Metropolitan Planning Organization
DADE COUNTY

Mobility Management Process/ Congestion Management System

Transportation Improvement Program

Long Range Plan

EXECUTIVE SUMMARY

dpa

Metropolitan Planning Organization

DADE COUNTY

MOBILITY MANAGEMENT PROCESS /CONGESTION MANAGEMENT SYSTEM

(DCMMP/CMS)

EXECUTIVE SUMMARY

PREPARED FOR
Dade County Metropolitan Planning Organization
111 NW First Street, Suite 910
Miami, FL 33128

PREPARED BY
David Plummer & Associates, Inc.
1750 Ponce de Leon Boulevard
Coral Gables, FL 33134

dpa

MPO METRO-DADE
Metropolitan Planning Organization

The Metropolitan Planning Organization (MPO) of Dade County developed a Congestion Management System (CMS) as required by the Federal regulations, under 23 CFR Part 500 Subpart E.

In Dade County, the most populated county in the State of Florida, the CMS was designed to address ***mobility*** rather than congestion through a defined process. The process follows guidelines established by the Statewide Task Force which serves as a forum for congestion mitigation. Therefore, consistent with the Florida Department of Transportation (FDOT), in Dade County, this process is known as the Mobility Management Process (DCMMP/CMS).

- A focus toward mobility rather than congestion.
- The inclusion of the state and county roadway system, as well as transit networks in the transportation network.
- The establishment of a Relative Congestion Ratio (RCR), a combination of the two different roadway level of service (LOS) standards used by the FDOT and Dade County.
- Areawide or corridor-specific measurable objectives can be established based on the RCR method.
- The use of *mobility* as a determining factor in selecting strategies for evaluating congested corridors.

"The Congestion Management System (CMS) 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" **23 CFR 500.503**

GOALS

The four DCMMP/CMS goals are:

- To improve the mobility of people and goods within and throughout the county.
- To improve the efficiency of the transportation system.
- To become an integral component of the land use and transportation planning process.
- To comply with Intermodal Surface Transportation Efficiency Act (ISTEA) and the FDOT requirements for the CMS.

Each goal has a corresponding set of objectives to ensure compliance.

HIGHLIGHTS

Aside from prioritizing congested corridors in accordance with the 15 planning factors set forth in Section 450.316 of the CFR, Dade County has introduced several innovative elements such as:

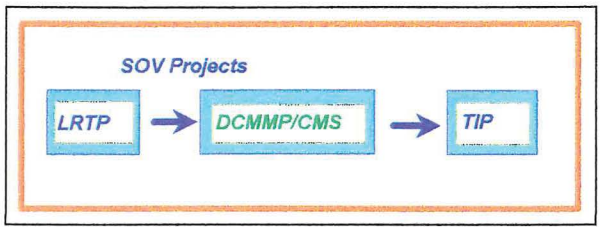
THE DCMMP/CMS PROCESS

The DCMMP/CMS will be integral to the land use and transportation planning process. It will focus on increasing transportation system efficiency in a cost effective manner. In that regard, the DCMMP/CMS will discourage those projects such as widening roads that promote the use of single occupant vehicles (SOV) on Dade County's roadways. Figure 1 shows the procedure used to develop the DCMMP/CMS.

The primary purpose of the DCMMP is to evaluate transportation alternatives along congested corridors before adding highway lanes or implementing any project that may increase the physical capacity of a roadway.

Alternatives or strategies are oriented to manage or alleviate, rather than to eliminate congestion.

Essentially, SOV projects from the Long Range Transportation Plan (LRTP) will be evaluated based on DCMMP/CMS process criteria. Only then will SOV projects be incorporated into the Transportation Improvement Plan (TIP).



In order to incorporate the DCMMP/CMS into the transportation planning process, it is recommended that the Transportation Planning Council (TPC) and the MPO Governing Board approve a resolution amending the existing process. The resolution will require evaluation of projects widening roadways in an effort to determine alternate strategies to alleviate traffic congestion and improve mobility.

COMPONENTS OF DCMMP/CMS

Federal regulations require a minimum of four components in the development of a CMS. Dade County has addressed these components through 8 specific categories:

1. Transportation Network

After detailed evaluation and discussion, the highway network that will be used in the Dade County DCMMP/CMS will be similar to the one defined by the Travel Demand Model. The transportation network will include the two main components of the CMS: highway and transit elements. That is, state and county roadway facilities, as well as the transit system.

2. Performance Measures

Highways

Dade County uses LOS as the highway performance measure. Due to concurrency requirements, the state and county have different methods of determining LOS. Hence the need for RCR - the Relative Congestion Ratio. The RCR provides a methodology to measure the level of congestion considering both the Comprehensive Plan and the Florida Intrastate Highway System (FIHS) requirements.

$$RCR = \frac{\text{Existing V/C Ratio}}{\text{Maximum V/C Ratio Allowed}}$$

The value used for *Maximum V/C Ratio Allowed* is typically the one established either in the Dade County Comprehensive Development Master Plan (CDMP) or the Florida Intrastate Highway System (FIHS) Standards, as appropriate.

Based on the use of RCR as a measure of highway system performance, three categories were established to describe the severity of traffic conditions relative to the standards in Dade County.

These were:

Nearly Congested	$0.9 < RCR <= 1.00$
Moderately Congested	$1.0 < RCR <= 1.20$
Highly Congested	$RCR > 1.20$

Transit

Dade County uses one of three measures for transit performance:

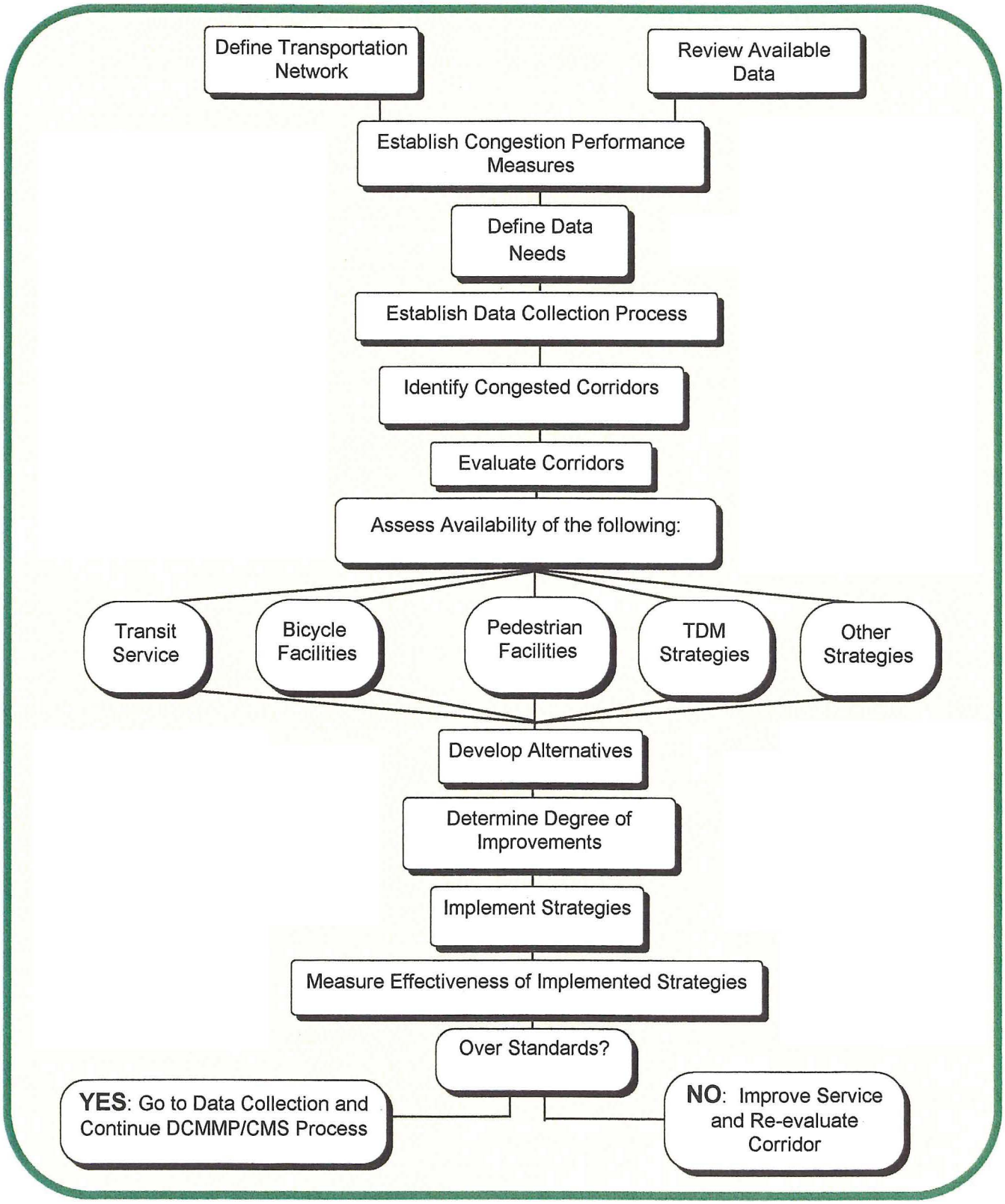
1. Load Factor (% seats filled)
2. Travel Time
3. Travel Speed

Non Traditional Modes

To accommodate bicycle users and pedestrians better, Dade County has adopted the Statewide Task Force recommendation that is based on the availability of bicycle and pedestrian facilities along congested corridors.

The physical condition of bicycle facilities can be evaluated by using the Roadway Condition Index (RCI) method as outlined in the approved Metro Dade Bicycle Facilities Plan. This method is based on a formula that assigns a numerical value to each facility representing one of five categories ranging from *Suitable* to *Hazardous* roadway conditions.

Figure 1
DADE COUNTY MOBILITY MANAGEMENT PROCESS



3. Mobility Strategies

Initially, over 150 strategies were considered for the DCMMP/CMS. Dade county adopted 63 of the original set of alternatives and further grouped them by types of action. The breakdown of strategies is shown in the following table.

Because of the unique characteristics of each corridor, a periodic evaluation is necessary to determine which strategies should be implemented to alleviate congestion and improve mobility within the area.

STRATEGIES	
Type	**No.**
Travel Demand Managment (TDM)	15
Transportation System Management (TSM)	8
High Occupancy Vehicle (HOV) lanes	2
Public Transit Capital Improvements	6
Public Transit Operational Improvements	7
Bicycle and Pedestrian Facilities	9
Congestion Pricing	3
Growth Management	3
Access Management	1
Intelligent Transportation System (ITS) Technology	5
General Purpose lanes	2
Other Strategies	2
TOTAL	**63**

4. Corridor Evaluation and Ranking

To evaluate the congested corridors efficiently, additional data collection will be made part of this step. In addition to the technical aspects involved in this process, other factors such as: project cost, improvements in mobility, connectivity and accessibility, as well as air quality and social benefits, will be considered to provide a comprehensive evaluation of the congested corridors.

Subsequent to evaluation, each corridor will be assigned a value (between 1 and 5) based on its compliance with each of the regulation's fifteen planning factors. The values one (1) and five (5) indicate respectively the corridors that are lease compliant with the requirements.

Criteria to determine the value for each factor were set. Based on the rating scale used, the corridor with the lowest score was assigned #1 priority and the next lowest scored corridor as #2 and so on.

5. Strategy Evaluation and Ranking

According to the Florida Statewide Mobility Management Process Task Force, ***MOBILITY*** is defined as *'the ability of people to complete desired trips'.* This concept has been adopted by DCMMP/CMS and is used to rank strategies based on the six factors described below:

People Movement

This factor refers to the ability of a particular strategy to improve people mobility, where certain strategies are more effective in some corridors than in others.

Modal Choice

People must have the opportunity to select the best available mode to complete the desired trip, under their particular circumstances. This factor considers the availability of options: walk, bike, personal car, public transit (rail, bus, jitney or taxi), carpool, vanpool or any other alternative such as telecommuting (home-based work) to complete his/her trip. Strategies should therefore be rated according to the corridor's ability to provide access to other modes.

Accessibility

People must have ease of access to satisfy travel objectives. For this purpose, accessibility means the number of paths that a person can take to complete a trip from "A" to "B" regardless of time. Each strategy should be evaluated according to its relative connectivity to other corridors.

Reasonable Speed

Defined as the speed with which one can travel by private car relative to the travel speed of other modes. Strategies should be evaluated to increase the speed along a given corridor.

	PLANNING CRITERIA	COMMENTS	
		Lowest Value (1)	Highest Value (5)
1	Efficient use of existing transportation facilities	No existing transportation facilities nearby	Strategies will maximize corridor efficiency
2	Consistency with energy conservation programs	No strategies related to conservation programs	Strategies will include energy efficient alternatives
3	Relieve/prevent congestion	No actions taken to relieve congestion	Projects implemented to relieve congestion
3a	Mobility of people and goods	RCR Ratio greater than 1.2	RCR Ratio lower than 0.9
3b	TDM and operational strategies	No strategies in place	More than 3 strategies in place
4	Balancing transp. and land use	Promotes segregation of land use	Promotes integration of land use
5	Programming of transportation enhancement facilities	No enhancement projects in program	Programming of enhancement expenditures are included in the TIP
6	Project cost effectiveness	Small benefits in projects implemented	Large benefits obtained in projects implemented along the corridor
7	Intermodal facilities	No intermodal facilities nearby	Existing or future intermodal facilities are nearby
8	Connectivity between areas	Corridor does not connect important locations	Corridor serves as a connector for several important locations
9	Relation to LRTP and TIP	Not considered in the LRTP nor the TIP	Evaluated in the LRTP and the TIP
10	Preservation of ROW	No ROW available for future projects or expansions	ROW available for future projects
11	Efficient movement of freight	Not used for freight movement	Used heavily for freight movement
12	Use of life-cycle costs	No cost analysis	Life Cycle Cost analysis used in project evaluation
13	Overall social, economic, energy and environmental effects	Urgently needs projects to improve social, economic, energy or environmental impacts	No social, economic, energy or environmental impacts affect the corridor
14	Increased use of transit services	No transit service available	Transit services available
15	Capital investment	High investment in developing projects	Low investment in developing projects

Moderate Cost

Availability of funds is an important factor when considering strategy implementation. This element evaluates capital, operating, maintenance and out-of-pocket costs necessary to develop, implement and use the selected strategies.

Ease of Implementation

Basically, the *Satisfy Trip Objective* that was included in the Florida Statewide Mobility Management Process will be substituted by this element. It will evaluate other elements (except costs), that should be considered, such as social and environmental impacts, as well as time needed to implement each strategy.

The elements will then be evaluated for each strategy using a 5-point scale, where 5 is most preferred. As an example, the resulting 'score' will indicate how a particular strategy compares regarding say extent of environmental impacts.

6. Determination of Improvements

This step provides the opportunity to determine the degree of improvement required for each corridor which could be done by either establishing RCR reduction goal or by determining each corridor's priorities. These needs could include qualitative factors that may require special attention. Among them are: social and economic impacts to the community, efficient use of existing transportation facilities and development of future projects.

7. Action Plan

Subsequently, an Implementation Plan with a set of recommendations by evaluated corridor will be developed. This plan will include estimated costs, time schedule and projected benefits over time.

8. Monitoring Program

The DCMMP/CMS provides a methodology to measure the effectiveness of the implemented strategies along corridors annually (see Technical Memorandum 2: Monitoring and Evaluation Manual (MEM)) Throughout this program, strategies could be modified for improvement as appropriate or new strategies could be implemented.

To illustrate the procedures established in the DCMMP/CMS, two corridors were evaluated as pilot studies. Additionally, other actions, mentioned at the end of this report, are also being taken locally to improve mobility.

DCMMP/CMS IN ACTION

Identification of Congested Corridors

Using the RCR method, over 150 congested roadway segments were identified using the criteria previously described. To provide continuity the steering committee defined a congested corridor as any congested segment that is 2 miles long or longer. Congested segments less than 2 miles long were defined as *congested spots*. Thirty-five congested corridors and 77 congested spots have been identified in Dade County. Congested corridors are shown in Figure 2.

Corridors Selected for Evaluation

Tables 1 and 2 list short, medium and long term congestion relief strategies for two sample corridors in Dade County. The two corridors were:

Bird Road: from 57th Ave to 87th Ave

This corridor is 3 miles long in a predominantly commercial area surrounded by a single family residential area.

SW 97th Avenue: from SW 200th St to US 1

This spot is only 1 mile long. It is located in a residential area and is used as a connector to the main arterial of the area (US 1).

Other strategies included in the Final Report are as follows:

- relocate and improve signal operation,
- turning movement restrictions,
- establishment of employee transportation coordinators (ETCs),
- provide sidewalk amenities,
- promote Bike Connection to Transit Program,
- establish a shuttle and express bus services connecting the area to transit stations.
- consider the establishment of one-way streets.

FUNDING

In Dade county, monies for transportation projects are derived from five major sources: Federal, State, Local government; Dedicated Revenues and User fees. Examples of each follow:

Federal: (typically split 80% federal and 20% state or local funds) from the Federal Transit Administration, Federal Highway Administration, and grants such as Federal Aviation Administration grant programs.

State: Usually 100% state funds are distributed among the various districts from Federal Interstate Highway System as well as non-Interstate highway programs, bridge rehabilitation, intermodal/rail programs and bond sales.

Local: Usually from Bond sales (General Obligation, special assessment and revenue bonds; state gas taxes such as State Fuel Tax, Comprehensive Enhanced Transportation System Tax, Constitutional Gas Tax, and County Gas Tax; and real estate property taxes.

Dedicated Revenue Funds: Motor vehicle fuel taxes and special assessments put aside for specific transportation projects. One type of special assessment may be established to fund a portion of design and construction costs for developing and implementing mobility strategies.

User Fee Funds: Tolls (highways and bridges); Fees (transit, motor vehicle license and development impact); and rental car surcharges.

The Final Report identifies sources of Florida statewide transportation in greater detail.

IMPLEMENTATION PLAN

The recommendations in the DCMMP/CMS report acknowledge the uniqueness of individual congested corridors and spots and the need to develop and apply varying strategies to mitigate congestion. Details of the evaluation process and findings are provided in the Monitoring and Evaluation Manual (MEM). The Final Report summarizes general recommendations for both corridors.

Recommended improvements will be considered for implementation by the appropriate agencies through the members of the DCMMP/CMS Study

DADE COUNTY MOBILITY MANAGEMENT PROCESS

(DCMMP/CMS)

CONGESTED CORRIDORS 1995

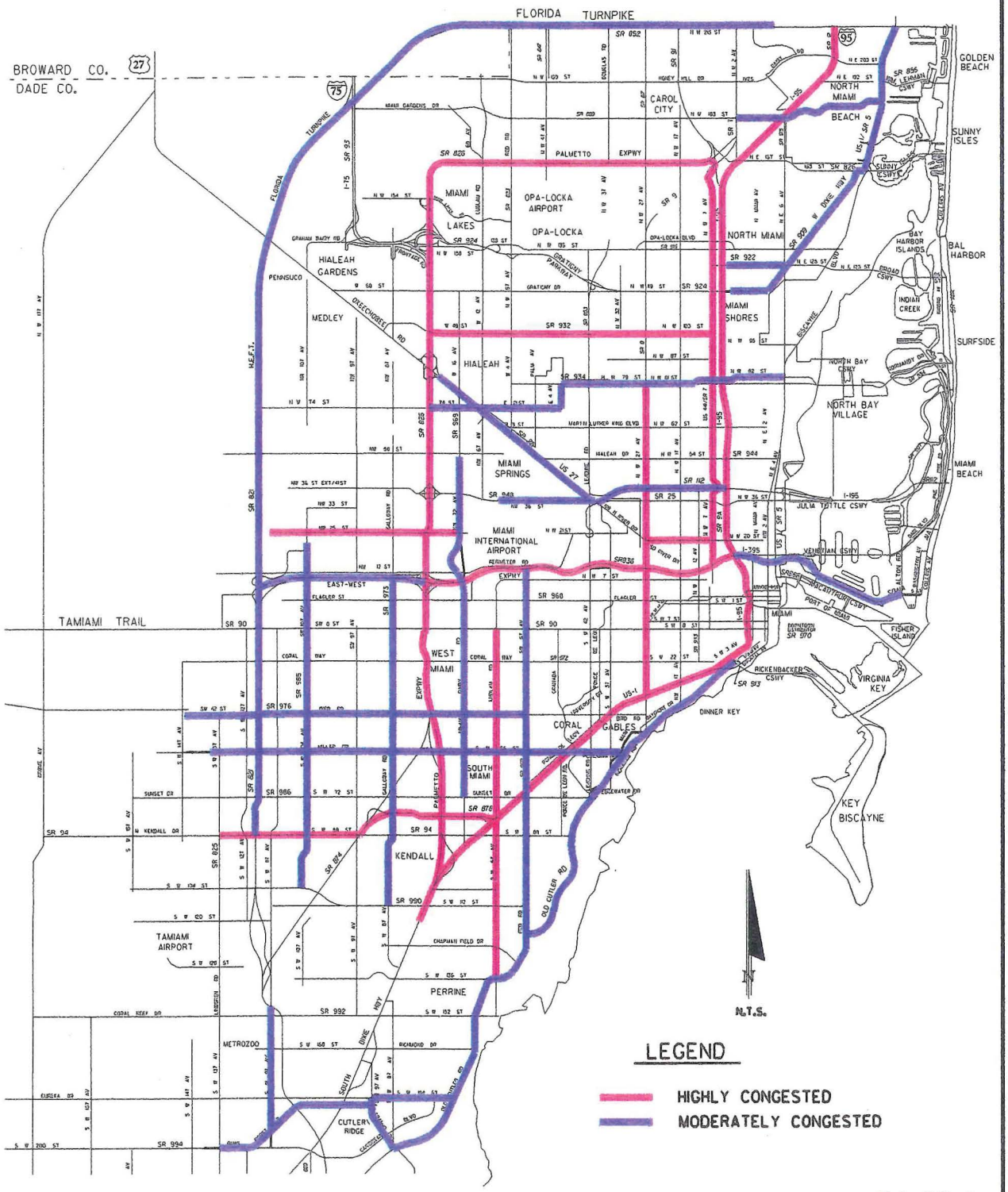


FIGURE 2

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TABLE 1: Recommended Strategies for Bird Road Corridor

Short Term

STRATEGY	DESCRIPTION
➢ Improve Transit Operation	• Reduce headways, re-locate bus stops, provide shelter and transit information.
➢ Alternative Work Hours	• Establish Alternative Work Hour Programs in companies located along the corridor.
➢ Provide Alternative Accesses	• Evaluate other access to the corridor that alleviate traffic congestion.
➢ Promote Carpool/Vanpooll Programs	• Contact employers to promote carpool and vanpool programs.
➢ Promote Transit Passes	• Develop a promotional campaign to encourage people to use transit passes.
➢ Install Bicycle Facilities	• Install bike racks, showers and lockers as appropriate.
➢ Marketing Information Program	• Develop a public transportation marketing program.
➢ Monitoring of Services	• Establish a monitoring program to measure the effectiveness of the implemented strategies.

Medium Term

STRATEGY	DESCRIPTION
➢ Sidewalk Facilities	• Provide sidewalks as appropriate, within the warehouse district.
➢ Development of TMAs	• Evaluate potential formation of a TMA in the warehouse district.
➢ Bus Turnout Bays	• Provide bus bays at bus stops, as appropriate.
➢ Bicycle Lanes	• Extend the proposed bicycle lanes in the Bike Plan to connect Tropical Park and the warehouse district area.
➢ Movement of Goods	• Coordinate with Freight Movement Study.
➢ Improve Loading Zones	• Coordinate with Freight Movement Study.
➢ Road Widening	• Evaluate widening of roads within the warehouse district.

Long Term

STRATEGY	DESCRIPTION
➢ Ramp Improvements	• Coordinate with FDOT proposed improvements to the ramps.
➢ Arterial Surveillance Program	• Recommend the incorporation of this corridor in the ICS project developed by FDOT.
➢ Construction of a New Roadway	• Construct connector between 74th Court and 72nd Ave as proposed in the Warehouse District Study.
➢ Develop Park and Ride Lot	• Evaluate potential park and ride lot developments along the corridor.
➢ Access Management	• Develop an Access Management Program for arterials.
➢ Bypass	• A Coral Way Bypass is recommended parallel to the Coral Gables Canal to alleviate congestion in Bird Road.

TABLE 2: Recommended Strategies for SW 97th Avenue Corridor

Short Term

STRATEGY	DESCRIPTION
➢ Improve Transit Operation	• Reduce headways, reduce bus stops, provide shelter and transit information.
➢ Intersection Improvements	• Optimize timing at traffic signals.
➢ Integrate Pedestrian and Transit	• Encourage people to use public transit.
➢ Monitoring of Services	• Establish a monitoring program to measure the effectiveness of the implemented strategies.
➢ Promote Bicycle and Pedestrian Activities	• Develop a marketing program to promote the use of bicycle and pedestrian facilities.
➢ Install Bicycle Facilities	• Install bike racks, showers and lockers as appropriate.
➢ Provide Pedestrian Amenities	• Develop projects to improve safety and security along the corridor.

Medium Term

STRATEGY	DESCRIPTION
➢ Bicycle Lanes	• Provide a bike lane on the west side of the corridor.
➢ Sidewalk Facilities	• Provide sidewalks on both sides of the corridor.
➢ Bus Turnout Bays	• Provide bus bays at bus stops, as appropriate.
➢ Road Widening	• Proceed to widen this corridor as programmed in the 1996-97 TIP and include recommendations made in this report.

Long Term

STRATEGY	DESCRIPTION
➢ Develop Park and Ride Lot	• Evaluate potential park and ride lot developments along the corridor.
➢ Feeder Bus System	• Evaluate the establishment of a feeder bus system using smaller vehicles to move people to transit stations.
➢ Arterial Surveillance Program	• Recommend the incorporation of this corridor in the ICS project developed by FDOT.
➢ Access Management	• Develop an Access Management Program for US 1 as an alternate parallel corridor.

Steering Committee. Implementation of any recommended improvements will be selected through use of miscellaneous project contracts (planning, design and construction) and through the using both agency and in-house efforts and consultants.

Improvements that cannot be implemented this way should be slated for inclusion in the UPWP and/or the TIP as appropriate by the DCMMP/CMS Coordinator.

RECOMMENDATIONS

The study has resulted in the following recommendations:

1. Incorporate the Dade County DCMMP/CMS into the long and short range transportation planning process. This will require amending the CDMP and the process for developing the LRTP and the TIP.

2. Incorporate procedures developed in the final report regarding the DCMMP structure, how to identify congested corridors and further evaluate strategies in the transportation planning process.

3. Implement the proposed improvements made for the Bird Road and SW 97th Avenue Corridors (see Tables 1 and 2).

4. Use data from existing sources and ongoing programs in the DCMMP/CMS.

5. Automatic Vehicle Location (AVL) is an emerging technology capable of monitoring vehicular speeds. A detailed evaluation of the results obtained during the AVL pilot project conducted by the City of Miami should be done. Cost effectiveness of this program should also be investigated.

   In this regard, MDTA is implementing an AVL project that could be used to monitor service conditions, as well as collect transit data.

6. A Decision Support System based on a GIS is being developed by FDOT District 6. It will be in electronic format and will include management systems for intermodal public transportation, congestion and traffic monitoring. Although the system will reside and be maintained by FDOT District 6, it should be made fully accessible to the MPO. The MPO on the other hand has established performance measures, evaluation criteria and the overall process. They should also develop a separate GIS system capable of interacting with that of FDOT.

7. FDOT will proceed with the implementation of the CMS despite the November, 1995 decision made by Congress to make it optional. Therefore, Dade County should develop element 2.04 of the 1996 UPWP entitled *Development of an Integrated Network Management System*. The objectives of this study are to develop management systems at the county level along with a software package that integrates the different procedures for each system.

8. The MPO and FDOT must work together in developing these management systems, more specifically, the DCMMP/CMS. Close coordination is also required in applying the process to FIHS roads as well as intermodal and transit facilities.

9. The evaluation of DCMMP/CMS strategies should be based on a range of tools that allow analysis at the appropriate level of detail. These may include regional transportation models, area-wide evaluation software, corridor level techniques, and project specific analysis. Techniques for evaluation should be customized for the particular DCMMP/CMS strategy in place.

10. MDTA should establish minimum standards for transit performance measures. This will help to compare the effectiveness of the service among routes and of the system in general.

11. A vehicle occupancy study is recommended to be included in the UPWP. This is important, and infrequently collected data needed for the evaluation of strategies . This study should also include a task to investigate and analyze state-of-the-art techniques in this aspect, that may reduce labor costs and obtain accurate data.

12. Adopted LOS standards should be used as the guide for identifying congested locations. The policy documents specifying these standards are the Dade County Comprehensive Development Master Plan (CDMP) and the Florida Intrastate

Highway Systems (FIHS) standards.

13. Long and short range land use programs, such as the CDMP, zoning regulations and ordinances, should be coordinated with congestion management activities.

14. The following guidelines are suggested for projects already in the TIP that provide for increasing roadway capacity:
    a. Projects with construction and/or ROW acquisition starting on or before FY 96-97: No reevaluation.
    b. Projects with design starting on or before FY 96-97: Reevaluation to add complimentary mobility strategies.
    c. Projects with PD&E/ corridor studies starting on or before FY 96-97: Complete evaluation including mobility strategies.

15. It is recommended that a new low cost improvement program be established to identify, streamline and implement effective improvements on a timely basis. In that regard, the DCMMP/CMS coordinator should be a member of both the LRTP and TIP Steering Committees in order to facilitate consistency in the process.

    Such a program would focus on expediting improvements that are low cost ($200,000 - $500,000) require no ROW, have local acceptance, do not adversely impact the environment and can be completed within a year.

FUTURE CONSIDERATIONS

To be meaningful the term *'mobility'* requires definition. Although the Task Force endorsed the concept of multiple measures of effectiveness, one of the more encompassing definitions was ***PERSONS X SPEED***. An explicit indicator of *"people movement"* and *"reasonable speeds or travel time,"* the measure can also be viewed as a partial indicator of "reasonable travel cost to society." Essentially, high speeds denote short travel times, therefore its usefulness as a unit of measure to travelers as well.

It is noted however that the term accounts for some but not all the elements that define mobility. Elements not addressed include: accessibility; modal choice; out-of-pocket, operation or capital costs; and making or satisfying the trip objective.

Although this measure would require additional data collection, it presents an interesting effectiveness criteria that can be used across all modes of transportation. Therefore, PERSONS X SPEED deserves further consideration, particularly if the data collection can be automated and retrieved from other data monitoring systems such as the proposed Advanced Traffic Management System.

OTHER RELATED DCMMP/CMS ACTIONS

Development of DCMMP/CMS is complete. Dade county endeavors to improve congested corridors and remove barriers to free-flow. In that regard, there are several ongoing studies and proposed actions underway.

- A Request for Proposal (RFP) to provide vans, maintain the equipment and manage a Vanpool Demonstration Program has been prepared.

- Arterial Investment Studies: Currently FDOT and the MPO are working together in the development of an AIS Study for SW 107th Avenue.

- The following studies expected to complement the system are either underway or in the consultant selection phase:
  - Freight Movement,
  - Countywide Parking Policy,
  - Dade County Integrated Network Management System,
  - Preparation of the Intelligent Transportation System Plan,
  - Continued Development of TMAs,
  - Development of a Superarterial Network and Development of Alternatives for Intermodal Improvement Studies.

The Bird Road and SW 97th Avenue pilot studies illustrate the usefulness of evaluating projects from the LRTP prior to their inclusion in the 5-year work program (TIP) through the DCMMP/CMS. Essentially, an amendment to formally integrate the DCMMP/CMS into transportation planning requirements for Dade County will ensure continued efficiency.

NOTES

For further information regarding the
Dade County
Mobility Management Process/ Congestion Management System,
please contact:

Metropolitan Planning Organization
111 NW First Street, Suite 910
Miami, FL 33128
(305) 375-4507

PREPARED BY DAVID PLUMMER & ASSOCIATES