	0	H	0	0	0
San Jose, CA	H+	H+	H+	F	F+
Cincinnati, OH-KY-IN	L-	L	L	S	S-
Virginia Beach, VA	L	L	L	S-	S-
Kansas City, MO-KS	L-	L-	L-	S-	S-
Milwaukee, WI	L-	L-	L-	S-	S-
Las Vegas, NV	0	H	L	F	0
Orlando, FL	H+	H	H	F+	F+
San Antonio, TX	0	0	L	F	S
Providence, RI-MA	L-	L-	L-	0	S-
Columbus, OH	L	L	L	F	S-
Buffalo, NY	L-	L-	L-	S-	S-
New Orleans, LA	L-	L-	L-	S-	S-
Indianapolis, IN	H	0	L	0	S-
Memphis, TN-MS-AR	L	L-	L-	0	S-

0 – Average congestion levels or average congestion growth
H Higher congestion; H+ Much higher congestion; F Faster congestion growth; F+ Much faster growth
L Lower congestion; L- Much lower congestion; S Slower congestion growth; S- Much slower growth

Performance Measures and Definition of Terms

Travel Time Index – A measure of congestion that focuses on each trip and each mile of travel. The ratio of travel time in the peak period to travel time in free-flow. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak.

Peak Travelers – Number of travelers (using any travel mode) who begin a trip during the morning or evening peak travel periods (6 to 9 a.m. and 4 to 7 p.m.).

Annual Delay per Traveler – A yearly sum of all the per-trip delays. This measure illustrates the effect of the per-mile congestion as well as the length of each trip. The extra time required to travel in the peak period is divided by the number of travelers who begin a trip during the peak period (6 to 9 a.m. and 4 to 7 p.m.).

Total Delay – The overall size of the congestion problem. Measured by the total travel time above that needed to complete a trip at free-flow speeds. The ranking of total delay usually follows the population ranking (larger regions usually have more delay).

Free-Flow Speeds (60 mph on freeways and 35 mph on arterials) – These values are used as the national comparison thresholds. Other speed values may be appropriate for urban areas or sub-regions.

Excess Fuel Consumed – Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

Public Transportation – Regular route service from all public transportation providers in an urban area.

Operations Treatments – Freeway incident management, freeway ramp metering, arterial street signal coordination and arterial street access management.

Congestion Cost – Value of travel delay for 2005 (estimated at $14.60 per hour of person travel and $77.10 per hour of truck time) and excess fuel consumption (estimated using state average cost per gallon).

Annual Increase Needed to Maintain Constant Congestion Level – Number of lane-miles that must be added to the road system each year – or – the number of new transit riders or carpoolers that must be added to keep congestion levels the same as the previous year.

Urban Area – The developed area (population density more than 1,000 persons per square mile) within a metropolitan region. The urban area boundaries change frequently (every year for most growing areas). The annual change in miles traveled, therefore, includes both new travel due to growth and travel that previously occurred in areas designated as rural.

Number of Rush Hours – Time when system might have congestion

Key Mobility Performance Measure Labels

Note: Designation of an urban area congestion problem as "Much higher", "Much faster growth", etc. is determined using a general indicator of the accuracy of the congestion estimates. For regions with the same indicator label, there may be no difference in congestion levels. Different values are used for the indicators in regions over 1 million population and below 1 million population.

Measures	Differences Within These Values May Not Indicate a Difference in Congestion Level	
2005 Values	**Above 1M Population**	**Below 1M Population**
Delay per Traveler -	5 Hours	3 Hours
Travel Time Index -	5 Index Points	3 Index Points
Total Delay -	5 Hours x Average Population	3 Hours x Average Population
1982 to 2005 Trends		
Delay per Traveler -	5 Hours	3 Hours
Total Delay -	5 Hours x Average Population	3 Hours x Average Population

The Mobility Data for Tampa-St. Petersburg, FL

Inventory Measures	2005	2004	2003	2002	2001	2000
Urban Area Information						
Population (1000s)	2,250	2,215	2,050	2,025	2,000	1,945
Rank	18	18	19	20	20	19
Urban Area (square miles)	1,350	1,350	1,345	1,340	1,340	1,335
Popn Density (persons/sq mile)	1,667	1,641	1,524	1,511	1,493	1,457
Peak Travelers (1000s)	1,242	1,216	1,119	1,089	1,058	1,013
Freeway						
Daily Vehicle-Miles of Travel (1000s)	13,050	12,980	12,000	11,100	10,400	9,700
Lane Miles	850	840	810	785	750	725
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	28,000	27,340	24,675	24,200	22,605	21,000
Lane Miles	3,750	3,700	3,480	3,355	3,225	3,100
Public Transportation						
Annual Psgr-Miles of Travel (millions)	112	106	100	94	86	87
Annual Unlinked Psgr Trips (millions)	23	21	20	20	20	19
Cost Components						
Value of Time ($/hour)	14.60	14.10	13.75	13.45	13.25	12.85
Commercial Cost ($/hour)	77.10	74.60	72.65	71.05	69.95	68.00
Fuel Cost ($/gallon)	2.34	1.99	1.53	1.41	1.51	1.54
System Performance						
Congested Travel (% of peak VMT)	69	67	64	63	57	57
Congested System (% of lane-miles)	66	65	64	63	58	58
Congested Time (number of "Rush Hours")	7.6	7.6	7.4	7.4	7.4	7.2
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	275	321	264	267	238	199
Transit Riders or Carpoolers (millions)	85	99	78	79	69	56
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	35,281	35,556	31,146	29,157	26,524	23,449
Rank	20	20	20	20	21	22
Fuel per Peak Traveler (gallons)	28	29	28	27	25	23
Rank	25	24	21	22	22	27
Annual Delay						
Total Delay (1000s of person-hours)	56,203	55,783	51,331	48,238	44,040	38,644
Rank	19	17	19	20	19	21
Delay per Peak Traveler (person-hrs)	45	46	46	44	42	38
Rank	20	14	11	13	17	22
Delay due to Incidents (percent)	54	54	54	54	54	54
Travel Time Index	1.28	1.29	1.28	1.27	1.26	1.25
Rank	23	18	19	17	20	18
Congestion Cost						
Total Cost ($ millions)	1,005	959	839	765	692	591
Rank	19	19	19	20	20	22
Cost per Peak Traveler ($)	809	789	749	702	654	584
Rank	24	21	17	19	19	25

Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

Note: Zeroes in the table reflect values less than 0.5.

The Mobility Data for Tampa-St. Petersburg, FL, Continued

Inventory Measures	1999	1998	1997	1996	1995	1994
Urban Area Information						
Population (1000s)	1,895	1,865	1,845	1,840	1,830	1,780
Rank	19	19	19	19	19	19
Urban Area (square miles)	1,325	1,315	1,305	1,300	1,290	1,270
Popn Density (persons/sq mile)	1,430	1,418	1,414	1,415	1,419	1,402
Peak Travelers (1000s)	970	940	915	898	878	842
Freeway						
Daily Vehicle-Miles of Travel (1000s)	9,100	8,500	8,110	7,845	7,615	7,165
Lane Miles	690	650	615	585	545	510
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	19,550	18,700	17,730	16,840	16,205	15,405
Lane Miles	2,875	2,700	2,545	2,465	2,345	2,200
Public Transportation						
Annual Psgr-Miles of Travel (millions)	85	87	79	82	92	92
Annual Unlinked Psgr Trips (millions)	19	19	17	17	19	19
Cost Components						
Value of Time ($/hour)	12.40	12.15	12.00	11.70	11.40	11.05
Commercial Cost ($/hour)	65.80	64.35	63.40	61.95	60.20	58.50
Fuel Cost ($/gallon)	1.14	1.07	1.17	1.30	1.20	1.08
System Performance						
Congested Travel (% of peak VMT)	58	58	58	61	62	62
Congested System (% of lane-miles)	59	59	59	63	63	63
Congested Time (number of "Rush Hours")	7.2	7.2	7.2	7.2	7.4	7.4
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	174	158	149	137	157	145
Transit Riders or Carpoolers (millions)	49	44	42	39	45	42
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	23,545	22,281	21,321	21,751	21,628	20,357
Rank	21	22	21	21	20	19
Fuel per Peak Traveler (gallons)	24	24	23	24	25	24
Rank	25	24	25	22	13	12
Annual Delay						
Total Delay (1000s of person-hours)	39,097	36,970	35,592	36,220	35,880	34,025
Rank	20	20	21	20	17	16
Delay per Peak Traveler (person-hrs)	40	39	39	40	41	40
Rank	19	15	17	10	10	10
Delay due to Incidents (percent)	54	54	54	54	54	54
Travel Time Index	1.27	1.26	1.27	1.29	1.30	1.30
Rank	16	13	12	6	6	4
Congestion Cost						
Total Cost ($ millions)	567	524	501	500	481	441
Rank	21	21	21	21	20	19
Cost per Peak Traveler ($)	585	557	547	557	548	524
Rank	22	18	20	15	11	11

Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

Note: Zeroes in the table reflect values less than 0.5.

The Mobility Data for Tampa-St. Petersburg, FL, Continued

Inventory Measures	1993	1992	1991	1990	1989	1988
Urban Area Information						
Population (1000s)	1,755	1,730	1,725	1,720	1,670	1,635
Rank	21	21	21	21	21	21
Urban Area (square miles)	1,230	1,200	1,160	1,130	1,090	1,055
Popn Density (persons/sq mile)	1,427	1,442	1,487	1,522	1,532	1,550
Peak Travelers (1000s)	816	792	776	762	735	713
Freeway						
Daily Vehicle-Miles of Travel (1000s)	6,825	6,300	5,850	5,315	5,000	4,885
Lane Miles	485	460	425	400	365	340
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	14,785	14,225	13,960	12,980	12,390	12,010
Lane Miles	2,110	2,035	1,990	1,945	1,900	1,870
Public Transportation						
Annual Psgr-Miles of Travel (millions)	91	89	98	46	46	45
Annual Unlinked Psgr Trips (millions)	19	18	19	9	9	8
Cost Components						
Value of Time ($/hour)	10.75	10.50	10.25	10.00	9.25	8.80
Commercial Cost ($/hour)	57.05	55.40	53.80	51.60	48.95	46.70
Fuel Cost ($/gallon)	1.13	1.12	1.10	1.05	1.08	1.00
System Performance						
Congested Travel (% of peak VMT)	64	63	64	62	62	61
Congested System (% of lane-miles)	64	64	61	60	60	60
Congested Time (number of "Rush Hours")	7.4	7.4	7.4	7.2	7.2	7.2
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	130	119	125	101	87	93
Transit Riders or Carpoolers (millions)	38	34	35	27	23	25
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	19,664	18,479	18,071	15,452	14,017	13,693
Rank	18	18	18	18	18	17
Fuel per Peak Traveler (gallons)	24	23	23	20	19	19
Rank	12	12	12	16	18	15
Annual Delay						
Total Delay (1000s of person-hours)	32,243	30,358	29,700	25,682	23,300	22,760
Rank	16	17	17	18	18	17
Delay per Peak Traveler (person-hrs)	40	38	38	34	32	32
Rank	10	10	10	14	14	14
Delay due to Incidents (percent)	54	54	54	53	53	53
Travel Time Index	1.30	1.29	1.30	1.27	1.26	1.26
Rank	4	4	3	4	5	4
Congestion Cost						
Total Cost ($ millions)	409	376	359	302	255	237
Rank	17	18	18	18	18	17
Cost per Peak Traveler ($)	501	474	462	396	347	332
Rank	11	12	12	14	17	15

Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

Note: Zeroes in the table reflect values less than 0.5.

The Mobility Data for Tampa-St. Petersburg, FL, Continued

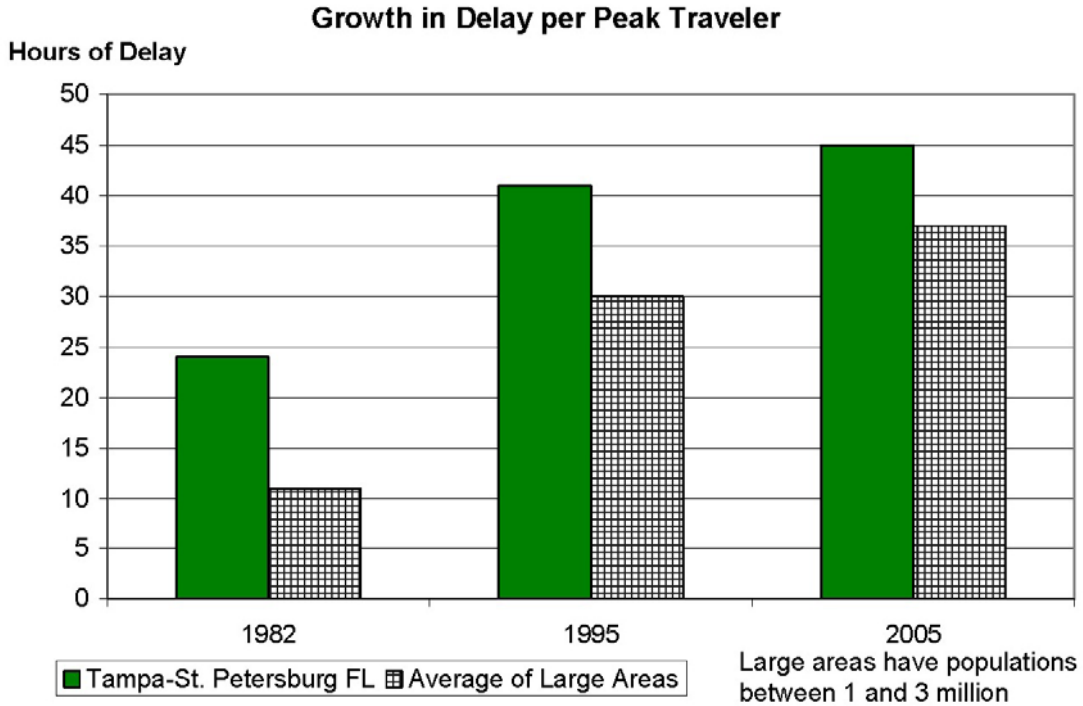
Inventory Measures	1987	1986	1985	1984	1983	1982
Urban Area Information						
Population (1000s)	1,610	1,565	1,520	1,485	1,455	1,420
Rank	21	21	21	21	21	21
Urban Area (square miles)	1,020	990	970	950	920	890
Popn Density (persons/sq mile)	1,578	1,581	1,567	1,563	1,582	1,596
Peak Travelers (1000s)	697	671	648	628	611	589
Freeway						
Daily Vehicle-Miles of Travel (1000s)	4,590	3,985	3,700	3,545	3,230	2,985
Lane Miles	310	290	280	270	260	250
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	11,655	11,420	11,115	10,855	10,500	10,300
Lane Miles	1,855	1,835	1,800	1,780	1,755	1,725
Public Transportation						
Annual Psgr-Miles of Travel (millions)	42	47	46	41	41	41
Annual Unlinked Psgr Trips (millions)	9	10	9	10	10	10
Cost Components						
Value of Time ($/hour)	8.50	8.20	8.00	7.75	7.45	7.20
Commercial Cost ($/hour)	44.85	43.30	42.50	41.05	39.35	38.10
Fuel Cost ($/gallon)	1.00	0.98	1.28	1.29	1.32	1.38
System Performance						
Congested Travel (% of peak VMT)	60	60	56	54	53	52
Congested System (% of lane-miles)	55	55	51	50	50	51
Congested Time (number of "Rush Hours")	7.2	7.2	7.0	7.0	6.6	6.6
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	89	- -	- -	- -	- -	- -
Transit Riders or Carpoolers (millions)	23	- -	- -	- -	- -	- -
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	13,128	11,895	10,501	10,032	9,114	8,638
Rank	17	17	17	16	14	14
Fuel per Peak Traveler (gallons)	19	18	16	16	15	15
Rank	12	9	10	8	8	8
Annual Delay						
Total Delay (1000s of person-hours)	21,926	19,591	17,411	16,872	15,197	14,273
Rank	17	16	16	15	14	13
Delay per Peak Traveler (person-hrs)	31	29	27	27	25	24
Rank	11	9	10	8	8	6
Delay due to Incidents (percent)	53	53	53	53	53	53
Travel Time Index	1.26	1.25	1.23	1.22	1.21	1.20
Rank	3	4	4	3	3	2
Congestion Cost						
Total Cost ($ millions)	221	190	168	158	138	126
Rank	17	16	16	15	14	13
Cost per Peak Traveler ($)	317	283	260	252	226	214
Rank	11	9	11	9	9	8

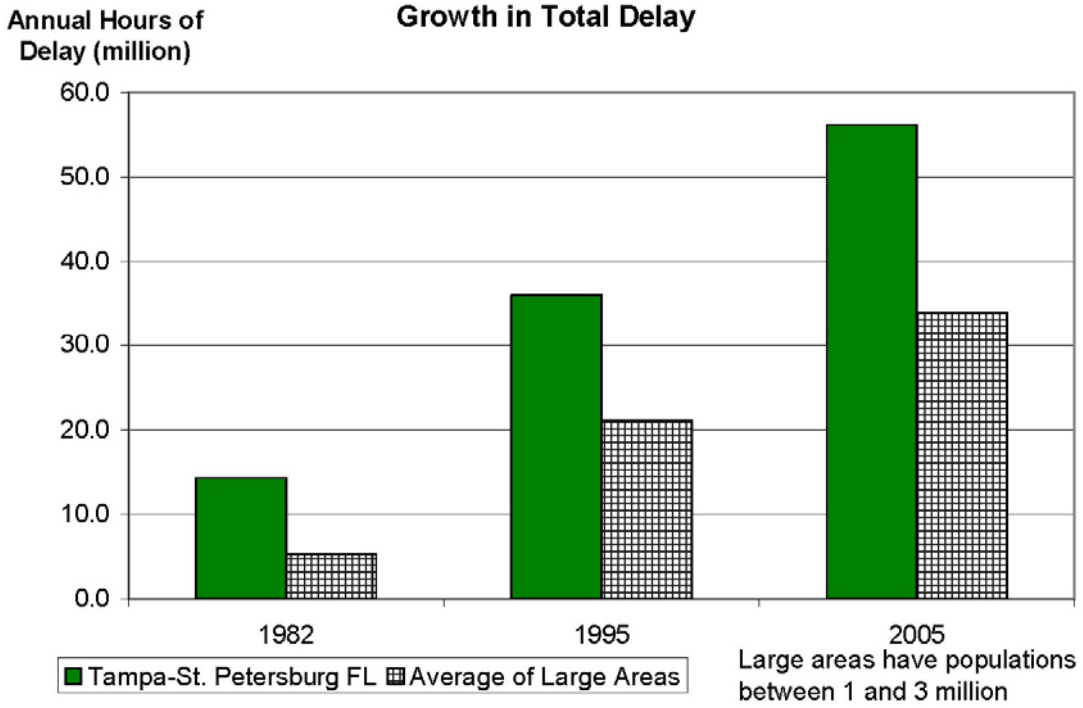
Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

Note: Zeroes in the table reflect values less than 0.5.

Benefits From Public Transportation Service and Operations Strategies for Tampa-St. Petersburg, FL

Operations Strategies	2005	2004	2003	2002	2001	2000
Freeway Ramp Metering						
Percent of Roadway Miles	--	--	--	--	--	--
Annual Delay Reduction (1000 hours)	--	--	--	--	--	--
Freeway Incident Management						
Cameras						
Percent of Roadway Miles	23	23	18	8	8	8
Service Patrols						
Percent of Roadway Miles	62	40	39	38	24	9
Annual Delay Reduction (1000 hours)	789	600	529	382	309	129
Arterial Signal Coordination						
Percent of Roadway Miles	62	61	47	42	39	40
Annual Delay Reduction (1000 hours)	299	213	192	177	170	161
Arterial Access Management						
Percent of Roadway Miles	52	52	55	58	60	62
Annual Delay Reduction (1000 hours)	2,434	2,547	2,364	2,075	2,079	1,940
HOV Lanes						
Daily Passenger-miles of Travel (1000s)	--	--	--	--	--	--
HOV User Delay Savings	--	--	--	--	--	--
Total Effect of Operations Treatments						
Annual Delay Reduction (1000 hours)	3,522	3,360	3,086	2,634	2,559	2,230
Annual Delay Saved per Peak Traveler (hours)	3	3	3	2	2	2
Annual Congestion Cost Savings ($million)	62.5	57.1	49.9	41.5	39.6	33.5
Travel Time Index with Strategies	1.282	1.290	1.278	1.270	1.260	1.246
Travel Time Index (Base)	1.297	1.305	1.292	1.283	1.273	1.258
Public Transportation Service						
Existing Service						
Annual Passenger-miles of Travel (million)	112	106	100	94	86	87
Unlinked Passenger Trips (million)	23	21	20	20	20	19
Travel Time Index (combined road and transit)	1.275	1.284	1.272	1.264	1.254	1.241
Condition if Public Transportation Service were Discontinued						
Travel Time Index	1.301	1.307	1.295	1.285	1.275	1.261
Annual Delay Increase (1000 hours)	1,282	1,032	954	898	879	884
Annual Delay Increase per Peak Traveler (hours)	1	1	1	1	1	1
Annual Congestion Cost Increase ($million)	22.8	17.7	15.6	14.3	13.8	13.5


Growth in Delay per Peak Traveler
Hours of Delay
50
45
40
35
30
25
20
15
10
5
0
1982
1995
2005
Tampa-St. Petersburg FL
Average of Large Areas
Large areas have populations between 1 and 3 million


Growth in Total Delay
Annual Hours of Delay (million)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1982
1995
2005
Tampa-St. Petersburg FL
Average of Large Areas
Large areas have populations between 1 and 3 million

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