MIAMI-DADE TRANSPORTATION PLANNING ORGANIZATION

2045 LRTP

SUPPORTING DOCUMENTS

MIAMI-DADE COUNTY CONGESTION MANAGEMENT PROCESS UPATE 2019

SEPTEMBER 2019

MIAMI-DADE

2045 LONG RANGE TRANSPORTATION PLAN (LRTP)

MIAMI-DADE COUNTY

CONGESTION MANAGEMENT PROCESS UPDATE 2019

This document was prepared by the Miami-Dade Transportation Planning Organization (TPO) in collaboration with the Florida Department of Transportation (FDOT) District Six, Miami-Dade Expressway Authority (MDX), Florida's Turnpike Enterprise (FTE), South Florida Regional Transportation Authority (SFRTA), Miami-Dade Department of Transportation and Public Works (DTPW), Miami-Dade Regulatory and Economic Resources (RER) Department, Miami-Dade Aviation Department (MDAD), Miami-Dade Seaport Department, Miami-Dade County Office of Strategic Business Management, City of North Miami, City of Hialeah, City of Miami, City of Miami Beach, City of Miami Gardens, City of Homestead, Miami-Dade County Public Schools, Miami-Dade TPO Citizens' Transportation Advisory Committee (CTAC), Miami-Dade TPO Bicycle/ Pedestrian Advisory Committee (BPAC), Miami-Dade TPO Freight Transportation Advisory Committee (FTAC), Transportation Aesthetics Review Committee (TARC), Broward County Metropolitan Planning Organization (MPO), Palm Beach County Transportation Planning Agency (TPA), and the South Florida Regional Planning Council (SFRPC).

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MIAMI-DADE COUNTY CONGESTION MANAGEMENT PROCESS UPDATE 2019

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BACKGROUND

Pursuant to Title 23 U.S. Code § 134 – Metropolitan Transportation Planning, a congestion management process (CMP) is required in Transportation Management Areas (TMA), which are metropolitan areas with population greater than 200,000. Congestion management is the application of strategies to improve transportation system performance and reliability by reducing the adverse impacts of congestion on the movement of people and goods. A CMP is a systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. The CMP is intended to move these congestion management strategies into the funding and implementation stages.[1]

The concept of a CMP evolved from Congestion Management System, which was first introduced by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and continued under the Transportation Equity Act for the 21st Century (TEA-21). Starting from the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), it has been referred to as a congestion management process, reflecting that the goal of the law is to utilize a process that is an integral component of metropolitan transportation planning.

The CMP is intended to be an ongoing process, fully integrated into the metropolitan transportation planning process; the CMP is also a living document, continually evolving to address the results of performance measures, concerns of the community, new objectives and goals of the TPO, and up-to-date information on congestion issues. The CMP shall be developed and implemented as an integrated element of the metropolitan planning process.

FEDERAL AND STATE REQUIREMENTS ON CMP

Title 23 CFR Section 450.322 documents Federal Requirements on the CMP in TMAs. These requirements are summarized below:[2]

» The transportation planning process in a TMA shall address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53 through the use of travel demand reduction, job access projects, and operational management strategies.

[1] Congestion Management Process: A Guidebook, Federal Highway Administration, U.S. DOT, April 2011.

[2] https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=40792635be9b5cd1991146eb77aae229&mc=true&n=sp23.1.450.c&r=SUBPART&ty=HTML#se23.1.450_1322, accessed on May 20, 2019

» The congestion management process shall be developed, established, and implemented as part of the metropolitan transportation planning process that includes coordination with transportation system management and operations activities. The congestion management process shall include:

1. Methods to monitor and evaluate the performance of the multimodal transportation system and its congestion;
2. Definition of congestion management objectives and appropriate performance measures that are tailored to the specific needs of the area with other stakeholders in the covered area;
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, such as demand management measures, traffic operational improvements, public transportation improvements, ITS technologies, and where necessary, additional system capacity;
5. Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy proposed for implementation; and
6. Implementation of a process for periodic assessment of the effectiveness of implemented strategies.

» In TMAs designated as nonattainment for ozone or carbon monoxide pursuant to the Clean Air Act, the congestion management process shall 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 SOVs is proposed to be advanced with Federal funds.

MIAMI-DADE TPO CMP

The Miami-Dade Transportation Planning Organization (TPO) has an established congestion management process. This report documents the update to the 2014 Miami-Dade Congestion Management Process, which describes in detail Miami-Dade TPO's CMP and executive mechanism, identifies congested spots and corridors, and identifies strategies for these hotspots and corridors. In this 2019 CMP update, all 2014 CMP components were re-evaluated and updated. Congestion management strategies were developed for the identified hotspots and congested corridors and funding sources were identified for implementing these strategies.

CONGESTION MANAGEMENT EFFORTS IN PLACE

The Transportation Planning Organization, working with the County, FDOT, municipalities, and other transportation partners have a long history of implementing successful congestion management programs and projects, a few key examples of which are described below.

SOUTH FLORIDA COMMUTER SERVICES

The South Florida Commuter Assistance Program was founded in 1988 by the Florida Department of Transportation (FDOT) to serve as a public information office during the I-95 expansion project. The program has evolved into a one-stop shop for commuter information for programs and services in Miami-Dade, Broward, Palm Beach, Martin, and St. Lucie counties. The program is dedicated to improving traffic conditions by promoting alternatives to drive-alone commuting.

TRI-RAIL

The three-county commuter rail service has provided passenger service on the CSX railroad since 1989, also formed as part of the I-95 expansion project to provide relief to north-south commuters during the construction-related lane closures. In 2003, the Florida Legislature created the South Florida Regional Transportation Authority (SFRTA) which assumed the operational responsibility for Tri-Rail. Recent developments have been focused on the Tri-Rail Coastal Link service, to parallel the CSX service on the FEC line which would serve downtown Miami.

FREEWAY EXPRESS BUS SERVICES

Express buses are operated in freeway express lanes on I-95 by Miami-Dade Department of Transportation and Public Works (DTPW) and Broward County Transit. A number of routes connect commuters from northern Miami-Dade County and Broward County via several Park & Ride locations with Downtown Miami and Miami Civic Center area. Ridership is robust and allows hundreds of travelers to avoid driving themselves on I-95. Instead, commuters share a bus and have the opportunity to either relax during the journey or to work remotely.

MUNICIPAL TROLLEY SERVICES

In addition to the County's Metrobus services, twenty seven (27) municipalities operate a circulator bus or trolley service, partner with another municipality, or partner with DTPW to supplement the County's transit routes without duplication of service.

PRIVATE TRANSPORTATION NETWORK COMPANIES

Virgin Trains USA, formerly Brightline, is perhaps the best recent example of a partnership with a major private provider of transportation services to their significant downtown MiamiCentral station, which will also serve Tri-Rail in the future. In addition, the TPO works with Transportation Network Companies (TNC's) including Lyft and Uber to enhance mobility options for residents and visitors.

COMPONENTS OF THE 2019 CMP UPDATE

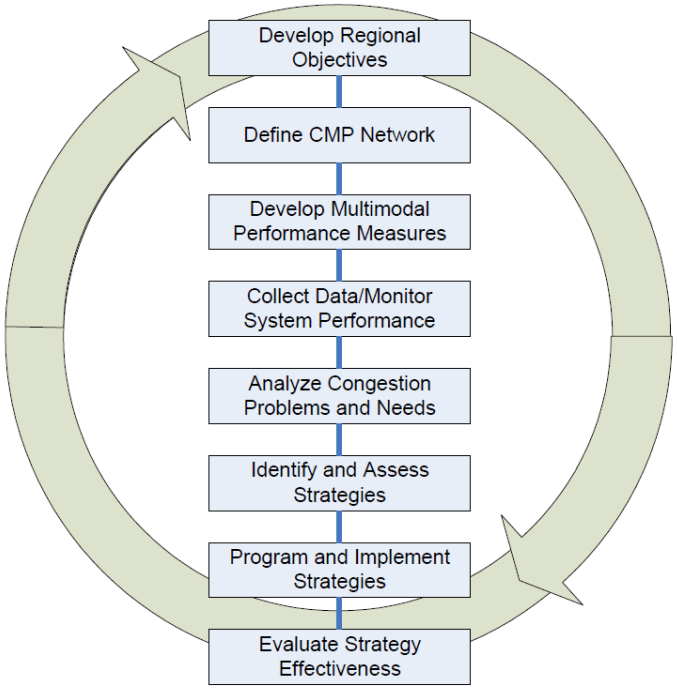
According to the FHWA *Congestion Management Process: A Guidebook*, a successful CMP model is built upon eight actions including:

1 **Develop regional objectives for congestion management**: it may not be feasible or desirable to try to eliminate all congestion; therefore, it is important to define objectives for congestion management that achieve the desired outcome.

2 **Define CMP network:** this action defines both the geographic scope and system elements that will be analyzed in the CMP.

3 **Develop multimodal performance measures (PMs):** this action involves developing PMs that will be used to measure congestion on both a regional and local scale.

FIGURE 1- ELEMENTS OF THE CMP



Source: *Congestion Management Process: A Guidebook, FHWA*

4 **Collect data/monitor system performance:** after PMs are defined, data should be collected and analyzed to determine system performance.

5 **Analyze congestion problems and needs:** this action involves identification of existing and future congestions and causes of unacceptable congestion.

6 **Identify and assess strategies:** this action involves both identifying and assessing potential strategies to mitigate congestion.

7 **Program and implement strategies:** this action involves including strategies in the Long Range Transportation Plan (LRTP), determining funding sources, prioritizing strategies, allocating funding in the TIP, and ultimately, implementing these strategies.

8 **Evaluate strategy effectiveness:** this action involves assessment of implemented CMP strategies and is designed to inform future decision-making about effectiveness of transportation strategies in the region.

This eight-step CMP model was followed by the study team in the 2019 Miami-Dade CMP update process. With the understanding that the CMP is an ongoing process which requires continuous data collection, performance monitoring and strategies assessment, CMP PMs, and data required (actions 3 and 4 above) are divided into two sets that serve two purposes in this update:

- **For the purpose of ongoing monitoring and evaluation:**
  - PMs developed to be used on continuously monitoring the performance of congested corridors and hotspots identified in Miami-Dade County, and
  - Data required to determine PMs for continuous monitoring and evaluation.

- **For the purpose of identifying future congestion:**
  - PMs developed to identify future congestion, and
  - Data required to determine PMs for identification of future congestion.

As with the 2014 CMP, the 2019 CMP is documented as input into the 2045 LRTP with the intention of integrating the CMP fully into the LRTP update process. The content of the document is organized around the eight actions in the order presented above.

CMP OBJECTIVES

The starting point of the CMP update is the update of objectives for congestion management. Defining congestion management objectives are also required as part of the CMP per Federal regulation 23 CFR 450.322 c) 2. In the 2019 CMP update, CMP objectives were drawn from Miami-Dade County's 2045 LRTP goals and objectives, which were updated from the goals of the 2040 LRTP with considerations of federal, state, and local requirements and plans and refined to reflect technology, planning emphasis areas, and current trends. **Table 1** documents the 2045 LRTP goals and corresponding objectives addressing congestion management:

TABLE 1 - CMP OBJECTIVES ADOPTED FROM THE 2045 LRTP

2045 LRTP GOALS	2045 LRTP OBJECTIVES
Maximize Mobility Choices Systemwide – LRTP Goal 1	Provide a comprehensive transportation network for dependable and reliable transportation options – LRTP Objective 1.1
	Reduce congestion – LRTP Objective 1.2
	Promote System Reliability– LRTP Objective 1.3
Support Economic Vitality – LRTP Goal 4	Improve access to employment centers – LRTP Objective 4.2
	Improve freight connectivity and access – LRTP Objective 4.4
Protect and Preserve the Environment and Quality of Life and Promote Energy Conservation – LRTP Goal 5	Promote projects that support urban infill and densification – LRTP Objective 5.3
	Improve the Quality of Life for all ages and abilities – LRTP Objective 5.5
Enhance the Integration and Connectivity of the System, Across and Between Modes, for People & Freight – LRTP Goal 6	Improve connectivity to SIS and intermodal facilities – LRTP Objective 6.1
Improve and Preserve the Existing Transportation System – LRTP Goal 8	Improve the resiliency/reliability of the transportation system – LRTP Objective 8.1

Source: Miami-Dade 2045 LRTP

These objectives serve as one of the primary points of connection between the CMP and LRTP and define the direction for the development of the CMP as a supplement to the LRTP.

CMP PERFORMANCE MANAGEMENT MEASURES

CMP is a performance-based process. The Federal Highway Administration (FHWA) supports performance-based programs like the CMP. Mobility performance management measures, along with other measures, were established in the Federal transportation legislation MAP-21 and carried forward into the FAST Act of 2015. CMP performance management measures are used to characterize current and future conditions on the transportation system in the region. They provide an indicator of Miami-Dade TPO's progress in meeting their goals and objectives. As mentioned in the introduction, with the understanding that the CMP is an on-going process that requires continuous data collection, performance monitoring and strategies assessment, CMP performance management measures and data required are divided into two sets that serve two purposes in this update: 1) ongoing monitoring and evaluation; and 2) future congestion identification. There are a number of measures that can be considered for use in the CMP. These measures generally indicate four dimensions of congestion as defined by the FHWA CMP Guidebook:

INTENSITY

The relative severity of congestion that affects travel. Intensity has traditionally been measured through indicators such as V/C ratios or LOS measures that consistently relate the different levels of congestion experienced on roadways.

DURATION

The amount of time the congested corridors persist before returning to an uncongested state.

EXTENT

The number of system users or components (e.g. vehicles, pedestrians, transit routes, lane miles) affected by congestion, for example the proportion of system network components (roads, bus lines, etc.) that exceed a defined performance measure target.

VARIABILITY

The changes in congestion that occur on different days or different times of day. When congestion is highly variable due to non-recurring conditions, such as a roadway with a high number of traffic accidents causing delays, this has an impact on the reliability of the system.

The PMs recommended here are most appropriate for use in Miami-Dade TPO's CMP and are consistent with FHWA recommendations as summarized in Miami-Dade's 2045 LRTP. Some of these are not supported by data currently available or affordable in Miami-Dade, however, they provide guidance to future data collection efforts when resources become available or affordable.

PERFORMANCE MANAGEMENT MEASURES FOR ONGOING MONITORING AND EVALUATION

System management measurements, as detailed within the 2045 LRTP, align with FHWA's final rule for system and freight performance measures entitled "National Performance Management Measures: Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program," effective May 20, 2017. States and MPOs must adopt two-year and four-year targets for these measures. The system and freight performance management measures which are applicable to Miami-Dade County are as follows:

- Percent Person-Miles Traveled on the Interstate that are Reliable,
- Percent Person-Miles Traveled on the Non-Interstate NHS that are Reliable, and
- Truck Travel Time Reliability (TTTR).

FDOT and the Miami-Dade TPO established two- and four-year targets for these performance management measures as detailed in **Table 2**. The effective identification and prioritization of congested corridors through this CMP process will aid in the TPO meeting these targets and act as an indication of future congestion identification.

TABLE 2 - FDOT AND TPO SYSTEM & FREIGHT NATIONAL PERFORMANCE MANAGEMENT MEASURE TARGETS

PERFORMANCE MANAGEMENT MEASURE	2-YEAR TARGET	4-YEAR TARGET
Percent of person-miles traveled on the Interstate that are reliable	75%	70%
Percent of person-miles traveled on the non-Interstate NHS that are reliable	n/a	50%
Truck travel time reliability ratio on the Interstate	1.75	2.0

Source: Miami-Dade 2045 LRTP

CMP NETWORK

Before conducting any CMP analysis, a specific geographic area and network of surface transportation facilities should be defined. In the previous 2014 CMP update, the CMP area of application was defined as the Miami-Dade County portion of the regional travel demand model (SERPM 7.0) area, and the CMP roadway network was defined as the Miami-Dade County portion of the SERPM 7.0 model network. In this 2019 CMP update, the CMP roadway network is defined as the Miami-Dade County portion of the National Performance Management Research Data Set (NPMRDS).[3] **Table 3** presents the approximate centerline miles and lane miles of the NPMRDS roadway network. **Figure 2** shows the map of the NPMRDS roadway network.

TABLE 3 - NPMRDS ROADWAY NETWORK CENTERLINE MILES AND LANE MILES

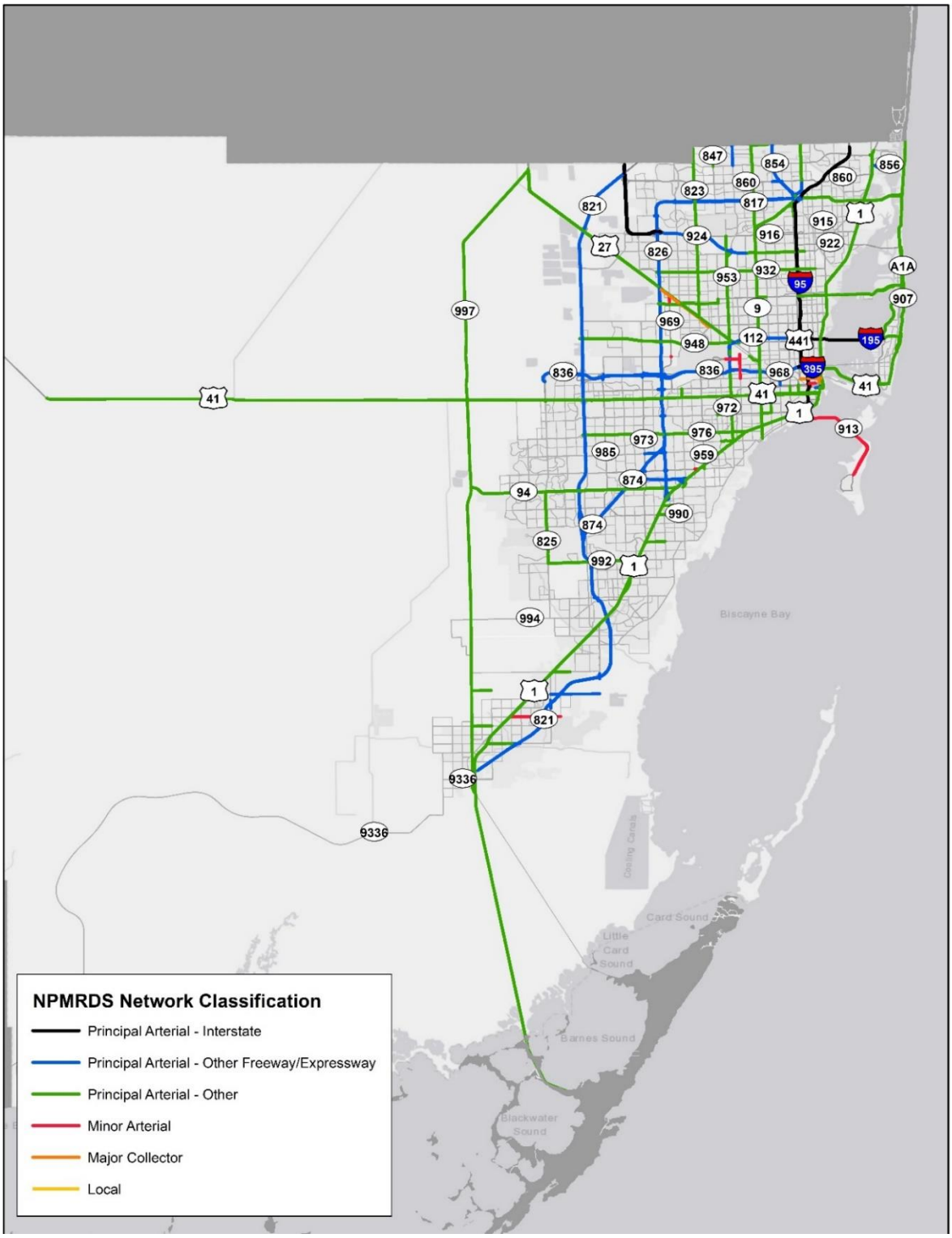
FUNCTIONAL CLASSIFICATION	CENTERLINE MILES	LANE MILES
Principal Arterial – Interstate	81	678
Principal Arterial – Other Freeway/Expressway	260	1,578
Principal Arterial – Other	612	2,651
Minor Arterial	25	116
Major Collector	10	36
Local	<1	<1
Total	**988**	**5,058**

Source: NPMRDS, Cambridge Systematics.

The 2019 CMP update process focuses on automobile congestion with transit, freight, and non-motorized modes evaluated through the 2045 LRTP update process as a separate effort. While these are not included in the CMP update process evaluation, they are included as potential strategies to alleviate this congestion.

[3] NPMRDS is made up of HERE and ATRI databases and provides vehicle probe-based travel time data for passenger cars and trucks. Data are collected from multiple sources including mobile devices, connected vehicles, portable navigation devices, commercial fleet, and sensors. This dataset includes historical average travel times in 5-minute increments on a daily basis covering the National Highway System (NHS).

FIGURE 2 - NPMRDS NETWORK



Source: *NPMRDS.*

CMP DATA COLLECTION PLAN

An integral part of performance measures development is supporting the process with a realistic data collection plan. The Miami-Dade TPO has been collecting and using data to support long range planning and congestion management processes for nearly a decade. Like many transportation agencies, the Miami-Dade TPO collects, maintains, and reports on a wide variety of internal and external PMs. Many of these PMs are used in the congestion management process. The methodologies for calculating CMP PMs call for multiple inputs; data used for the inputs can come from a number of sources.

Data available to the Miami-Dade TPO originates from multiple sources. Count station data is a reliable source for automobile and truck volumes at 15-minute, hourly and daily increments. Miami-Dade County and the Florida Department of Transportation (FDOT) have located hundreds of permanent and temporary count stations throughout the County. The data produced by the count stations is updated annually.

FDOT District 6 Traffic Management Center (TMC) also installed ITS devices, e.g., volume and speed detectors and CCTVs, along major highways districtwide, which are used to monitor real time traffic conditions and collect traffic volume and speed data. **Figure 3** maps out the locations of CCTVs in Miami-Dade County. Intersection specific data is required for arterial performance measurements. This data is obtained from the local municipalities through the collection of signal timing plans. To analyze highway adequacy an agency must have robust geometric data. The geometric data set accounts for area type, facility type, segment distance, number of through and turning lanes, posted speed limit, median type, and the presence of bike lanes and sidewalks. The volume, signal timing, and geometric data obtained through aerial imagery are used to report on Miami-Dade's highway adequacy.

CMP data that should be collected annually to report on Miami-Dade's highway adequacy include:

- Traffic volume counts
- Speed and travel time data
- Aerial photography-based congestion data
- Crash data
- Data for transit and non-motorized mode
- Travel survey data

Common data sources for the above mentions data are:

- Count station data
- Archived ITS and operations data
- Other electronic traffic datasets: cellphone data, etc.
- Aerial photography

Many of these data sources are already collected and freely and readily available. For instance, count station data and traffic volume counts are provided by FDOT. Aerial photography can be acquired through Google Maps or Google Earth. Crash data can be collected from a number of sources including through the National Highway Traffic Safety Administration's (NHTSA) Crash Report Sampling System (CRSS). Other data sources may be more difficult or costly to acquire such as cellphone data which may require additional data collection efforts at specific locations.

FIGURE 3 LOCATIONS OF FDOT D6 TMC ITS DEVICES – CCTVS

Source: https://sunguide.info/its-program/closed-circuit-television-cctv/, updated March 2019.

Along with traditional methods, Miami-Dade TPO should take advantage of current technologies and tools for data collection, processing, and analysis. Changes at the Federal level affect performance reporting at the state and MPO levels. This performance reporting now focuses on travel time reliability and causes a resulting shift in data used by the Miami-Dade TPO. As a result, this CMP relies upon the NPMRDS, provided free of charge to all MPOs by FHWA. Other similar sources, HERE and INRIX, are also options that have an associated cost. **Table 4** provides the major sources for travel time and speed data in Miami-Dade County. Acquiring data into the future may require utilizing ITS data for speeds and volumes or obtaining speed and volume data from the Regional Integrated Transportation Information System (RITIS).

TABLE 4 - POTENTIAL SOURCES FOR TRAVEL TIME AND SPEED DATA

	COST	GRANULARITY	DATA AVAILABILITY	VOLUME	COVERAGE
NPMRDS	Provided free of charge to MPOs by FHWA	5-minute speed data for both automobiles and trucks separately	New data is reported monthly – Historical data is made available	Does not include vehicle volumes	Covers the entire National Highway System (NHS)
HERE	Purchased by FDOT for internal use	5-minute speed data – granularity is fine as 20-second data	Real time data can be accessed any time – Historical data requires an archiving system e.g., RITIS	Does not include vehicle volumes	Larger network than the NPMRDS but has less data coverage
INRIX	Must be purchased form INRIX	5-minute speed data – granularity is as fine as 2-minute data	One time purchase affords unlimited access to data for the covered period	Does not include vehicle volumes	Covers more roads than the HERE data

Source: Cambridge Systematics, Inc.

IDENTIFICATION OF CONGESTED CORRIDORS

METHODOLOGY

The Miami-Dade County 2019 Congestion Management Process update improved upon the previous 2014 process by utilizing travel speed data from the National Performance Management Data Set (NPMRDS) and focusing on travel time reliability. This data set is a monthly archive of average travel times on the National Highway System (NHS), reported every five (5) minutes when data is available, and based on vehicle probe-based data from a number of sources including mobile phones, vehicles, and portable navigation devices. Separate average travel times are included for "all traffic", freight and passenger travel. FHWA provides access to the NPMRDS to MPO partners for their performance management activities.

The NPMRDS data set covers nearly 1,000 center lane miles within Miami-Dade County and over 5,000 lane miles total. Utilizing this dataset, the level of travel time reliability (LOTTR) can be computed for four traffic periods - AM Peak, Mid-day, PM Peak, and Night.

The benefits of using the NPMRDS data set include:

- A consistent national data set
- Continuously collected for NHS roadways with 5-minute resolution
- Available free to MPOs
- Allows annual – or more frequent – updates to identify where congestion is worsening or improving

If the LOTTR for any of these periods was found to be above 1.5[4] for a given segment, that segment was determined to be unreliable. These unreliable segments form the basis of the identified congested locations.

[4] Per FHWA FAST Act Performance Measures, April 2016.

The prioritization of the locations was determined based on the overall reliability described above and the observed speeds during the AM and PM peak periods as compared with the reference speed. These factors were each assigned a score, with a maximum score of 8, as described in the box below:

Scores to identify most-congested corridors:

- Unreliability Score: 0 points for no periods above 1.5
  - 1 point for 1 period above 1.5
  - 2 points for 2 periods above 1.5
  - 3 point for 3 period above 1.5
  - 4 points for 4 periods above 1.5
- AM Peak Period Score:
  - 0 Points for 50th Percentile Speed/Reference Speed > .67
  - 1 Point for 50th Percentile Speed/ Reference Speed >.33 and <.67
  - 2 Points for 50th Percentile Speed/Maximum Speed <.33
- PM Peak Period Score:
  - 0 Points for 50th Percentile Speed/ Reference Speed > .67
  - 1 Point for 50th Percentile Speed/ Reference Speed >.33 and <.67
  - 2 Points for 50th Percentile Speed/ Reference Speed <.33

The locations selected for congestion management projects were segments which scored 7 or 8 total points using this methodology. To avoid duplication with significant transportation investments committed to by the TPO, the CMP list eliminated congested locations which coincided with Miami-Dade 2045 LRTP Cost Feasible Plan (CFP) projects or with SMART Plan Corridors including the BERT network of routes since the observed congestion at these locations were assumed to be addressed by the CFP and Smart Plan investments.

LOCATIONS OF CONGESTED CORRIDORS

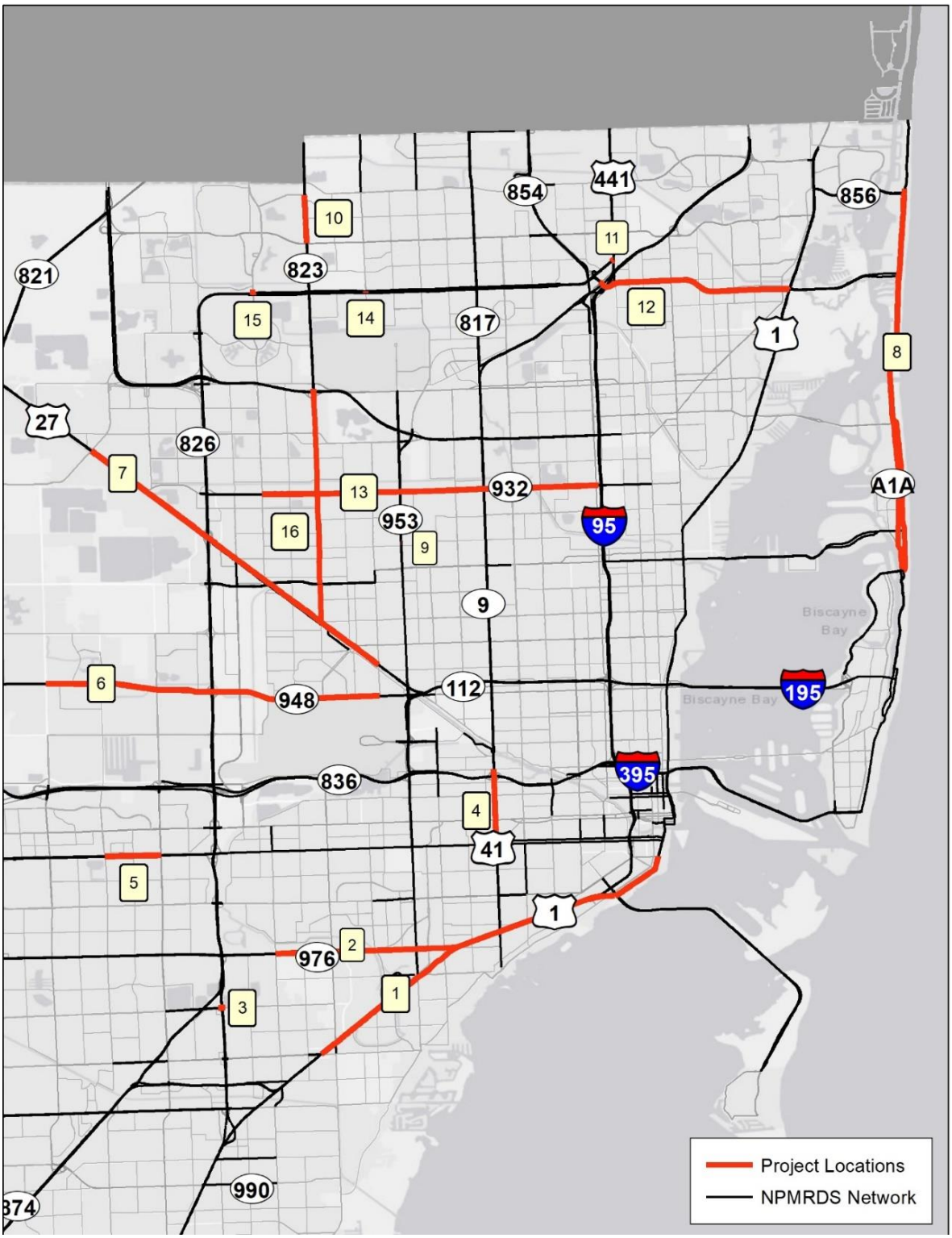
The final congested corridors identified through this process are listed in **Table 5** and shown in **Figure 4**. Specific projects and allocated funding sources are described in the following section.

TABLE 5 - IDENTIFIED CONGESTED CORRIDORS

ID	ROADWAY	FROM	TO
1	US 1	SW 72 St/Sunset Dr	SE 13 St
2	FL 976/SW 40 St/Bird Road	SW 67 Ave/Ludlam Rd	US 1
3	SW 56 St/Miller Drive	at FL 826/ Palmetto Expressway	
4	FL 9/NW 27 Ave	US 41/SW 8 St	NW 14 St
5	US 41/SW 8 St	SW 97 Ave	FL 973/SW 87 Ave
6	FL 948/NW 36 St/NW 41 St	NW 107 Ave	East Dr
7	US 27/Okeechobee Road	W Hialeah Gardens Blvd	SE 4 Ave
8	SR A1A	FL 907/W 63 St	FL 856/William Lehman Causeway/ NW 192 Ave
9	E 33 St	at FL 953/E 8 Ave/Le Jeune Rd	
10	FL 823/Red Road	FL 860/Miami Gardens Dr/NW 183 St	NW 199 St
11	NW 7th Ave Extension	at US 441	
12	FL 826/NE 167th St/ Miami Beach Blvd	I-95	US 1
13	FL 932/49 St	W 12 Ave/Ludlam Rd	US 441
14	FL 847/NW 47 Ave	at FL 826/ Palmetto Expressway	
15	NW 67 Ave/Flamingo Rd	at FL 826/ Palmetto Expressway	
16	FL 823/Red Road/W 4 Av/ NW 57 Ave	US 27/Okeechobee Road	FL 924/Gratigny Expressway

Source: Cambridge Systematics, Inc.

FIGURE 4 - MIAMI-DADE 2019 CONGESTION MANAGEMENT PLAN PROJECT LOCATIONS



Source: Cambridge Systematics.

CMP STRATEGIES

This section documents identification and implementation of CMP strategies. The CMP strategy toolbox developed as part of the 2014 CMP was reviewed and updated to reflect any new strategies identified since its completion. This toolbox was then utilized to identify strategies for the CMP corridors and hotspots recommended for CMP funding.

DEVELOPMENT OF CMP STRATEGY TOOLBOX

A wide range of congestion management strategies have been implemented in different areas across the nation. The development of the toolbox was based on a review of CMP strategy toolboxes developed by various metropolitan areas including the New York Metropolitan Transportation Council (NYMTC), Maryland Area Regional Commuter (MARC), Denver Regional Council of Governments (DRCOG), Maricopa Association of Governments (MAG), and Wasatch Front Regional Council (WFRC). The CMP toolbox was developed for the Miami-Dade TPO, considered these toolboxes but incorporated the region's demographics and congestion patterns. The toolbox is organized into five CMP categories as shown in **Figure 5**:

FIGURE 5 - CATEGORIES OF CONGESTION MANAGEMENT

ALTERNATIVES TO SINGLE OCCUPANT VEHICLE (SOV)	• Strategies that provide travelers with alternatives to encourage them to shift their mode from single occupant vehicles - transit is a major component
TRIP REDUCTION - TDM	• Strategies aimed at reducing the number and/or length of their trips - often broadly referred to as Travel Demand Management
ACTIVE TRANSPORTATION	• Pedestrian and bicycle investments to encourage people to change travel mode
TECHNOLOGY AND MANAGEMENT	• Deployment of intelligent transportation systems (ITS) technologies and transportation systems managment and operations (TSM&O) strategies to improve system operating efficiency
NEW ROAD CAPACITY	• Strategies to add roadway capacity

Each category includes a number of strategies with a focus on ITS and TSM, TDM, Land Use, Parking, Regulatory, Transit, Highway, Bicycle and Pedestrian, and Access Management. **Table 6** lists the five categories, number of CMP strategies included in each category, and an example of strategies within each category. The strategies under each category, their definition, benefits, general costs, and implementation timeframe are documented in **Appendix A**.

TABLE 6 - CMP STRATEGY TOOLBOX

MAJOR CATEGORY	NUMBER OF STRATEGIES	EXAMPLES
Single Occupant Vehicle Alternatives – Transit	14	New Fixed Guideway Transit; Bus Rapid Transit (BRT); Reducing Transit Fares
Trip Reduction – Travel Demand Management and Commuter Services	14	Employer Incentive Programs; Mixed-Use Development; Public Education Campaigns
Active Transportation	8	Bike Sharing Programs; Complete Streets; Pedestrian-Oriented Development
Intelligent Transportation Systems and Transportation System Management and Operations	24	Managed Lanes Congestion Pricing; Reversible Traffic Lanes; Work Zone Management
New Highway Capacity	9	New Freeways; New Arterial Streets; HOV Lanes

IDENTIFICATION OF CMP STRATEGIES

Based on a review of roadway conditions and the congestion pattern, a number of congestion mitigation strategies were identified for each congested facility. These strategies were based upon the overarching themes of the five categories of congestion management as shown previously in **Figure 5** in conjunction with the roadway characteristics. Specific characteristics include geometry (i.e. available right-of-way to add capacity), transportation systems (i.e. connectivity to existing transit systems), geography and urban density (i.e. density to support complete streets concepts). These congestion strategies are constrained by available funding which is documented in the next section. Estimated costs include capital expenses associated with the congestion mitigation strategies.

IMPLEMENTATION OF CMP STRATEGIES

Implementation of congestion mitigation strategies are constrained by available funds for congestion management in the region. The Miami-Dade TPO established a set aside to fund CMP projects as presented in **Table 7**.

TABLE 7 - CMP FUNDING FY 2025 – FY 2035 (IN MILLIONS OF DOLLARS, YOE)

	2025	2026 - 2030	2031 - 2035	TOTAL
2045 LRTP Congestion Management Set Aside	$9.59	$58.72	$63.95	$132.26

Based on funding availability in different time periods from 2020 to 2035, CMP projects were assigned to different Priorities. Note that for Priority I (2020 – 2025) funds are only identified for 2025. This is a result of the first five years of the Priorities overlapping with the Transportation Improvement Plan (TIP). In addition, there are no project set-asides for Priority IV – 2035 to 2045 – since CMP improvements are focused on short term solutions. **Table 8** documents the total CMP project needs and associated costs.

EVALUATION OF CMP STRATEGIES

Evaluation of CMP strategy effectiveness is an essential element of the CMP. The primary goal of the evaluation is to understand the effectiveness of implemented strategies at addressing congestion as intended, and to make changes based on the findings as necessary. Findings that show improvement in congested conditions due to specific implemented strategies can be used to encourage further implementation of these strategies, while negative findings may be useful for discouraging or downplaying the effectiveness of similar strategies in similar situations. CMP strategy evaluation can be either at the system level or at the project level. Traffic data before and after implementation of a strategy, should be collected in order to understand the real impact of a strategy. Therefore, strategy evaluation methodology should be determined before a strategy is implemented, and data collection should be conducted before implementation of a project.

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TABLE 8 -COST FEASIBLE CMP PROJECTS

PROJ	ROADWAY	FROM	TO	STRATE-GIES	SUMMARY DESCRIPTION	2025	2026-2030	2031-2035	TOTAL
1	US 1	SW 72 St/Sunset Dr	SE 13 St	4.6	Install Fiberoptic Communications for Traffic Surveillance and Control Systems	$5,500,000	$2,500,000		$8,000,000
2	FL 976/SW 40 St/ Bird Road	SW 67 Ave/Ludlam Rd	US 1	1.4	Bus Rapid Transit		$9,800,000		$9,800,000
3	SW 56 St/Miller Drive	at FL 826/ Palmetto Expressway		2.0 4.1 5.5	Travel Demand Management Traffic Signal Coordination and Modernization Highway Widening by Adding Lanes		$2,500,000		$2,500,000
4	FL 9/NW 27 Ave	US 41/SW 8 St	NW 14 St	4.1	Traffic Signal Coordination and Modernization	$1,500,000			$1,500,000
5	US 41/SW 8 St	SW 97 Ave	FL 973/ SW 87 Ave	2	Travel Demand Management	$300,000			$300,000
6	FL 948/NW 36 St/NW 41 St	NW 107 Ave	East Dr	1.5 1.8 2.0	Increasing Bus Route Coverage or Frequencies Local Circulator Expansion Travel Demand Management	$300,000	$2,100,000		$2,400,000
7	US 27/Okeechobee Road	W Hialeah Gardens Blvd	SE 4 Ave	2.0 4.1 5.5	Travel Demand Management Traffic Signal Coordination and Modernization Highway Widening by Adding Lanes	$300,000	$9,500,000		$9,800,000
8	SR A1A	FL 907/W 63 St	FL 856/William Lehman Causeway/ NW 192 Ave	3.1 3.5 3.6	Adopt and implement a Complete Streets Policy Improved Safety of Existing Bicycle and Pedestrian Facilities Promote Bicycle and Pedestrian Use	$1,450,000	$2,600,000		$4,050,000
9	E 33 St	at FL 953/E 8 Ave/ Le Jeune Rd		3.1 3.2 3.3 3.5	Adopt and implement a Complete Streets Policy New Sidewalks and Designated Bicycle Lanes on Local Streets Improved Bicycle Facilities at Transit Stations and Other Trip Destinations Improved Safety of Existing Bicycle and Pedestrian Facilities	$240,000	$720,000		$960,000
10	FL 823/Red Road	FL 860/Miami Gardens Dr/NW 183 St	NW 199 St	2.0 4.1	Travel Demand Management Traffic Signal Coordination and Modernization		$1,900,000		$1,900,000
11	NW 7th Ave Exten-sion	at US 441		1.5 2.0 4.1	Increasing Bus Route Coverage or Frequencies Travel Demand Management Traffic Signal Coordination and Modernization		$2,300,000		$2,300,000
12	FL 826/NE 167th St/ Miami Beach Blvd	I-95	US 1	1.4 1.8 2.0 3.2 3.3 3.5 3.6	Bus Rapid Transit Local Circulator Expansion Travel Demand Management New Sidewalks and Designated Bicycle Lanes on Local Streets Improved Bicycle Facilities at Transit Stations and Other Trip Destinations Improved Safety of Existing Bicycle and Pedestrian Facilities Promote Bicycle and Pedestrian Use		$6,600,000		$6,600,000
13	FL 932/49 St	W 12 Ave/Ludlam Rd	US 441	1.5 2.0 4.1	Increasing Bus Route Coverage or Frequencies Travel Demand Management Traffic Signal Coordination and Modernization		$6,600,000		$6,600,000

PROJ	ROADWAY	FROM	TO	STRATE-GIES	SUMMARY DESCRIPTION	2025	2026-2030	2031-2035	TOTAL
14	FL 847/NW 47 Ave	at FL 826/Palmetto Ex-pressway		5.5	Highway Widening by Adding Lanes		$2,500,000		$2,500,000
15	NW 67 Ave/Flamingo Rd	at FL 826/Palmetto Ex-pressway		5.5	Highway Widening by Adding Lanes		$2,500,000		$2,500,000
16	FL 823/Red Road/W 4 Av/ NW 57 Ave	US 27/Okeechobee Road	FL 924/ Gratigny Ex-pressway	1.5 2.0 4.1	Increasing Bus Route Coverage or Frequencies Travel Demand Management Traffic Signal Coordination and Modernization		$6,600,000		$6,600,000
17	Miami-Dade County	Network		1.0	Alternatives to Single Occupant Vehicle; Transit			$12,000,000	$12,000,000
18	Miami-Dade County	Network		2.0	Trip Reduction - TDM			$3,500,000	$3,500,000
19	Miami-Dade County	Network		3.0	Active Transportation			$7,000,000	$7,000,000
20	Miami-Dade County	Network		4.0	Technology and Management			$25,450,000	$25,450,000
21	Miami-Dade County	Network		5.0	New Road Capacity			$16,000,000	$16,000,000
					TOTAL	**$9,590,000**	**$58,720,000**	**$63,950,000**	**$132,260,000**

CMP STRATEGY TOOLBOX

APPENDIX A

(1) SINGLE OCCUPANT VEHICLE (SOV) ALTERNATIVE STRATEGIES – TRANSIT

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
1.1 New Fixed Guideway Transit	• More consistent and sometimes faster travel times for transit passengers versus driving	H	• Medium- to long-term
Exclusive guideways (e.g., light rail, heavy/commuter rail) and street guideways (e.g., 16th Street Mall, bus rapid transit (BRT)) devoted to increasing the person-carrying capacity within a travel corridor (see section 3.F. for information on HOV lanes)	• Increased person throughput capacity within a corridor due to people switching from single occupant motor vehicles to transit		Development and implementation of a rail project is a major undertaking that can take 10 or more years from initial planning phases through NEPA studies to an opening day.
	• Stimulation of efficient mixed-use or higher-density development		• On-street conversion of travel lanes to BRT may not take quite as long.
1.2 Implementing Rail Transit	• Reduce daily VMT	H	• Long-term: 10 or more years (includes planning, engineering, and construction)
This best serves dense urban centers where travelers can walk to their destinations. Rail transit from suburban areas can sometimes be enhanced by providing park- and- ride lots.	• More consistent and sometimes faster travel times versus driving		
	• Reduce SOV trips		
1.3 Dedicated Rights-of-Way for Transit	• Increase transit ridership	H	• Medium-term: 5 to 10 years (includes planning, engineering, and construction)
Reserved travel lanes or rights-of-way for transit operations, including use of shoulders during peak periods	• Decrease travel time		
1.4 Bus Rapid Transit (BRT)	• Reduce VMT	H	• Long-term: 10 or more years (includes planning, engineering, and construction)
High-capacity, highly efficient bus service designed to compete with rail in terms of quality of service.	• Reduce SOV trips		
	• Increase transit ridership & mode share		
1.5 Increasing Bus Route Coverage or Frequencies	• Increase transit ridership	H	• Short-term: 1 to 5 years (includes planning, engineering, and construction)
This provides better accessibility to transit to a greater share of the population. Increasing frequency makes transit more attractive to use. May require investment in new buses which would create a capital cost per passenger trip. May also include new routes or extensions to existing routes.	• Decrease travel time		
	• Reduce daily VMT		
	• Improved convenience and travel reliability		
	• Reduced traffic congestion due to trips switched from driving alone to transit		
1.6 Express Bus Service Expansion	• Reduce VMT	M	• Short-term: 1 to 5 years (includes planning, engineering, and construction)
Bus service with high-speed operations, usually between two commuter points.	• Reduce SOV trips		
	• Increase transit ridership & mode share		
1.7 Realigned Transit Service Schedules and Stop Locations	• Increase transit ridership	M	• Short-term: 1 to 5 years
Service adjustments to better align transit service with ridership markets	• Decrease daily VMT		
1.8 Local circulator expansion	• Reduce VMT	M	• Short-term: 1 to 5 years (includes planning, engineering, and construction)
Fixed-route service within an activity area, such as a CBD or campus, designed to reduce short trips by car.	• Reduce SOV trips		
	• Increase transit ridership & boardings		
1.9 Reducing Transit Fares	• Reduce daily VMT	M	• Short-term: Less than one year
This encourages additional transit use, to the extent that high fares are a real barrier to transit.	• Reduce congestion		
	• Increase ridership		
1.10 Electronic fare collection and Universal Farecards	• Improved service efficiency, passenger convenience and passenger loading time	M	• Short-term: 1 to 5 years
Interchangeable smartcard payment system (including RFID) that can be used as a fare payment method for multiple transit agencies throughout the region	• Increased ridership		
	• Acquisition of more accurate and comprehensive ridership and trip data		
	• Improved analysis and forecasting of trip ridership patterns and fare structure impacts		

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
	• Reduced overall operating cost of fare collection and processing		
	• Increased revenue through less fare evasion and greater accountability		
1.11 Intelligent Transit Stops	• Decrease daily VMT	M	• Medium-term: 5 to 10 years (includes planning, engineering, and construction
Ranges from kiosks, which show static transit schedules, to real-time information on schedules, locations of transit vehicles, arrival time of the vehicle, and alternative routes and modes	• Decrease congestion		
	• Increase ridership		
1.12 Improved Bicycle and Pedestrian Facilities at Transit Stations	• Increase bicycle mode share	L	• Short-term: 1 to 5 years (includes planning, engineering, and construction)
Includes improvements to facilities that provide access to transit stops as well as provisions for bicycles on transit vehicles and at transit stops (bicycle racks and lockers)	• Decrease motorized vehicle congestion on access routes		
1.13 Enhanced Transit Amenities	• Decrease daily VMT	L	• Short-term: 1 to 5 years (includes planning, engineering, and construction)
Includes vehicle replacement/upgrade, which furthers the benefits of increased transit use	• Decrease congestion		
	• Increase ridership		
1.14 Ridesharing - Carpool and Vanpool	• Reduce work VMT	M	• Employer-based
This is typically arranged/encouraged through employers or transportation management agencies, which provides ride-matching services. Programs to promote carpooling and vanpooling, including ridematching services and policies that give ridesharing vehicles priority in traffic and parking.	• Reduce SOV trips		• Short-term: 1 to 5 years
	• Lower commuting costs		
	• Reduce parking congestion		
	• Promote transit, biking and walking		

(2) TRIP REDUCTION STRATEGIES – TRAVEL DEMAND MANAGEMENT (TDM) AND COMMUTER SERVICES

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
EMPLOYEE-BASED STRATEGIES			
2.1 Alternative Work Hours	• Reduce peak-period VMT	L	• Employer-based
This allows workers to arrive and leave work outside of the traditional commute period. It can be on a scheduled basis or a true flex-time arrangement. Can also include a compressed work week.	• Improve travel time among participants		• Short-term: 1 to 5 years
	• Reduction in SOV trips (maybe modify with "during peak")		
2.2 Telecommuting	• Reduce VMT	L	• Employer-based
This involves employees to work at home or regional telecommute center instead of going into the office. They might do this all the time, or only one or more days per week. Also include teleconferencing and videoconferencing.	• Reduce SOV trips		• Short-term: 1 to 5 years
	• Fewer drivers during morning and afternoon rush hours.		
	• Increased employee productivity, improved employee retention and recruitment, reduced overhead costs and lower demand for physical office and parking space		
	• Decreased commuting time and expenses for employees		
2.3 Employer Incentive Programs	• Increase transit ridership	M	• Short-term: 1 to 5 years
Encourages additional transit use through transit subsidies of mass transit fares provided by employers	• Decrease travel time		
	• Decrease daily VMT		
COMMUNITY DESIGN, LAND USE, POLICY & REGULATORY STRATEGIES			
2.4 Efficient land use and development practices	• Less motor vehicle use through greater bicycling, walking and transit use	M	Short- to long-term
• Areawide policies and strategies that result in a more transportation-efficient regional development pattern (e.g., urban growth boundary)	• Related health benefits and economic savings via less infrastructure needs		• Small-scale retrofit practices, re-zonings or comprehensive plan amendments can be done in a short to moderate timeframe. Regional-scale policy changes may take a long time to adopt and result in development changes on the ground and integration with transportation systems.
	• Reduce VMT		
• Localized planning, zoning, ordinances and site approval strategies that result in more transportation-efficient developments (e.g., mixed-land-uses, higher density, urban centers, well connected transit, pedestrian and bicycling facilities)	• Reduce SOV trips		
	• Increase alternative modes share		
2.5 Transit-Oriented Development	• Decrease SOV share	NA	• Long-term: 10 or more years
This clusters housing units and/or businesses near transit stations in walkable communities.	• Shift carpool to transit		
	• Increase transit trips		
	• Decrease VMT		
	• Decrease in vehicle trips		
	• Increase transit mode share		
2.6 Mixed-Use Development	• Increase walk trips	L	• Long-term: 10 or more years
This allows many trips to be made without automobiles. People can walk to restaurants and services rather than use their vehicles	• Decrease SOV trips		
	• Decrease in VMT		
	• Decrease vehicle hours of travel		
2.7 Infill and Densification	• Decrease SOV	L	• Long-term: 10 or more years
This takes advantage of infrastructure that already exists, rather than building new infrastructure on the fringes of the urban area.	• Increase transit, walk, and bicycle		
	• Doubling density decreases VMT per household		
	• Medium/high vehicle trip reductions		
	• Air quality benefit to densification		

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
2.8 Public Education Campaigns	• Air Quality Benefit Medium	L	• Immediate
E.g., driving habits, trip chaining, idle reduction, jackrabbit starts, Clean the Air Challenge	• Positive user impacts		
2.9 Guaranteed Ride Home Policies	• Decrease work VMT	H	• Employer-based
Provides a guaranteed ride home at no cost to the employee in the event an employee or a member of their immediate family becomes ill or injured, requiring the employee to leave work	• Decrease SOV trips		• Short-term: 1 to 5 years
2.10 Alternative travel mode events and assistance	• Fewer single-occupant vehicles on the road and less overall traffic congestion	L	• Short-term
• Variety of events that promote, encourage and educate people about alternative travel modes (e.g., Bike to Work Day, RideSmart Thursdays and employer transportation fairs)	• Lower commuting costs		
• Programs that provide free or low-cost transit services (e.g., EcoPass) or other incentives			
2.11 Transportation Management Associations	• Reduce VMT	NA	• Employer-based
Nonprofit, member-controlled organizations that provide transportation services in a particular area, such as a commercial district, mall, medical center, or industrial park. They are generally public-private partnerships consisting primarily of area businesses with local government support.	• Reduce SOV trips		• Short-term: 1 to 5 years
	• Increase alternative modes share		
	• Increase transit mode share		
2.12 Trip Reduction Ordinance	• Improve air quality	L	• Medium-term: 5 to 10 years
Draws commuters to use other ways to travel to work besides driving alone. Requires employers to promote commute alternatives.	• Decrease traffic congestion		
	• Minimize energy consumption		
2.13 Auto Restriction Zones (Pedestrian Malls)	• Increase capacity	M	• Medium-term: 5 to 10 years
Allows for a more equitable community, where all residents have an equal access to services within the area. Provides commercial access for pedestrians and non-car users. The most common form of an auto-restriction zone (pedestrian zones) in large cities is the pedestrian mall. Pedestrian malls generally consist of a storefront-lined street that is closed off to most automobile traffic.	• Decrease travel times		
	• Increase safety		
	• Improve bicycle and pedestrian-friendly roadways		
2.14 Truck Restrictions – time or location	• Increase capacity	M	• Medium-term: 5 to 10 years
Aims to separate trucks from passenger vehicles and pedestrians. Prohibits trucks from traveling on certain roadways and may call for weight restrictions on certain bridges.	• Decrease travel times		
	• Increase safety		
	• Improve bicycle and pedestrian-friendly roadways		

(3) ACTIVE TRANSPORTATION STRATEGIES

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
3.1 Adopt and implement a Complete Streets policy	• Increase safety by improving the overall (pedestrian and bicycle) transportation system environment	NA	• Near term (1-2 years)
Policy that takes into account all users of streets rather than just autos, with a goal of completing the streets with adequate facilities for all users. A "Complete Street" is one designed and operated to enable safe access for all users including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities.	• Reduce congestion in corridors and systems		
	• Provide cost savings by reducing longer distance travel, increasing shorter distance travel, and use by non-motorized modes		
	• Provide travel time savings to users of the system		
	• Increase access to and use of alternative modes		
	• Protect natural environment through sound land use and transportation sustainability policies		
	• Increase community involvement and activity in developing policy and promoting projects		
	• Promote incentive to use transit, bike, or walk		
3.2 New Sidewalks and Designated Bicycle Lanes on Local Streets.	• Increase mobility and access	L	• Short-term: 1 to 5 years (includes planning, engineering, and construction)
Enhancing the visibility of bicycle and pedestrian facilities increases the perception of safety. In many cases, bike lanes can be added to existing roadways through restriping. Use of bicycling and walking is often discouraged by a fragmentary, incomplete network of sidewalks and shared use facilities.	• Increase nonmotorized mode shares		
	• Separate slow moving bicycles from motorized vehicles		
	• Reduce incidents		
3.3 Improved Bicycle Facilities at Transit Stations and Other Trip Destinations.	• Increase bicycle mode share	L	• Short-term: 1 to 5 years (includes planning, engineering, and construction)
Bicycle racks and bike lockers at transit stations and other trip destinations increase security. Additional amenities such as locker rooms with showers at workplaces provide further incentives for using bicycles.	• Reduce motorized vehicle congestion on access routes		
3.4 Design Guidelines for Pedestrian-Oriented Development	• Increase pedestrian mode share	L	• Short-term: 1 to 5 years
Maximum block lengths, building setback restrictions, and streetscape enhancements are examples of design guidelines that can be codified in zoning ordinances to encourage pedestrian activity.	• Discourage motor vehicle use for short trips		
	• Reduce VMT, emissions		
3.5 Improved Safety of Existing Bicycle and Pedestrian Facilities.	• Increase nonmotorized mode share	L	• Short-term: 1 to 5 years
Maintaining lighting, signage, striping, traffic control devices, and pavement quality, and installing curb cuts, curb extensions, median refuges, and raised crosswalks can increase bicycle and pedestrian safety.	• Reduce incidents		
	• Increase monitoring and maintenance costs		
3.6 Promote Bicycle and Pedestrian Use Through Education and Information Dissemination	• Shift trips into non-SOV modes such as walking, bicycling, transit	L	• Short-term: 1 to 5 years
Bicycle and pedestrian use can be promoted through educational programs and through distribution of maps of bicycle facility/multi-use path maps.	• Increase bicycle/pedestrian mode share		
3.7 Exclusive Non-Motorized Rights-of-Way.	• Increase mobility	M	• Medium-term: 5 to 10 years (includes planning, engineering, and construction)
Abandoned rail rights-of-way and existing parkland can be used for medium- to long distance bike trails, improving safety and reducing travel times.	• Increase nonmotorized mode shares		
	• Reduce congestion on nearby roads		
	• Separate slow-moving bicycles from motorized vehicles		
	• Reduce incidents		
3.8 Bike Sharing Programs	· Increase non-motorized mode share	L	• Short-term: 1 to 5 years
Short-term bicycle rental program supported by a network of automated rental stations	· Discourage motor vehicle use for short trips		
	· Decrease VMT		

(4) INTELLIGENT TRANSPORTATION SYSTEMS (ITS) AND TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS (TSM&O) STRATEGIES

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
4.1 Traffic Signal Coordination and Modernization	• Improve travel time	L	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
This strategy improves traffic flow and reduces emissions by minimizing stops on arterial streets. Enhancements to timing/coordination plans and equipment to improve traffic flow and decrease the number of vehicle stops. May include:	• Reduce the number of stops		
• Modern technology that provides for real-time traffic and transit management	• Reduce VMT by vehicle miles per day, depending on program		
• Equipment that may permit immediate knowledge of malfunctions	• Reduce VHD and PHT		
• Responsive control that allows traffic signals to alter timing in response to immediate traffic flow conditions, rather than at predetermined times	• Reduced air pollution, fuel consumption and travel time		
• Transit signal priority system that can extend "green-time" a few seconds to allow buses to progress through an intersection	• Increase "capacity" of an intersection to handle vehicles, reduced number of vehicle strategies		
4.2 Managed Lanes Congestion Pricing	• Decrease VMT	M	• Medium-term: 5 to 10 years
• HOT Lanes – High Occupancy Vehicle (HOV) toll lanes that allow a limited number of low-occupancy vehicles to use the lane if a fee is paid. Typically, free for HOVs	• Increase transit and nonmotorized mode shares		
Controls peak-period use of transportation facilities by charging more for peak-period use than for off-peak. Congestion pricing fees are charged to drivers using congested roadways during specific times of the day. This strategy is evaluated in order to maintain a specific level of service on a given road or all roads (areawide systems) in a region. For example, an average fee of $0.65 cents/mile could be applied to 29 percent of urban and 71 percent of rural vehicle miles traveled (VMT) to better manage travel demand and the resulting congestion for a roadway			
4.3 Reversible Traffic Lanes	• Increase peak direction capacity	H	• Short-term: 1 to 5 years
These are appropriate where traffic flow is highly directional.	• Reduce peak travel times		
	• Improve mobility		
4.4 Cordon area congestion fees	• Reduced pollution and congestion within the cordon area	H	Medium- to long-term
An established cordon area or zone in which vehicles are charged a fee to enter. Such a fee can be variable (by time of day) or dynamic (based on real-time congestion conditions). Should include electronic payment/collection methods using cameras or transponders	• Revenues for roadway maintenance and new transit, bicycle and pedestrian facilities		• Extensive time is required for the entire process including political and public discussions, possible ballot measures, construction and implementation
	• Overall reduced congestion due to less VMT		
	• Provide incentive to use transit, bike, or walk		
4.5 Ramp Metering	• Decrease travel time	L	• Medium-term: 5 to 10 years
This allows freeways to operate at their optimal flow rates, thereby speeding travel and reducing collisions. May include bus or high-occupancy vehicle bypass lanes. May require ramp widening to avoid extensive vehicle queuing.	• Decrease accidents		
	• Improve traffic flow on major facilities		
	• Improved speed on freeway		
	• Decreased crash rate on freeway		
4.6 Traffic Surveillance and Control Systems	• Decrease travel times and delay	M	• Medium-term: 5 to 10 years
Often housed within a Traffic Management Center (TMC), monitors volume and flow of traffic by a system of sensors, and further analyzes traffic conditions to flag developing problems, and implement adjustments to traffic signal timing sequences, in order to optimize traffic flow estimating traffic parameters in real-time. Relies on base infrastructure (fiber, cameras, etc.) required to support all operational activities and communication networks that allow remote roadway surveillance and system control from a TMC and provision of data for immediate management of transportation operations and distribution of information	• Some peak-period travel and mode shift		• Small-scale items and opportunistic expansion can be done quickly. Larger-scale regional network components require more time for planning and funding
	• Increased capability for regional-level coordination of operations and traveler information		

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
4.7 Freeway Incident Detection and Management Systems	• Reduce accident delay	M	• Medium- to Long-term: likely 10 years or more
This is an effective way to alleviate non-recurring congestion. Systems typically include video monitoring, dispatch systems, and sometimes roving service patrol vehicles.	• Reduce travel time		
	• Decrease VHT and PHT		
4.8 Advanced Traveler Information Systems	• Reduce travel times and delay	L	• Medium-term: 5 to 10 years
This provides an extensive amount of data to travelers, such as real time speed estimates on the web or over wireless devices, and transit vehicle schedule progress. Provides travelers with real-time information that can be used to make trip and route choice decisions. Information accessible on the web, dynamic message signs, 511 systems, Highway Advisory Radio (HAR), or handheld wireless devices.	• Some peak-period travel and mode shift		
4.9 Targeted and Sustained Enforcement of Traffic Regulations	• Improve travel time	L	• Short-term: 1 to 5 years
Improves traffic flow by reducing violations that cause delays; Includes automated enforcement (e.g., red light cameras)	• Decrease the number of stops		
4.10 Service Patrols	• Reduce incident duration time	M	• Short-term: 1 to 5 years
Service vehicles patrol heavily traveled segments and congested sections of the freeways that are prone to incidents to provide faster and anticipatory responses to traffic incidents and disabled vehicles	• Restore full freeway capacity		
	• Reduce the risks of secondary accidents to motorists		
4.11 Work Zone Management	• Minimize traffic delays	L	• Short-term: 1 to 5 years
Includes a suite of strategies including temporary traffic control, public awareness and motorist information, and traffic operations	• Improve mobility		
	• Maintain access for businesses and residents		
4.12 Road Weather Management	• Improve safety due to reduced crash risk	L	• Short-term: 1 to 5 years
Identifying weather and road surface problems and rapidly targeting responses including advisory information, control measures, and treatment strategies	• Increased mobility due to restored capacity, delay reductions, and more uniform traffic flow		
4.13 Roadway Signage Improvements	• Reduced level of driver uncertainty and fewer erratic driving maneuvers	L	Short-term
Adequate or additional signage that facilitates route-finding and the decision-making ability of roadway users. Signs with clearer/larger lettering that can be read from a greater distance	• Reduced delay for upstream approaching vehicles		• Production of signs and installation can occur shortly after site visits and design of new signing plans. Design should follow the guidance of the Manual on Uniform Traffic Control Devices (MUTCD).
	• Psychological encouragement to unsure motorists		
	• Less chance of crashes caused by sudden lane changes, extremely slow-moving vehicles or sudden		
	stops		
4.14 Dynamic Speed Control	• Air Quality Benefit Medium	L	• 1-2 years
"Go Slow, Go Fast"	• Positive user impacts		
4.15 Converting Streets to One-Way Operations	• Increase traffic flow	M	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
Establishes pairs of one-way streets in place of two-way operations. Most effective in downtown or very heavily congested areas			
4.16 Electronic toll collection (ETC)	• Fewer vehicle stops and less traveler delay at toll stations	M	Short- to medium-term:
Equipment that electronically collects tolls from users without requiring vehicles to stop at a toll booth	• Cost savings due to no (or fewer) toll booth facilities or lanes		• Physical implementation of electronic toll collection equipment can be completed in a short time period for a roadway, unless additional right-of-way is needed.
	• Significant decrease in pollutant emissions from stop-and-go traffic at toll booths/plazas		
4.17 Transit vehicle travel information	• More satisfied customers and increased ridership due to enhanced and reliable information sources	M	Medium
Communications infrastructure, GPS technology, vehicle detection/monitoring devices and signs/media/Internet sites for providing information to the public such as the arrival times of the next vehicles	• Improved operations and management of transit service		• Time is required for detailed planning, design and funding procurement
4.18 Transit signal priority and intersection queue jump lanes	• Reduced bus travel delays due to traffic signals and traffic congestion	M	Short-term: 1 to 5 years

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
• Additional travel lane at a signalized intersection that allows buses to proceed via their own "green-time" before other vehicles	• Reduced bus travel delays due to traffic signals and traffic congestion		• All phases–planning, engineering and implementing–a queue-jump lane can be reasonably completed in less than one year.
	• Improved operational efficiency of transit service within a corridor		
• Done by restriping within existing road footprint or this may require construction	• Increased ridership and reduced congestion due to time savings		• Longer time is needed if new lane must be constructed
	• Safer driving conditions for all vehicles due to fewer severe and sudden lane changes by buses		
	• Increased ridership and reduced congestion due to time savings		
	• Safer driving conditions for all vehicles due to fewer severe and sudden lane changes by buses		
ACCESS MANAGEMENT STRATEGIES			
4.19 Left Turn Restrictions; Curb Cut and Driveway Restrictions	• Increased capacity, efficiency on arterials	L	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
Turning vehicles can impede traffic flow and are more likely to be involved in crashes.	• Improved mobility on facility		
	• Improved travel times and reduced delay for through traffic		
	• Fewer incidents		
4.20 Turn lanes and New or Relocated Driveways and Exit Ramps	• Increased capacity, efficiency	M	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
In some situations, increasing or modifying access to a property can be more beneficial than reducing access.	• Improved mobility and safety on facility		
	• Improved travel times and reduced delay for all traffic		
4.21 Interchange Modifications	• Increased capacity, efficiency	M	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
Conversion of a full cloverleaf interchange to a partial cloverleaf, for example, reduces weaving sections on a freeway.	• Improved mobility on facility		
	• Improved travel times and reduced delay for through traffic		
	• Fewer incidents due to fewer conflict points		
4.22 Roadway Restrictions	• Increase capacity, efficiency on arterials	M	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
Closes access during rush hours (AM and PM peak hours) and aids in the increase of safety levels through the prevention of accidents at problem intersections. This measure may be effective along mainline segments of a highway, which operate at poor service levels.	• Improve mobility on facility		
	• Improve travel times and decrease delay for through traffic		
	• Decrease incidents		
4.23 Access Control to Available Development Sites	• Increase capacity, efficiency on arterials	M	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
Coordination of access points to available development sites allows for less interference in traffic flow during construction and/or operation of new developments	• Improve mobility on facility		
	• Improve travel times and decrease delay for through traffic		
	• Decrease incidents		
4.24 Roundabout intersections	• Greater capacity than traditional 3- or 4-way intersections in many situations	M	• Medium-term
An intersection modification that does not use traffic signal or stop sign controls. Provides continuous movement via entrance and exit lanes to/from a typically circular distribution roadway	• Fewer crashes over time		Completion time for a replacement roundabout is related to the amount of planning and public outreach time needed and the right-of-way acquisition process
	• Lower air pollutant emissions due to fewer stopped vehicles		
4.25 Frontage Roads and Collector-Distributor Roads	• Increased capacity, efficiency	H	• Medium-term: 5 to 10 years (includes planning, engineering, and implementation)
Frontage roads can be used to direct local traffic to major intersections on both super arterials and freeways. Collector-distributor roads are used to separate exiting, merging, and weaving traffic from through traffic at closely spaced interchanges.	• Improved mobility on facility		
	• Improved travel times and reduced delay for through traffic		
	• Fewer incidents due to fewer conflict points		

(5) NEW HIGHWAY CAPACITY STRATEGIES

STRATEGIES/PROJECTS	CONGESTION AND MOBILITY BENEFITS	COSTS	IMPLEMENTATION TIMEFRAME
5.1 Increasing Number of lanes without highway widening	• Increase capacity	M	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
This takes advantage of "excess" width in the highway cross section used for break-down lanes or median.			
5.2 Geometric Design Improvements	• Increase mobility	M	• Short-term: 1 to 5 years (includes planning, engineering, and implementation)
This includes widening to provide shoulders, additional turn lanes at intersections, improved sight lines, auxiliary lanes to improve merging and diverging.	• Reduce congestion by improving bottlenecks		
Interchange modifications to decrease weaving sections on a freeway, paved shoulders and realignment of intersecting streets. Consider revising to discuss added segment capacity and added intersection capacity	• Increase traffic flow and improve safety		
	• Decrease incidents due to fewer conflict points		
5.3 Super Street Arterials	• Increase capacity	M	• Medium-term: 5 to 10 years (includes planning, engineering, and implementation)
This involves converting existing major arterials with signalized intersections into "super streets" that feature grade-separated intersections.	• Improve mobility		
5.4 Acceleration/Deceleration lanes	• Slower-moving turning or exiting vehicles are removed from through lanes resulting in fewer delays for upstream traffic	M	• Medium-term
• Deceleration lane provided on a freeway just before an exit off-ramp allowing vehicles to reduce speed outside the through-lanes	• Accelerating vehicles are provided more distance to reach the speed of through traffic, resulting in fewer delays caused by merging and weaving vehicles		Right-of-way is an important factor in the time required for implementation and construction.
• Acceleration lane provided as an extension of a freeway on-ramp or an arterial street turn-lane for vehicles to increase speed and merge more smoothly into the through-lane	• In certain situations, can greatly reduce delays (caused by braking) for upstream vehicles during peak traffic flow periods		
5.5 Highway Widening by Adding Lanes	• Increase capacity, reducing congestion in the short term	H	• Long-term: 10 or more years (includes planning, engineering, and construction)
This is the traditional way to deal with congestion.	• Long-term effects on congestion depend on local conditions		
	• Reduced traffic and congestion on parallel streets		
5.6 HOV Lanes	• Reduce Regional VMT	H	• Medium-term: 5 to 10 years (includes planning, engineering, and construction)
This increases corridor capacity while at the same time provides an incentive for single-occupant drivers to shift to ridesharing. These lanes are most effective as part of a comprehensive effort to encourage HOVs, including publicity, outreach, park-and-ride lots, and rideshare matching services.	• Reduce regional trips		
	• Increase vehicle occupancy		
	• Improve travel times		
	• Increase transit use and improve bus travel times		
5.7 Grade separated railroad crossings	• Significant reduction in travel delays at high volume locations	H	• Medium- to long-term
Roadway underpass or overpass of a railroad line	• Likely elimination of car-train crashes		Implementation requires significant negotiation with railroads and local communities
	• Decreased noise from train horns/whistles		
5.8 New Freeways	• Reduce arterial street network congestion	H	• Long-term: 10 or more years (includes planning, engineering, and construction)
Construction of new, access-controlled, high-capacity roadways in areas previously not served by freeways.	• Reduce travel times & delay		
5.9 New Arterial Streets	• Provide connectivity	H	• Medium-term: 5 to 10 years (includes planning, engineering, and construction
Construction of new, higher-capacity roads designed to carry large volumes of traffic between areas in urban settings.	• Carry traffic from local & collector streets to other areas		

Miami-Dade Transportation Planning Organization

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