

**CONGESTION MANAGEMENT PLAN  
BACKGROUND REPORT**

**TRANSPORTATION DEMAND MANAGEMENT AND CONGESTION MITIGATION STUDY**

**CONGESTION MANAGEMENT PLAN  
BACKGROUND REPORT**

**Prepared for:  
METROPOLITAN PLANNING ORGANIZATION  
METROPOLITAN DADE COUNTY, FLORIDA**

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## EXECUTIVE SUMMARY

The purpose of Dade County's *Transportation Demand Management and Congestion Mitigation Study* is to develop a Congestion Management Plan (CMP) that will reduce traffic congestion on the County's existing roadway system. To this end, a series of major study documents have been prepared in support of the CMP. They are:

*Current Efforts in Transportation Demand Management and Tools for its Implementation in Dade County;*

*Trip Reduction Ordinances: Technical Memorandum;*

*Travel Demand Management Reader & Bibliography;*

and this report:

*Congestion Management Plan: Background Report.*

This report contains the background information required to adequately plan for, and implement TDM actions in Dade County. It includes the definition and causes of roadway congestion; information related to the existing transportation facilities and proposed improvements; land use patterns of the area; recommended TDM actions; and proposed implementation strategies.

Chapter Two explores the causes of traffic congestion in Dade County, and defines roadway levels of service and the standards set by the County. Traffic congestion occurs when the demand placed the roadway facility exceeds its capacity. The problem typically is not too much demand for the facility, but rather too much demand for it during a specific time period, such as during *peak* hours. Increases in traffic congestion lead to driver frustration and further exacerbate combustion inefficiency and increased air pollution. All of these serve as reasons to reduce single occupant vehicles (SOVs) through TDM actions.

In order to adequately plan for, and implement TDM actions in Dade County, information related to the existing transportation facilities and land use patterns of the area must first be gathered and analyzed. This information, summarized in Chapter Three, was used to determine the locations where congestion is at its worst and employment densities are at their highest—the best candidates for TDM actions. Information is also presented on the location of TDM-related infrastructure such as transit, HOV lanes, and park-and-ride lots.

Chapter Four describes the TDM actions that are most appropriate for implementation in Dade County. They are grouped into three major categories: TDM actions directed at existing trips; TDM actions directed at new trips; and complimentary actions required to make the CMP a success. As previously stated, existing trips are those which are already on the road, generated by existing employment centers. New trips are those that will be generated by new development which is proposed, but not yet built. Complimentary actions—although not TDM actions in and of themselves—are support mechanisms created to assist in the implementation, marketing, and sustenance of the TDM actions.

The Plan to be adopted is contained in a separate document. It contains the specific recommendations based on the information contained in Chapter Five. These are actions that will be required in implementing a successful CMP. The five key action steps derived from these actions are:

1. Adoption and full political backing of the CMP, its goals, programs, and recommendations, through adoption by the MPO Board and the Board of County Commissioners;
2. Funding and implementation of the Plan and its proposed TDM actions in an orderly and well thought out manner;
3. Implementation of the TDM actions by the County at all of its offices and agencies as an example of how employer-based TDM actions work;
4. High profile public relations and education program promoting the benefits of the CMP and the TDM actions in particular; and
5. Widespread participation in the program by other public and private employers throughout the County.

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# 1. INTRODUCTION

*Dade County is a transportation oriented community. Since its major growth coincided with the growth of automobile ownership, its configuration was designed to accommodate this mode of transportation, resulting in a high degree of urban sprawl and congestion today.*

**- Traffic Circulation Element, Year 2000 and 2010  
Metropolitan Dade County Comprehensive Development Master Plan**

Congestion management has become the latest term to enter the transportation profession's lexicon. It connotes the realization by the field's professionals that it is no longer possible to build all of the infrastructure necessary to meet the demands of the American motoring public of owning a private automobile, paying little for its operation, and having the ability to use it, unimpeded, whenever they choose. Because of this, curbing the demand for the limited transportation infrastructure is now being seriously considered by all levels of government, through the use of transportation demand management techniques.

Transportation demand management (TDM) is generally defined as a systematic process of modifying the demand placed on the roadway system by vehicles, to achieve the goal of reducing the number of automobiles using the system, particularly during the peak hours. Demand reduction is generally focused on the private, single-occupant automobile and achieved through a variety of methods whose goal is to increase vehicle occupancy and reschedule trips around the peak travel hours. Transportation demand management strategies are aimed at relieving vehicular congestion, enhancing air quality, and promoting energy conservation. These are important to the implementation of the concurrency component of Florida's growth management act, the federal Clean Air Act Amendments (CAAA) of 1990 and the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.

To aid in the implementation of TDM strategies in Dade County, the Metro-Dade Metropolitan Planning Organization retained Barton-Aschman Associates, Inc., to undertake this *Transportation Demand Management and Congestion Mitigation Study*. The purpose of the study is to investigate a wide range of TDM alternatives available to the County, and to develop the best ways in which the County can implement state-of-the-art TDM techniques. The first deliverable of this effort was a report titled *Current Efforts in Transportation Demand Management and Tools for its Implementation in Dade County*. That report summarized the TDM alternatives available for implementation in the County, and the strategies with which to do so. This report, *Congestion Management Plan*, recommends specific TDM actions for implementation in Dade County, and establishes a plan with which to do so.

## **PURPOSE OF PLAN**

A congestion management plan (CMP) is intended to accommodate more users on existing facilities by managing the demand side of the transportation equation. In other words, a CMP is intended to encourage more efficient use of existing transportation facilities. This involves increasing the number of people transported on these facilities while reducing the number of (private) vehicles on them, particularly during peak traffic hours. Transportation demand management measures can be implemented relatively inexpensively, generally requiring little or no capital outlays, and providing for greater use of the facilities that are already in place.

### **Dade County's Congestion Problems: An Overview**

The root cause of the existing congestion problems in Dade County stem from its development as a sprawling, relatively low density metropolitan area. Until the mid-1970s, the core concentration of employment in Dade County had been in downtown Miami. To provide transportation services to this core, most expressway facilities and public transportation services were focused on the Downtown area. The development of suburban activity centers throughout the County, however, led to a dispersal of employment throughout the urban area. Today, downtown Miami continues to be the largest employment hub, but it has now been joined by other major employment and activity centers such as Miami International Airport and its vicinity, downtown Coral Gables, and the Dadeland/Datran area, to name a few. Additional suburban office and industrial developments are located throughout the County.

To meet the expanding transportation needs of the area, Metro-Dade, in partnership with the State of Florida and its 27 municipalities, has invested heavily in all modes of transportation. The Florida Department of Transportation Five-Year Work Program calls for a two billion dollar investment for improvements to existing, and construction of new, transportation facilities. There are a total of 2,932 lane-miles of state roadways which criss-cross the County, and many more county and local roads. Public mass transportation is provided by the Metro-Dade Transit Agency, which is a division within the county government, and which serves 268,600 passengers per day. The MDTA system includes a 21-mile, 21-station rapid transit line, a people mover system in downtown Miami, and a 576-bus fleet operating on 63 daily fixed routes.

In spite of this massive investment in all modes of transportation, travel by private automobile still accounts for more than 95 percent of the total urban travel in the County. This is due to the growth in population, the dispersed development patterns within the County, and a current ratio of 2.60 cars per household. As more people are employed at locations throughout the urban area, the work trip commuting patterns are changing from a Downtown focus to multiple commuting patterns. These development patterns encourage the use of the private automobile because they locate residences and employment at the periphery of existing public transportation system.

Today, over 60 percent of the key commuter roadway facilities in Dade County already operate below adopted level of service standards, and the average vehicle-miles travelled are projected to increase by 45 percent by the year 2010. Although the County's year 2010 roadway plan identifies over 200 major highway projects to cope with the existing and projected roadway congestion problem, it is still anticipated that a large number of roadway facilities will operate below the adopted standards.<sup>1</sup>

### **Need for a Plan**

Increasing congestion and the inability to fund all of the necessary roadway improvements has consequences related to urban mobility, air quality, federal planning requirements, and the adequate facilities requirement (concurrency) of Florida's growth management legislation. In addition to continued improvements in the transportation infrastructure—because TDM in and of itself will not solve the urban congestion problems—the actions contained in the congestion management plan will aid Dade County in addressing the issue which are discussed below.

**Mobility and Economics.** The first issue related to traffic congestion is that of urban mobility and economics. As congestion continues to deteriorate the flow of traffic, not only does it become more inconvenient for motorists to use the facilities, but there is also an added cost in time and money associated with it. The added costs borne by commuters in lost time and added fuel costs due to traffic congestion serves to take away the potential for added investment in other sectors of the local economy. On a national level, the average costs in lost productive time due to commuting in the 25 largest U.S. cities are estimated to be in excess of 42 billion dollars.<sup>2</sup>

**Air Quality.** The second issue related to congestion is air quality. As congestion worsens, so does the air quality in the urban area. Dade County has been designated a "moderate" area by the federal Environmental Protection Agency (EPA). Based on the 1991 CAAA, by being classified in the moderate range, the County is required to reduce its overall mobile emissions by 15 percent by 1997. If the County fails to take steps toward this goal, it will automatically be designated as the next worst category (serious), regardless of the actual emissions, and be required to undertake stricter measures. Transportation demand management actions are an EPA-accepted way of reducing emissions. Adoption and implementation of a CMP are first steps in doing so.

**ISTEA Requirements.** The federal Intermodal Surface Transportation Act of 1991 requires all MPOs to adopt a long-range transportation plan biennially. The plan must

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<sup>1</sup>Jose-Luis Mesa, "Transportation Issues in Metropolitan Dade County: A Preliminary Assessment," Metro-Dade Metropolitan Planning Organization, April 5, 1991.

<sup>2</sup>Lawrence Schulman, Urban Mass Transportation Administration, remarks to the Metropolitan Dade County Regional Mobility Forum, April 5, 1991.

identify transportation facilities that function as an integrated transportation system, include a financial plan, assess capital investment, and other measure necessary to preserve the existing transportation system and make the most efficient use of existing transportation facilities. This includes identifying projects to relieve congestion through the use of travel demand reductions.

**Concurrency.** Florida has mandated that adequate public facilities, including roadways, must be in place prior to the issuance of development approvals for new development. As congestion on roadways worsens, Dade County is severely limited in the amount of new development and redevelopment it can permit within its jurisdiction under concurrency. Given the concurrency rules, most new development is forced into suburban and exurban areas of the County, where highway capacity is still available. These are areas that are poorly served by public transportation. As a result the transportation mode used by the residents of this new development is the single-occupant private vehicle (SOV) which creates additional traffic on the roadway system and deepens the existing congestion and emissions problems.

## **PLAN COMPONENTS**

There are three main components to the CMP. The first two are support components to the plan, while the last is the plan itself. The first component reviews the existing transportation conditions and land use patterns. The second relates to the TDM actions that are recommended for implementation, and the third relates to the plan for implementing the TDM actions. These three components of the CMP are discussed in greater detail later in this document, however, an overview is presented here.

### **Existing Conditions**

In 1988, Metro-Dade County adopted its Year 2000 and 2010 Comprehensive Development Master Plan. This effort included an extensive data gathering and analysis process that, among others, included land use, population, employment, and transportation statistics for the County. This information serves as the basis for development of the CMP recommendations, and is therefore presented in the existing conditions section of this Plan.

### **TDM Alternatives**

Current research in TDM shows that no single TDM measure will provide the community with significant reductions in transportation demand. However, research has shown that a combination of several measures, along with the appropriate implementation framework and funding, will result in significant reductions.

A program of low cost and long-term actions aimed at reducing the demand of existing as well as new trips are explored and recommended in this plan. Existing trips

which can be affected by TDM are those which are already occurring today, primarily from existing employers.<sup>3</sup> New trips are those which will be generated by proposed, but not yet built, employment centers. The plan's package of low cost measures can, and should be implemented immediately. These are actions which need little lead time to execute, or are actions which have the support mechanisms for them already in place (such as those requiring transit use, or commuter-assistance programs). The long-term measures are those that may require additional study, stronger political backing, or advanced technologies. These actions, although just as worthy of consideration and implementation as the low cost actions, will require more time to implement. The combination of actions, low cost and long-term, aimed at existing trips and new trips, will insure that significant reductions in transportation demand are achieved immediately, and that reductions achieved in the short run will not dissipate over time.

### **Framework for Implementation**

Each of the recommended TDM actions, in and of themselves, will not achieve a significant amount of congestion relief. Implementing more than one of them in a haphazard manner may have the effect of undercutting the effects of all of them.

**Adoption.** It is important that the recommended TDM actions be implemented based on a coordinated plan, which is understood and supported by all of the transportation-related agencies in Dade County. To solicit this support and assure coordination of actions, the Dade County Board of County Commissioners should ultimately adopt the plan. Prior to adoption, however, the following boards, committees, and agencies should be included in its review process:

- 1 Gold Coast Commuter Services (GCCS);<sup>4</sup>
- 2 Florida Department of Transportation (FDOT);<sup>4</sup>
- 3 Center for Urban Transportation Research (CUTR);<sup>4</sup>
- 4 Metro-Dade Transit Agency (MDTA);<sup>4</sup>
- 5 Metro-Dade Planning Department;
- 6 Metro-Dade Development Impact Committee (DIC);
- 7 MPO Staff;<sup>4</sup>
- 8 Citizen's Transportation Advisory Committee (CTAC);
- 9 Transportation Plan Technical Committee (TPTAC);
- 10 Transportation Planning Council (TPC); and
- 11 Metropolitan Planning Organization (Governing Board);

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<sup>3</sup>TDM measures generally focus on the work trip because they account for the majority of the vehicle trips made during the peak travel times.

<sup>4</sup>Represented in the study's Technical Steering Committee.

**Implementation Strategies.** Once the plan has been reviewed and adopted, implementation strategies can be initiated for the promotion and execution of TDM actions at existing employers. These strategies include:

- Promotion and technical support of employer-based TDM actions by County and GCCS staff;
- Creation of Transportation Management Associations (TMAs) at selected locations;
- Improvement of TDM-related infrastructure (such as upgrading of high-occupancy vehicle facilities, park-and-ride lots, and mass transit); and
- Amendment, where necessary, of the administrative rules of the County which relate to transportation requirements of new development, so that TDM actions aimed at new employers can be initiated.

## **COORDINATION OF TDM ACTIONS**

A wealth of information and technical assistance for planning and implementing TDM actions is now available from a number of state agencies. Dade County is already benefitting from this assistance with the participation of FDOT, GCCS, and CUTR in the Technical Steering Committee for this study. In addition, funding for the formation of qualified TMAs has been allocated by FDOT.<sup>5</sup>

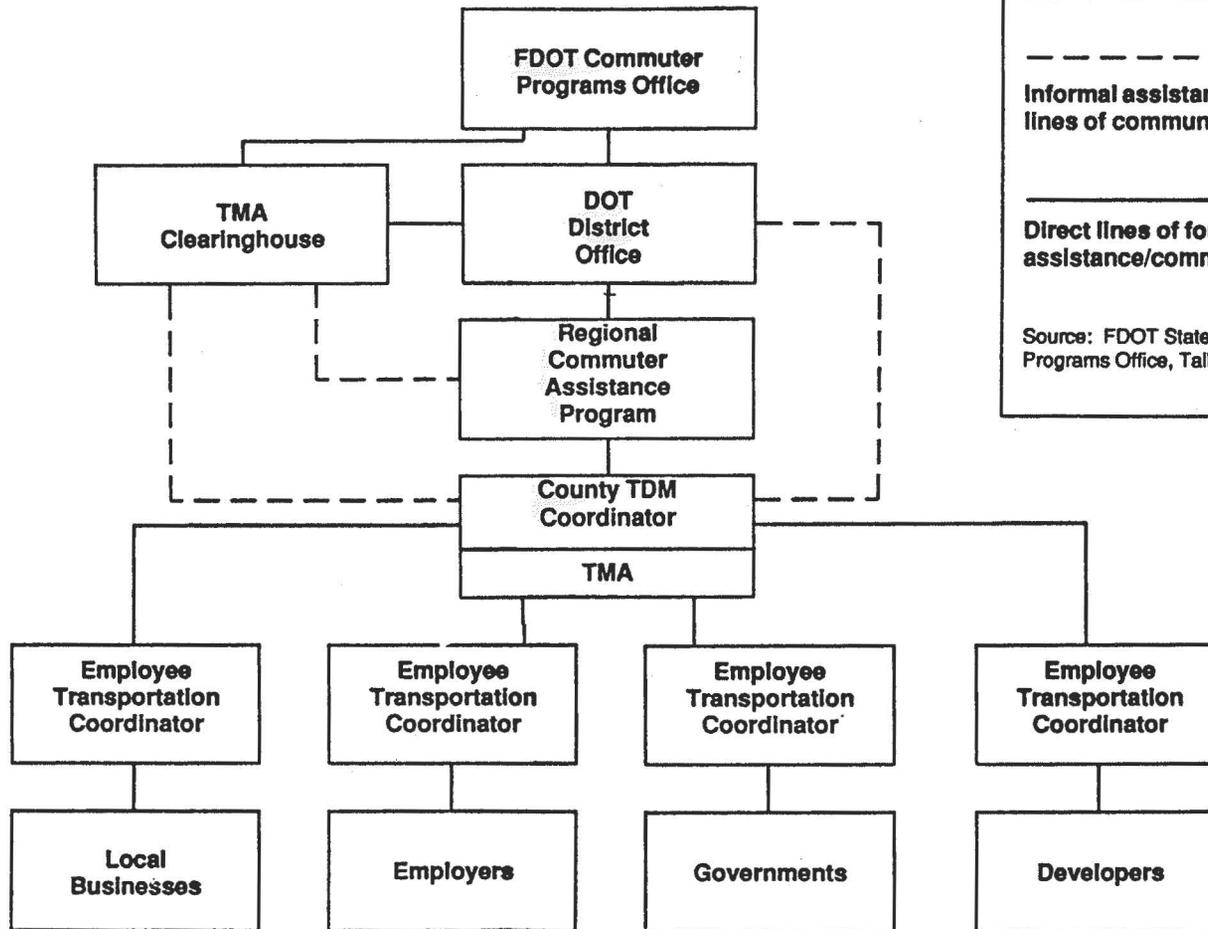
The need for coordination of the planning and implementation of TDM actions has already been addressed by FDOT for the coordination of TMA formation. Because the majority of the TDM actions proposed in this plan will require the participation of staff from the county, the state, and private employers, regardless of whether they are implemented through a TMA, the need for coordination among agencies will be of critical importance. The FDOT procedure for implementing and coordinating the Department's Commuter Assistance Program places the FDOT Commuter Programs Office, FDOT District Office, and the Regional Commuter Assistance Program (GCCS in Dade County) at the head of coordinating these programs. The flow chart shown in Figure 1 illustrates this process.

A similar coordination process may be established for implementing the County's CMP by substituting the staff charged with this effort in the place of the TMA on the Figure 1 flow chart. In fact, in many circumstances, particularly where a single large employer is present, a TMA need not be formed to implement TDM actions. In these cases, a staff

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<sup>5</sup>Qualifications are based on FDOT Policy 725-030-008-b, January 16, 1992.

person—called an employee transportation coordinator (ETC or TC). The ETC is employed by the firm and works at implementing TDM actions tailored for the particular employer. The ETC is able to enjoy the same assistance benefits offered to TMAs from the Regional Commuter Assistance Program and the FDOT.



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Informal assistance/potential  
lines of communication

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Direct lines of formal  
assistance/communication

Source: FDOT Statewide Commuter  
Programs Office, Tallahassee.

## **2. CONGESTION**

Traffic congestion occurs when the demand placed the roadway facility exceeds its capacity. The problem typically is not too much demand for the facility, but rather too much demand for it during a specific time period, such as during *peak* hours. The trends in Dade County suggest a worsening of congestion problems, given that the demand for the facilities during the peak hours is growing faster than the supply of roadway capacity. This is further aggravated by the shift in travel patterns from CBD-oriented peak hour travel to the more diffuse suburb-to-suburb commutes. Increases in traffic congestion lead to driver frustration and further exacerbate combustion inefficiency and increased air pollution. All of these serve as further reasons to reduce SOVs through TDM actions.

This chapter explores the causes of traffic congestion in Dade County, and defines roadway levels of service and the standards set by Dade County.

### **CAUSES**

Urban traffic congestion is primarily a problem which occurs during traditional peak periods, when most motorists are commuters. Therefore, changes in the labor force and employment, as well as land use patterns that affect commuting patterns, represent major factors in the demand side of the transportation equation. The key elements of travel demand, and their local characteristics are discussed below.<sup>6</sup>

**Population.** Historically, Dade County has experienced rapid population growth. Between 1910 and 1960, the County's population doubled every decade. After 1960, the county's population grew by 35.6 percent between 1960 and 1970, 28 percent between 1970 and 1980, and 16 percent between 1980 and 1990. This growth in population, by necessity, translates into more travel on the County's transportation system, especially the roadways.

**Labor Force.** Sharp increases in the County's labor force in the 1970s and 1980s resulted from the general maturation of the baby boom generation, women's increasing participation in the labor force, and the influx of immigrants from other parts of the United States and abroad. While the County's population growth over the last 20 years has averaged 22 percent, its job growth increased by 30 percent.

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<sup>6</sup>Data in this section was obtained from Metro-Dade County Planning Department in *Land Use Element (Support Components) Year 2000 and 2010 Comprehensive Development Master Plan*, April 1988.

**Changing Business Composition.** Employment growth in Dade County between 1976 and 1986 was dominated by Construction (66 percent), Finance, Insurance, and Real Estate (51 percent), and Wholesale and Retail Trade (41 percent and 35 percent, respectively). Meanwhile, Manufacturing grew by only ten percent. The significant growth in the service and trade sectors resulted in a substantial increase in the share of new employment located in office buildings, as opposed to industrial locations.

**Suburbanization.** The decentralization of population in metropolitan areas has been a national phenomenon since the end of World War II. In 1970, 75 percent of Dade County's population lived in an area roughly bounded by the county line on the north, the Palmetto Expressway on the west, and Sunset Drive on the south. This area accounted for only 60 percent of the population by 1990. In addition to the suburbanization of residents, since 1980, the trend towards suburbanization of employment gained considerable momentum. Downtown Miami accounted for the majority of office space in the metropolitan area in 1970, but declined to 40 percent by 1990. The major consequence of the development of large suburban activity centers outside of downtown Miami is that these new suburban centers are frequently located at the crossroads of only two major routes or even along a single freeway corridor, while downtown is served by mass transit, as well as numerous expressways and surface arterials.

**Commuting Patterns.** The result of this suburbanization of people and jobs has been substantial increase in the number of commuters living and working in the suburbs, and a corresponding increase in auto travel. Between 1985 and 2005, the increase in travel is estimated to increase by 50 percent from 5.2 million trips per day to 7.7 million. The corresponding increase in vehicle miles travelled (VMT) is also projected to increase by 50 percent, from 20.8 million in 1980 (data for 1985 not available) to 32.2 million by 2005.

The growth in travel demand was further exacerbated by the inability of the County to keep pace with the construction of new transportation facilities. There have been two key reasons for this: citizen opposition to major new facilities and institutional conflicts.

**Citizen Opposition to New Expressways.** Growing concern about highway construction in American urban areas during the early 1960s became a national "freeway revolt" that effectively stopped most urban highway construction throughout the country. The citizens of Dade County were no exception, and in 1971 stopped the design and construction of the urban freeways proposed in the Miami Urban Area Transportation Study (MUATS). This opposition to local expressways led to passage of the 1972 Decade of Progress bond issue to provide the local share for mass transit improvements. In response, the Metro-Dade Planning Department produced a new Comprehensive Development Master Plan which deleted the proposed expressways and provided for additional arterial streets, buses, and a heavy rail rapid transit system (Metrorail) in its place.

**Institutional Conflicts.** The overall transportation planning process in Dade County is a joint effort among various federal, state, regional, county, and municipal agencies.

Although this joint effort has produced many successes, it has also been the cause of many incomplete projects. This is especially true on state roadways within incorporated areas of the County, where three different jurisdictions (city, county, and state) have varying opinions as to the proper use and operational condition of the facility. While the transportation agencies may propose additional capacity, other governmental agencies and legislatures may oppose them causing a sometimes permanent delay in their construction.

## **ROADWAY LEVELS OF SERVICE**

The cause of congestion is the volume of traffic that is on a particular roadway facility at a given time. Qualitative and quantitative measures of congestion are provided by the 1985 *Highway Capacity Manual* (HCM). It states that the concept of level of service is defined as a measure which describes operational conditions within a traffic stream, and their perception by motorists. Level-of-service (LOS) definitions generally describe these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

### **1985 HCM Definitions**

Six levels of service are defined for each type of roadway facility for which analysis procedures are available. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. In general, the qualitative definitions of the various levels of service for uninterrupted flow facilities (freeways) are presented below. Figure 2 illustrates these definitions and provides additional qualitative and quantitative information for each designation.

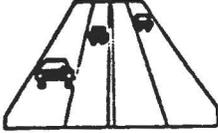
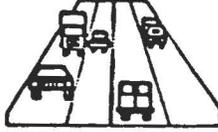
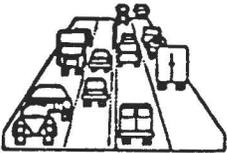
**LOS A** represents free flow conditions. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high, and the general level of comfort and convenience provided to the motorist is excellent.

**LOS B** is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

**LOS C** is in the range of stable flow, but marks the beginning of the range in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

**FREEWAY LEVEL OF SERVICE**

**TECHNICAL DESCRIPTORS**

|          |   | <b>FLOW CONDITIONS</b>   | <b>OPERATING SPEED</b> | <b>DELAY RATING</b> | <b>SERVICE</b> |
|----------|---|--|------------------------|---------------------|----------------|
| <b>A</b> |    | Highest quality of service. Free traffic flow, low volumes and densities. Little or no restriction on maneuverability or speed.        | 55+                    | None                | Good           |
| <b>B</b> |    | Stable traffic flow, speed becoming slightly restricted. Low restriction on maneuverability.   | 50                     | None                | Good           |
| <b>C</b> |    | Stable traffic flow, but less freedom to select speed, change lanes, or pass. Density increasing.                                      | 45                     | Minimal             | Adequate       |
| <b>D</b> |   | Approaching unstable flow. Speeds tolerable but subject to sudden and considerable variation. Less Maneuverability and driver comfort. | 40                     | Minimal             | Adequate       |
| <b>E</b> |  | Unstable traffic flow with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability and low driver comfort.      | 35                     | Significant         | Poor           |
| <b>F</b> |  | Forced traffic flow. Speed and flow may drop to zero with high densities.  | <20                    | Considerable        | Poor           |



**LOS D** represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level. Level-of-Service D is the typically adopted operating standard for roadway operations in an urban area.

**LOS E** represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give away" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns. As will be described in the next section of this document, this is the operating condition Dade County has adopted for most of the roadways within the urban area.

**LOS F** is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level-of-Service F is used to describe the operating conditions within the queue, as well as the point of breakdown in the flow of traffic. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good. Nevertheless, it is the point at which arrival flow exceeds discharge flow which causes the queue to form, and LOS F is an appropriate designation for such points.

### Dade County's LOS Standards

Based on the requirements of the Local Government Comprehensive Planning Act of 1985, Dade County adopted roadway level of service standards for the purposes concurrency management. This means that new land development is not permitted on sites where the proposed development's traffic will impact roadways which operate below the adopted standard. The Metro-Dade interim roadway level of service standards (1989-1994) are as follows:

|                                      | <u>Within UDB</u> | <u>Outside UDB</u> |
|--------------------------------------|-------------------|--------------------|
| State Freeways & Principal Arterials | E                 | C                  |
| State Minor Arterials                | E                 | C                  |
| County Roads                         | E                 | D                  |

(Except roads already operating at LOS E, which are allowed an additional volume of ten percent between the UIA and the UDB, and 15 percent inside the UIA.)

The County's long-term roadway level of service standards (beginning in 1995) are as follows:

|   | <u>Within UIA</u> | <u>Between UIA &amp; UBD</u><br>(With no transit service available) | <u>Outside UDB</u> |
|---|-------------------|---|--------------------|
| State Freeways  | E                 | D   | C                  |
| State Principal Arterials                                     | E                 | D   | C                  |
| State Minor Arterials   | E                 | E   | D                  |
| County Roads  | E                 | D   | C                  |
| (With transit service at 20 minute headways)                  |                   |   |                    |
| State Freeways  | 120% E            | E   | C                  |
| State Principal Arterials                                     | 120% E            | E   | C                  |
| State Minor Arterials   | 120% E            | E   | D                  |
| County Roads  | 120% E            | E   | C                  |
| (With "extraordinary" transit service -Metrorail or Tri-Rail) |                   |   |                    |
| State Freeways  | 150% E            | 120% E  | C                  |
| State Principal Arterials                                     | 150% E            | 120% E  | C                  |
| State Minor Arterials   | 150% E            | 120% E  | D                  |
| County Roads  | 150% E            | 120% E  | C                  |

(UDB - Urban Development Boundary; UIA - Urban Infill Area)

Adoption of LOS E, and below, for roadways within the UIA and UBD is an appropriate strategy for an urban county such as Dade. Lower levels of service allow for more efficient use of the roadway facilities, and serves as an impetus for infill development within the County. Lower level of service standards, however, should not be misinterpreted as relieving the County of the need for a CMP. In fact, lower levels of service mean that the traffic on the County's roadway system will be allowed to degenerate to severely congested conditions. These conditions, as previously stated, lead to further driver frustration when using the congested roadway system, additional cost in time and fuel, and increases in auto emissions from slow-moving vehicles. Because of this, the need for adopting and implementing the TDM actions recommended in the plan is crucial.

### **3. EXISTING & FUTURE CONDITIONS**

In order to adequately plan for, and implement TDM actions in Dade County, information related to the existing transportation facilities and land use patterns of the area must first be gathered and analyzed. This information is used to determine the locations where congestion is at its worst and employment densities are at their highest—the best candidates for TDM actions. Information is also presented on the location of TDM-related infrastructure such as transit, HOV lanes, and park-and-ride lots. All of this information will ultimately be used for the implementation of the recommended CMP actions.

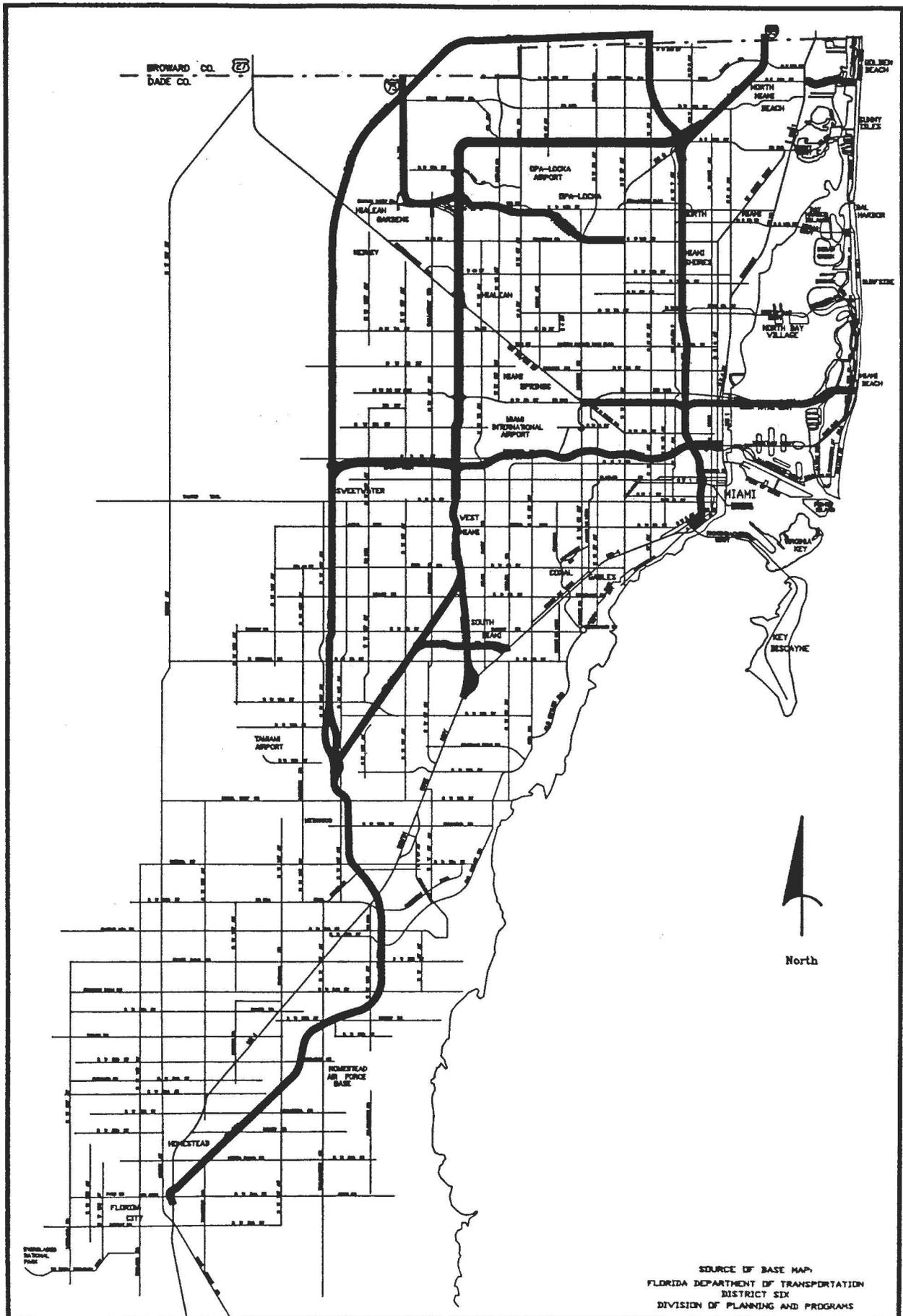
#### **ROADWAYS**

All roadway facilities serve two distinct, but equally important functions, traffic movement and property access. The relative weight given to one or the other of these functions establishes the functional classification of the roadway facility. There are three basic categories in which roadways are classified: arterials, whose function is to carry long-distance trips and whose land access function is minimized; collectors, whose function is to distribute traffic from arterials to local streets and serve abutting property; and local streets, whose sole function is to provide access to abutting property. There are a number of sub-categories within these three functional classifications, such as major and minor, which further define the role of the facility.

For the purposes of congestion management, only roadways that are classified as arterials are considered. Local and collector roadways typically do not serve a volume of traffic high enough to create consistently congested conditions, nor is their purpose one of long distance travel. Even when congested conditions do occur on these facilities, it is unwise to implement actions which may cause vehicles to operate at higher speeds (by eliminating congestion which serves as a natural brake) given their relative importance to the land access function. Dade County has 738 centerline miles of arterial roadways. These are split into state principal and minor arterial facilities (555), which include state numbered routes and limited access facilities, and county minor arterials (183). Figure 3 shows the County's arterial roadway system.

#### **Existing and Future Levels of Service**

In 1989, the Dade County Public Works Department undertook a study of all of the arterial roadway facilities within the County to determine their operating conditions. The study was based on P.M. peak hour volumes compared to the facility's existing capacity, based on the FDOT methodology for determining the capacity of a roadway. The LOS of



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 TRANSPORTATION DEMAND & CONGESTION MITIGATION STUDY  
 DADE COUNTY, FLORIDA

**ARTERIAL ROADWAY SYSTEM**  
**FIGURE 3**

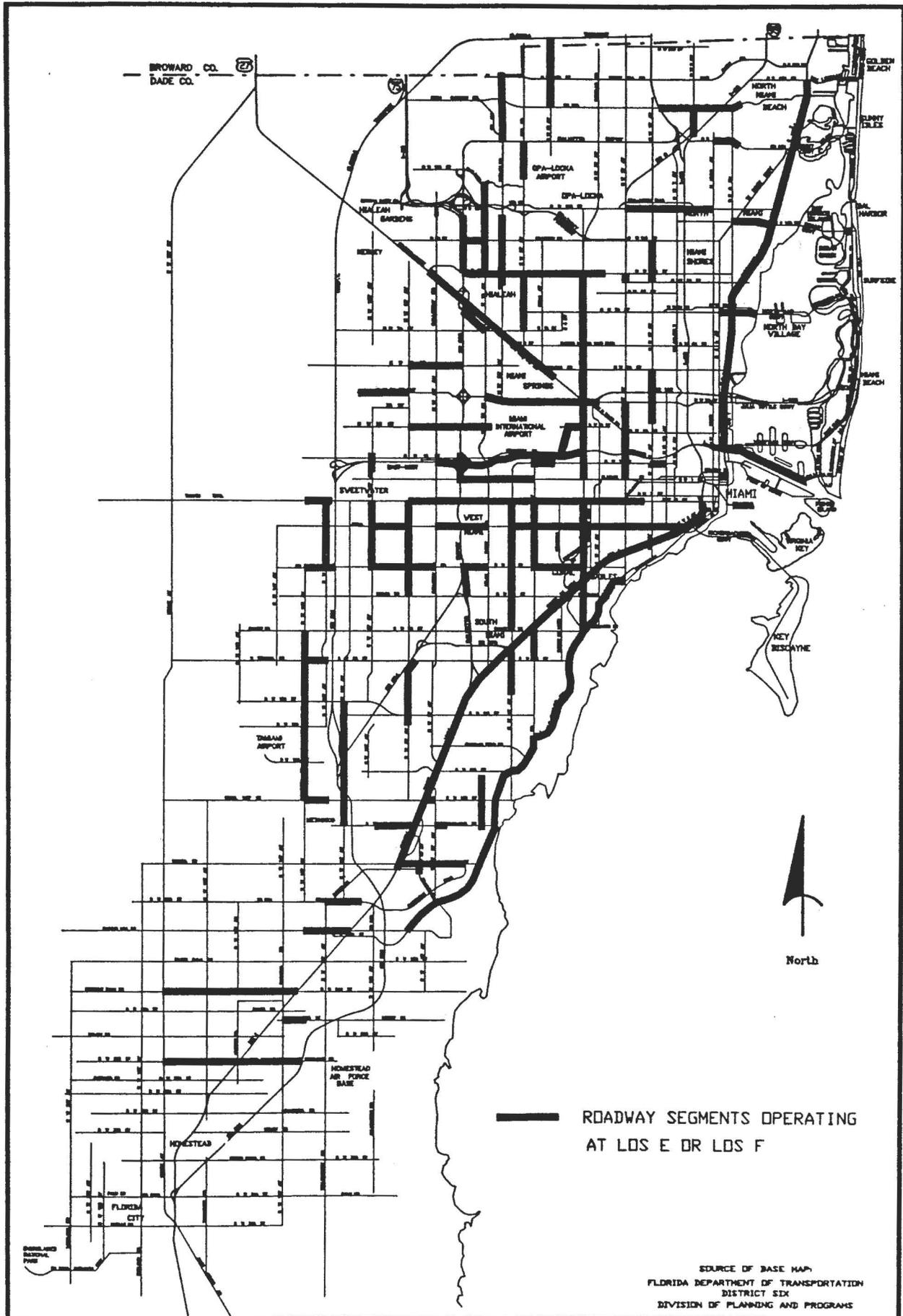
every major roadway segment in the County is shown in Figure 4. Major arterial corridors already operating at LOS F included U.S. 1 (both South Dixie Highway and Biscayne Boulevard), LeJeune Road, N.W. 36th Street, and N.W. 103rd Street. Interestingly, most of the limited access facilities were not found to be operating below LOS D.

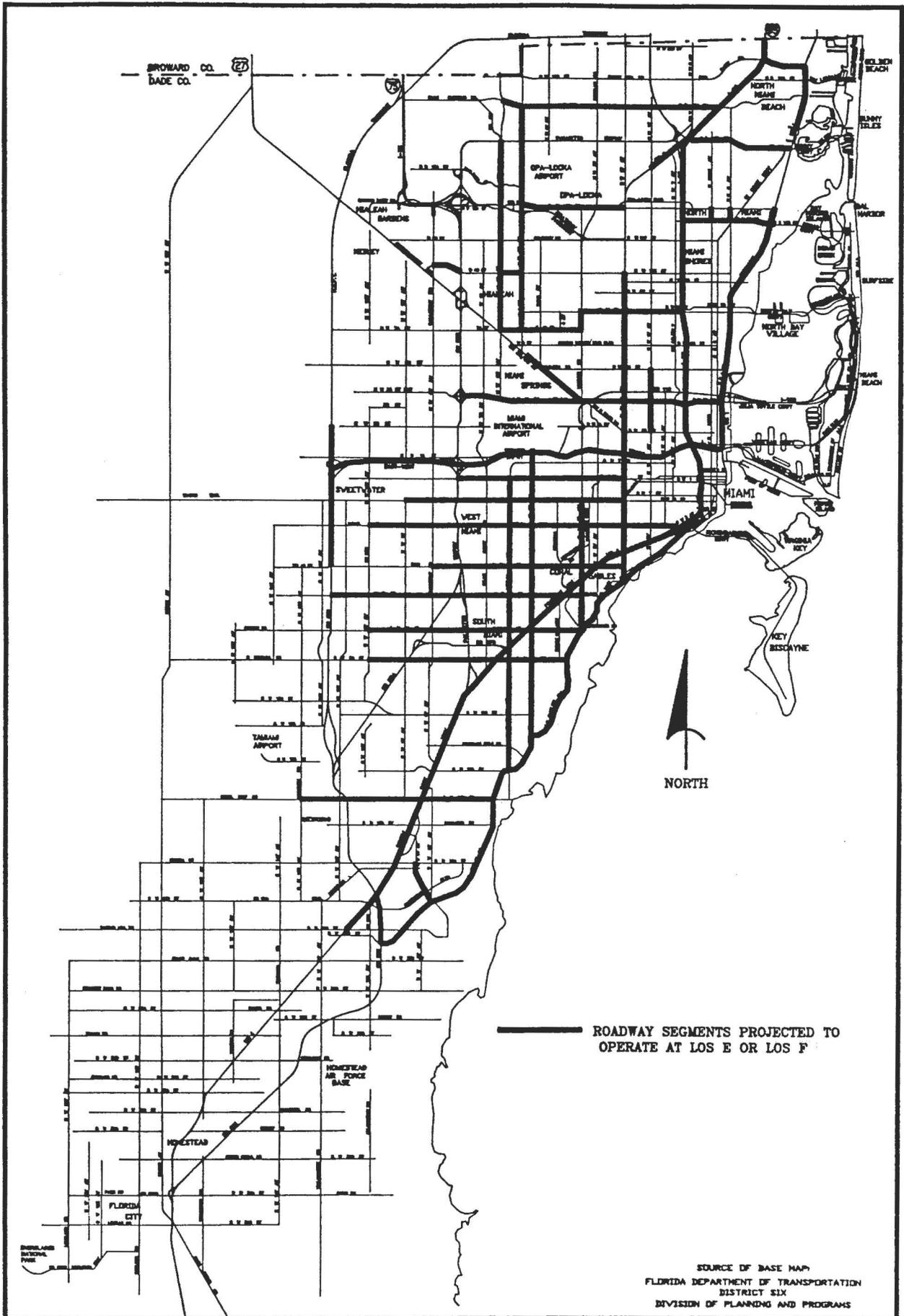
Although many of the roadways which operate over-capacity are located within the UIA—meaning that they are within the County’s adopted LOS standard—it is important to recall the definition of LOS E and F. Motorists on a roadway operating at these levels of service experience significant delays, and operate at speeds of less than 35 miles per hour (on facilities designed for 40 - 55 mph). These delays have costs associated with them related to time lost, energy wasted, and environmental degradation. Thus, operating conditions below LOS D, a condition that is considered congested, require the attention of this plan.

Figure 5 shows the roadway facilities projected LOS by the Year 2005. In the Traffic Circulation Element of the County’s Comprehensive Development Master Plan, the Metro-Dade Planning Department indicated that peak hour traffic in many parts of the County would deteriorate despite additional major highway and transit improvements. Major arterials predicted to operate below LOS D included U.S. 1 (both South Dixie Highway and Biscayne Boulevard), LeJeune Road, N.W. 36th Street, and N.W. 103rd Street. By 2005, I-95, S.R. 836 (Dolphin Expressway), portions of the Homestead Extension of the Florida Turnpike (HEFT), Miami Gardens Drive, N.W. 79th Street, Flagler Street, S.W. 8th Street, N.W./S.W. 107th Avenue, and six other east-west streets were also predicted to operate below LOS D.

### **Planned Improvements**

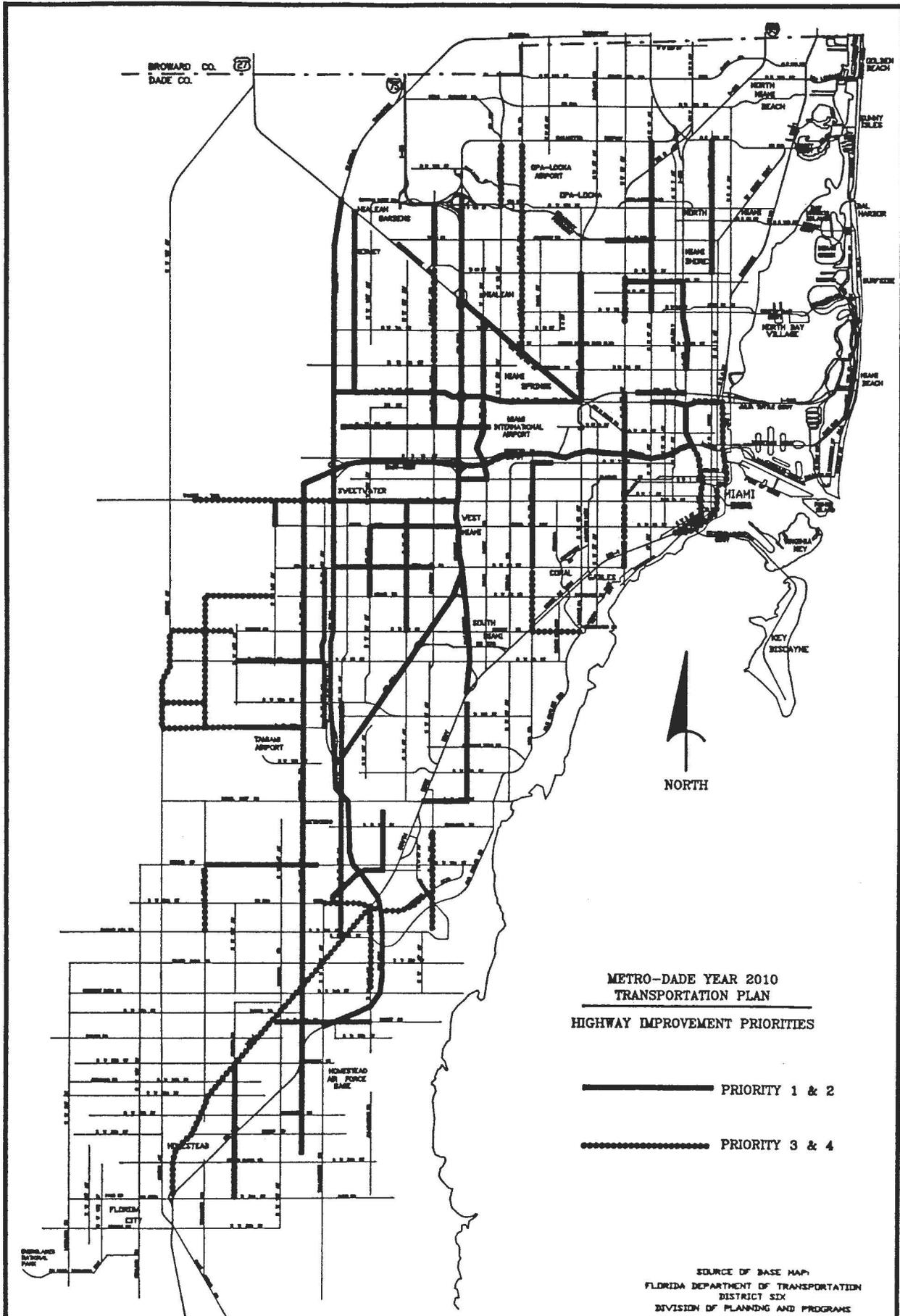
To meet the existing and future improvement needs of the arterial roadway system, the Dade County Metropolitan Planning Organization recently adopted the *Metro-Dade Transportation Plan and Improvement Priorities Long-Range Element to the Year 2010*. The Long-Range Element recommends a number of highway and transit capacity improvements considered to be necessary to effectively meet the transportation needs of the county. The recommended actions are based on an extensive analysis of travel demand and level of transportation service. While the goal of most of the improvements presented in the element were defined to address the County’s adopted level of service standards, in many instances the recommended roadway improvements will not meet the standards because of physical, operational, legislative, or other constraints. Therefore, regardless of the improvements shown in Figure 6, many of the roadways will continue to operate at levels that are defined as congested.





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**FUTURE ROADWAY LOS**  
**FIGURE 5**



METRO-DADE YEAR 2010  
TRANSPORTATION PLAN  
HIGHWAY IMPROVEMENT PRIORITIES

- PRIORITY 1 & 2
- - - - - PRIORITY 3 & 4

SOURCE OF BASE MAP:  
FLORIDA DEPARTMENT OF TRANSPORTATION  
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PLANNED ROADWAY  
IMPROVEMENTS  
FIGURE 6

## **MASS TRANSIT**

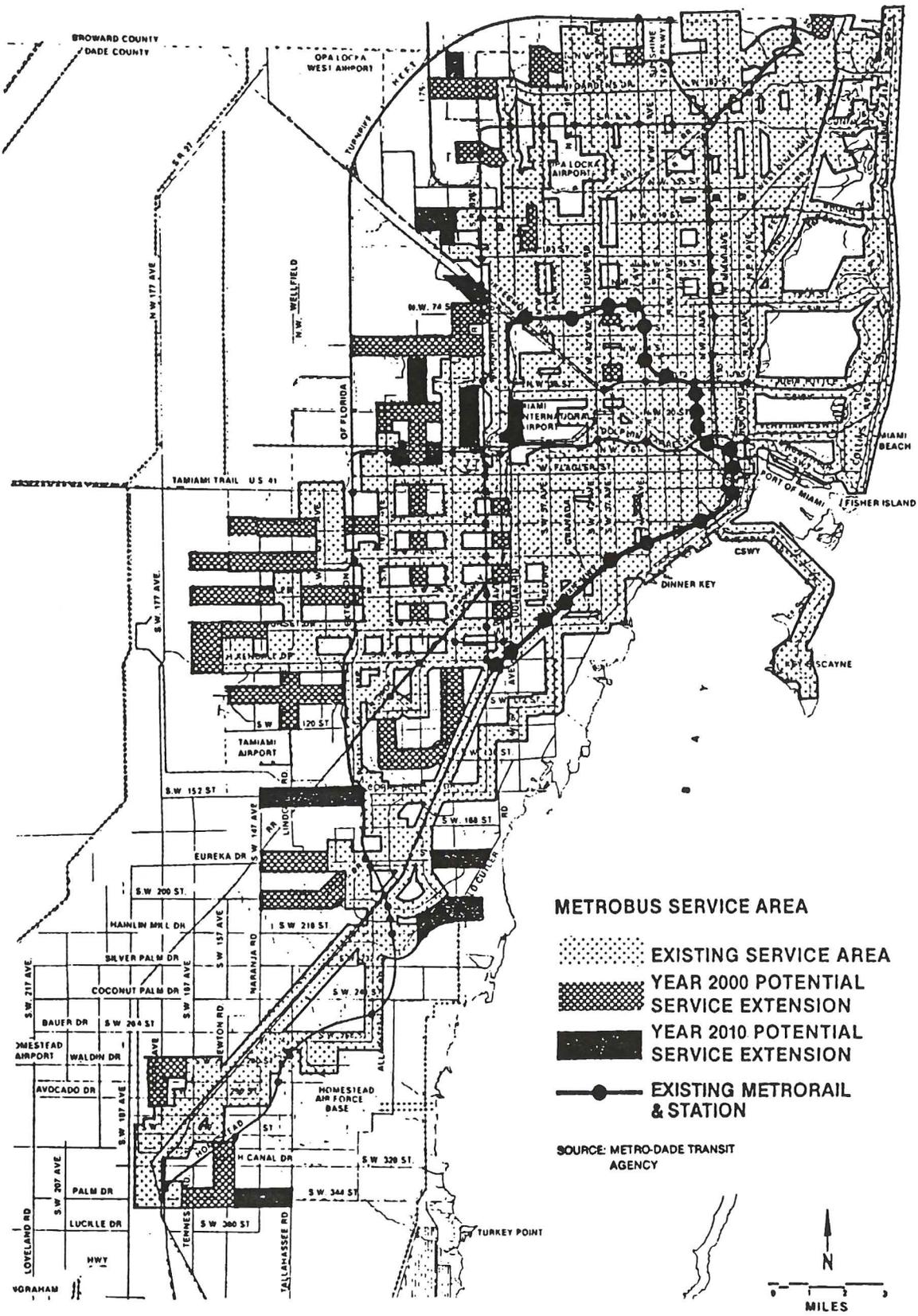
The Metro-Dade Transit Agency is the largest provider of mass transit services in the County. The MDTA system is comprised of four elements: Metrorail, a 21-mile/ 21 station heavy rail system; Metromover, a rubber-tired 10-station loop which serves the downtown Miami core, and as the distributor system for Metrorail; Metrobus, a 576-bus, 63-route bus system which provides local routes, and special, limited and express service; and specialized, demand-responsive Paratransit Services. Other providers of mass transit service in the County are the Tri-County Commuter Rail Authority, which operates a commuter railroad that links downtown West Palm Beach (its northern terminus) to the N.W. 79th Street Metrorail Station and Miami International Airport (its southern terminus), and private transportation companies such as taxis, limousines, and jitneys.

### **Existing MDTA Service**

The main components of the MDTA system—Metrobus, Metrorail, and Metromover—serve nearly all of the urbanized area of the County. The County's Planning Department estimated that in 1985, 85 percent of the County's population had access to the rail and fixed-route services. The mainland core service area, those areas receiving the majority of transit service at headways of 30 minutes or less, is bounded by N.E./N.W. 79th Street on the north, N.W./S.W. 27th Avenue on the west, Coral Way on the south, and Biscayne Bay on the east. On Miami Beach, the core service area is south of 96th Street. The remainder of the urban area is served with headways that range from 30 to 60 minutes. Figure 7 shows the existing MDTA service area. It is based on a one-quarter mile distance on either side of the bus routes and guideways currently in operation. An additional component of the MDTA system is paratransit. These are specialized demand-responsive services that primarily serve the transportation disadvantaged.

The transit agency also provides three special, but regularly scheduled, services which serve a specific need within the County. They are excellent examples of the type of special services that TDM actions require to successfully mitigate traffic congestion.

- Zoo Bus, a weekend express bus service operating between the Dadeland North Metrorail Station and Metrozoo;
- Kendall Area Transit (KAT), are special service provided during the morning and evening peak hours between the residential areas of western Kendall and the Dadeland North Metrorail Station; and
- MAX, a limited route which provide service at widely spaced stops along N.W. 27th Avenue between Calder Race Track and the Martin Luther King Metrorail Station.



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**EXISTING AND FUTURE  
 METROBUS SERVICE  
 FIGURE 7**

### Taxis, Limousines, and Jitneys

Dade County Ordinance 31-101 allows one private licensed carrier for every 1,000 County residents. As of 1988 there were 1,617 licenses in use out of 1,824 available. In addition to these, within the past four years private-provided jitney services, serving specifically selected routes, have proliferated in the most heavily patronized MDTA bus service corridors in the County. All of these private providers supplement the transit services in addition to that provided by MDTA. However, many of these new private services directly compete with MDTA, so instead of supplementing MDTA, these services reduce the efficiency of the transit agency's routes.

### Planned and Committed Improvements

Planned improvements to the County's mass transit system are generally divided into two categories: bus and rapid transit. The future service area of Metrobus was prepared based on criteria related to cost, frequency, accessibility, ridership potential, and future population density. Future bus service corridors are also shown in Figure 7. Future rapid transit corridor improvements are shown in Figure 8, and are the same as the corridors that were adopted by the County in 1984. Potential service along these corridors may include heavy rail, light rail, or busways. It is anticipated that one or two of these corridors will be selected within the next year for service implementation in the next decade, with the remainder of the corridors remaining in consideration for future service expansions.

There are two committed transit improvements within the County. The first, already under construction, is the extension of Metromover to the north to Omni and south to Brickell Avenue. It is anticipated that the extensions will increase Metrorail ridership, similar to when the first phase of Metromover opened in 1986. The opening of the extensions are planned for 1994. The other committed improvement is located along the South Dixie Highway Corridor, from the southern terminus of Metrorail (at Dadeland South) to Cutler Ridge. This corridor is slated for construction as a busway facility, with concomitant express service to southwest Kendall (Countrywalk) and Saga Bay.

### **TSM FACILITIES**

The County has a number of existing transportation system management (TSM)<sup>7</sup> facilities. These are ancillary facilities that enhance the transportation system of the County—both roadway and transit. Two TSM facilities that are key to the CMP are the high-

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<sup>7</sup>For a definition and examples of TSM actions and facilities, see Barton-Aschman Associates, Inc., *Transportation Demand Management and Congestion Mitigation Study, Current Efforts in Transportation Demand Management and Tools for its Implementation in Dade County*, Metro-Dade Metropolitan Planning Organization, March 1992 pp. 2-4.



occupancy vehicle (HOV) lanes and the park-and-ride lots. These are discussed in greater detail below.

**HOV Lanes.** There is only one HOV facility currently operating within Dade County. It is located on I-95, from the Broward County line to just north of the Golden Glades interchange, and from south of the Golden Glades interchange to S.R. 112. The southern link of the HOV facility connects the Golden Glades Park-and-Ride lot with the Earlington Heights Metrorail station and downtown Miami. There are plans underway to connect the I-95 HOV lanes through the Golden Glades interchange. When this is completed, a continuous HOV lane will be provided on I-95 from southern Palm Beach County to S.R. 112 in Dade County.

**Park-and-Ride Lots.** There are a total of 32 (nine active and 23 inactive) park-and-ride lots scattered throughout the County. Fifteen of these are free-standing (not adjacent to amass transit facility) surface lots, while the balance are garages or lots adjacent to Metrorail stations. An additional 12 park-and-ride lots were presented in the June 1989 draft of the *Park-Ride Facilities Plan*. The location of all of these facilities are shown in Figure 9.

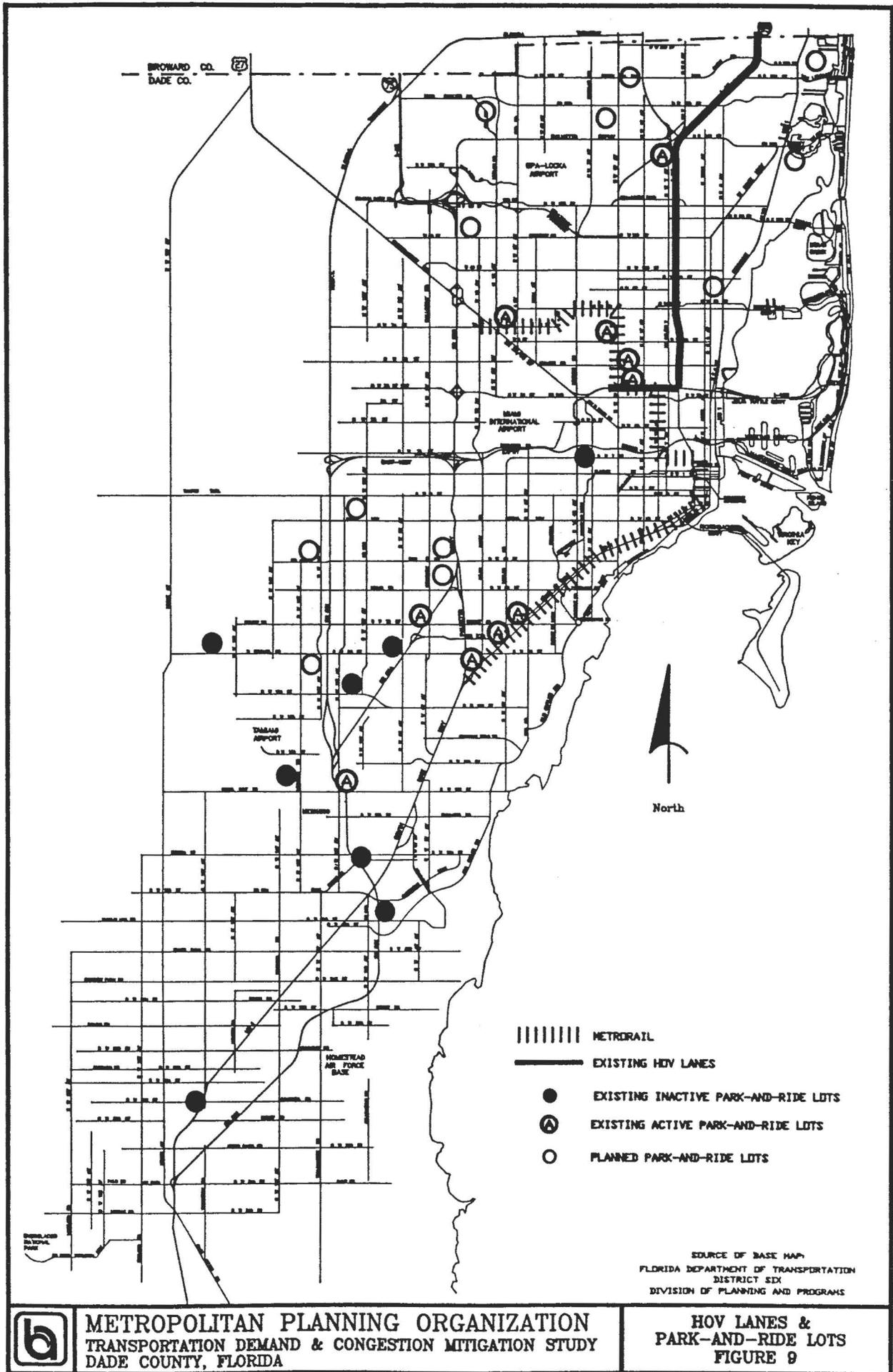
Park-and-ride facilities in Dade County generally fall into two categories, parking for express bus or Metrorail service, and convenient parking for local bus route service. Both types of facilities also provide space for use as car pool staging areas. There are four active free-standing facilities in the County, which operate at a relatively high level of success. These are the Golden Glades, Hammocks Town Center, West Lakes Plaza, and Miami-Dade Community College-South Campus. As stated in an MDTA study,<sup>8</sup> the success of these four lots can be attributed to the following factors:

- 1 Frequent Metrobus service;
- 2 Availability of alternate off-peak service;
- 3 Transit's competitive cost compared to automobile use;
- 4 Transit's competitive travel time compared to automobile use;
- 5 Clear lot identification, good, lighting, and sheltered waiting areas; and
- 6 High, visible security.

The failure of most of the inactive lots was attributed to low Metrobus frequency of service.

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<sup>8</sup>Metro-Dade Transit Agency, *Draft Park-Ride Facilities Plan*, June 1989.



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**TRANSPORTATION DEMAND & CONGESTION MITIGATION STUDY**  
**DADE COUNTY, FLORIDA**

**HOV LANES &**  
**PARK-AND-RIDE LOTS**  
**FIGURE 9**

## **MAJOR PUBLIC PARKING FACILITIES**

Parking in Dade County is generally provided in private, off-street facilities. Major commercial and employment centers provide surface or garage facilities with an amount of parking that is adequate to meet the needs of the site's land use. In some areas of the County, public parking is also provided. These are both on-street and off-street facilities, typically located in dense urban areas of the County. All of these facilities are run by the respective cities.

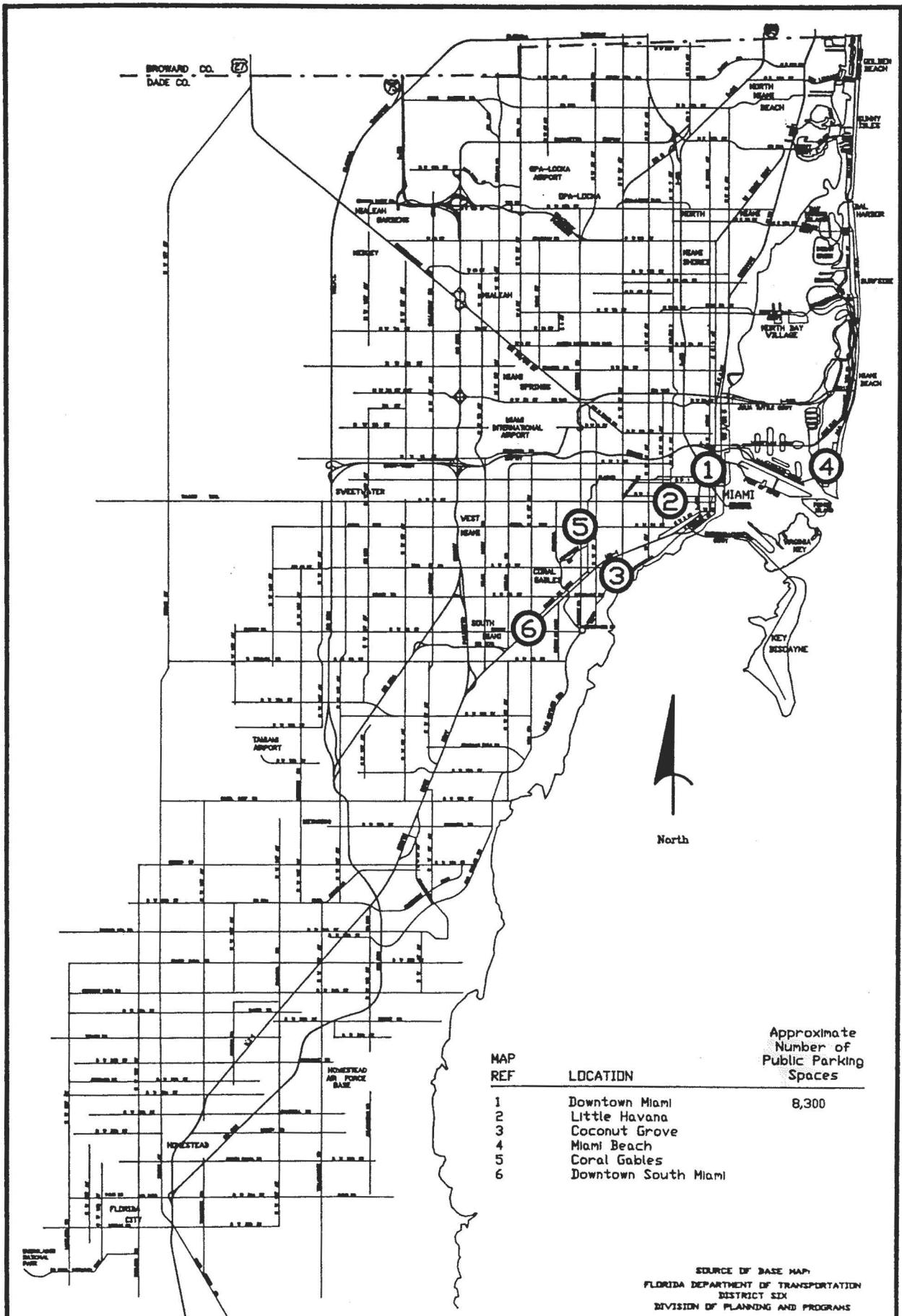
The locations of major on-street and off-street public parking facilities are illustrated in Figure 10. These areas are:

- 1 Downtown Miami;
- 2 Little Havana (S.W. 8th Street);
- 3 Coconut Grove (Business District);
- 4 Miami Beach (South Beach & Convention Center/Lincoln Road)
- 5 Coral Gables (Downtown and Business Districts); and
- 6 Downtown South Miami.

## **BICYCLE FACILITIES AND PROGRAMS**

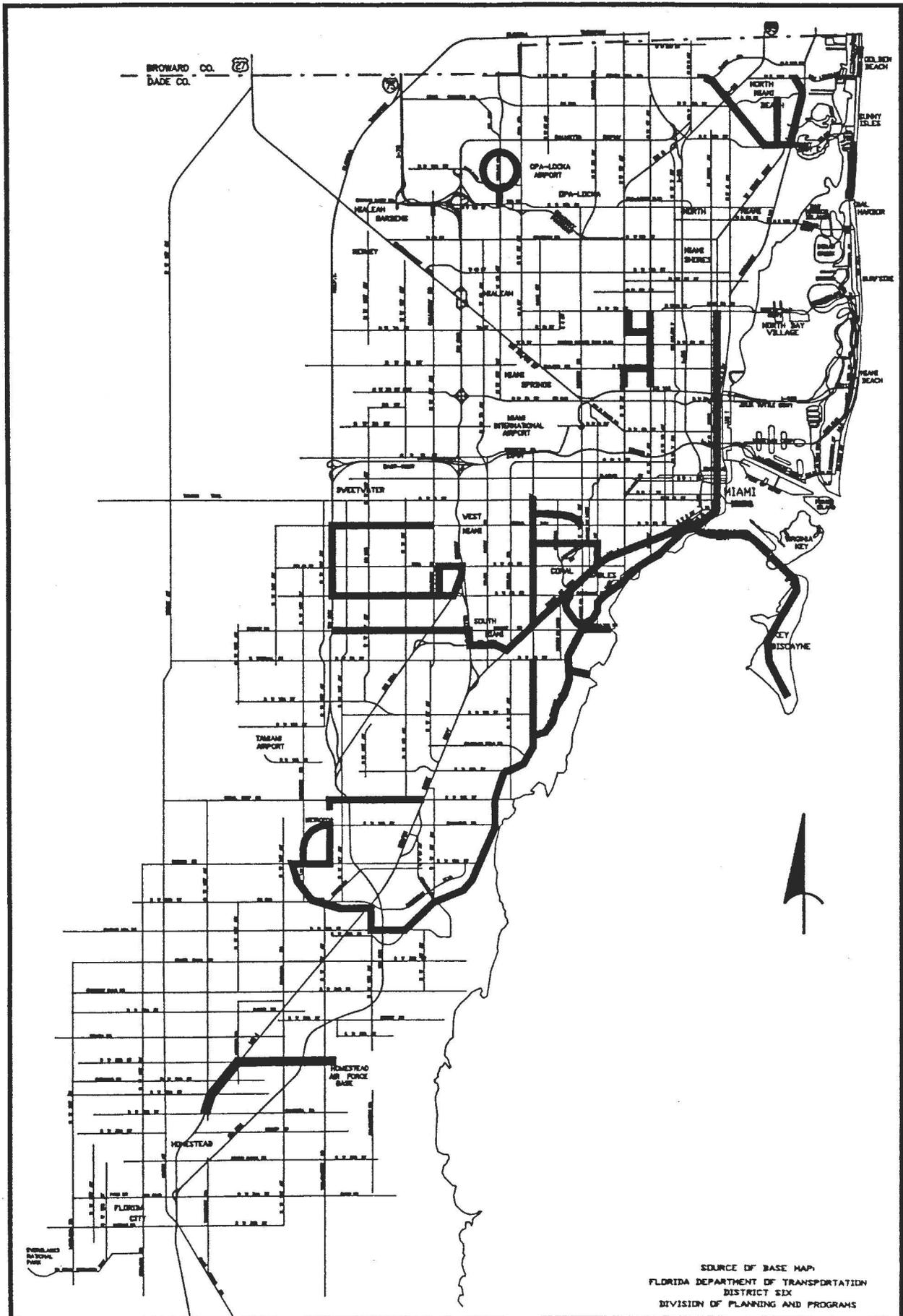
There are over 100 miles of designated bikeways within the urban area of the County. These facilities are paved and segregated from motorized traffic. There are an additional 275 miles of on-road and off-road bicycle paths throughout the County that link residential areas, employment centers, schools, shopping centers, and parks. Figure 11 illustrates the location of the major bikeways in Dade County.

In November 1986, the MPO adopted the *Metropolitan Dade County Comprehensive Bicycle Plan*, pursuant to Chapter 316.065(1)(a), F.S., expanding the role of the bicycle in transportation, and conferring it full rights to the use of the roadway system. This plan inventoried the existing bicycle facilities in Dade County. In addition to the bikeways illustrated in Figure 11, the County also offers the Bicycle-Transit Integration, a program of linking bicycles with mass transit including the "Bikes-on-Trains" program and the secure bicycle parking (bike lockers) at the Metrorail stations.



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**DADE COUNTY, FLORIDA**

**MAJOR PUBLIC PARKING**  
**FIGURE 10**



SOURCE OF BASE MAP:  
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 DADE COUNTY, FLORIDA

**MAJOR BIKEWAYS**  
**FIGURE 11**

## LAND USE

The Metro-Dade Planning Department has conducted extensive studies of existing and future land uses within the County. The purpose of these analyses has been to identify the location of major employment and activity centers. These land uses typically generate the highest traffic generation rates, particularly during the A.M. and P.M. peak travel periods. It is at these locations where TDM actions are likely to have their greatest impacts.

### Business Districts

Business districts are defined by the Metro-Dade Planning Department as urban areas, usually city cores, characterized by major concentrations of retail businesses, offices, and service establishments. There are ten major business districts in Dade County. They generally coincide with the "downtowns" of the incorporated areas of the County. These are listed below, by size in descending order. Their locations are illustrated in Figure 12.<sup>9</sup>

- |                             |                          |
|-----------------------------|--------------------------|
| 1. Downtown Miami           | 6. Downtown South Miami  |
| 2. Coconut Grove            | 7. North Miami           |
| 3. Miami Beach-Lincoln Road | 8. Hialeah-Miami Springs |
| 4. Downtown Coral Gables    | 9. Surfside-Bal Harbour  |
| 5. Homestead                | 10. North Miami Beach    |

### Employment Centers

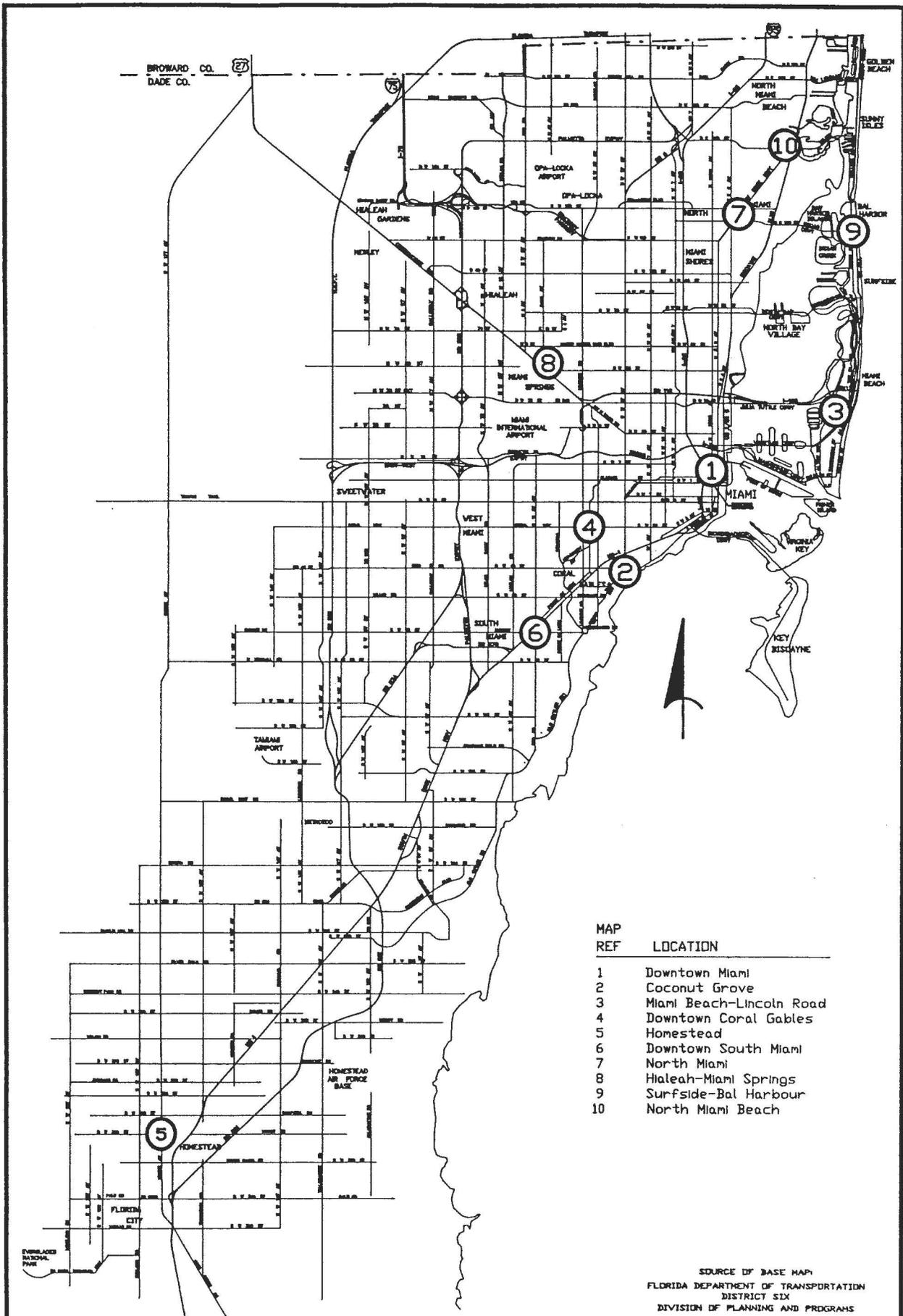
Three major types of employment centers were identified for this study: office, industrial, and institutional. These categories were selected due to their propensity to generate large numbers of employees during typical business hours. The location and intensity of each of these land uses were gathered from various sources, including the Metro-Dade Planning Department, the *South Florida Business Journal*, and the *South Florida Office Guide*. More detailed discussion of each of these land uses is presented below.

**Office.** Consistent with the suburbanization trends of the past decade, office space is scattered throughout all of Dade County. Their locations were identified within a one square mile area of the County.<sup>10</sup> Two or three—depending on the locations and their

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<sup>9</sup>Metro-Dade Planning Department, *Major Shopping Centers Information Map No. 21*, November 1984.

<sup>10</sup>The locator grid of the *South Florida Office Guide*, Winter 1992 was used.



| MAP REF | LOCATION                 |
|---------|--------------------------|
| 1       | Downtown Miami           |
| 2       | Coconut Grove            |
| 3       | Miami Beach-Lincoln Road |
| 4       | Downtown Coral Gables    |
| 5       | Homestead                |
| 6       | Downtown South Miami     |
| 7       | North Miami              |
| 8       | Hialeah-Miami Springs    |
| 9       | Surfside-Bal Harbour     |
| 10      | North Miami Beach        |

SOURCE OF BASE MAP:  
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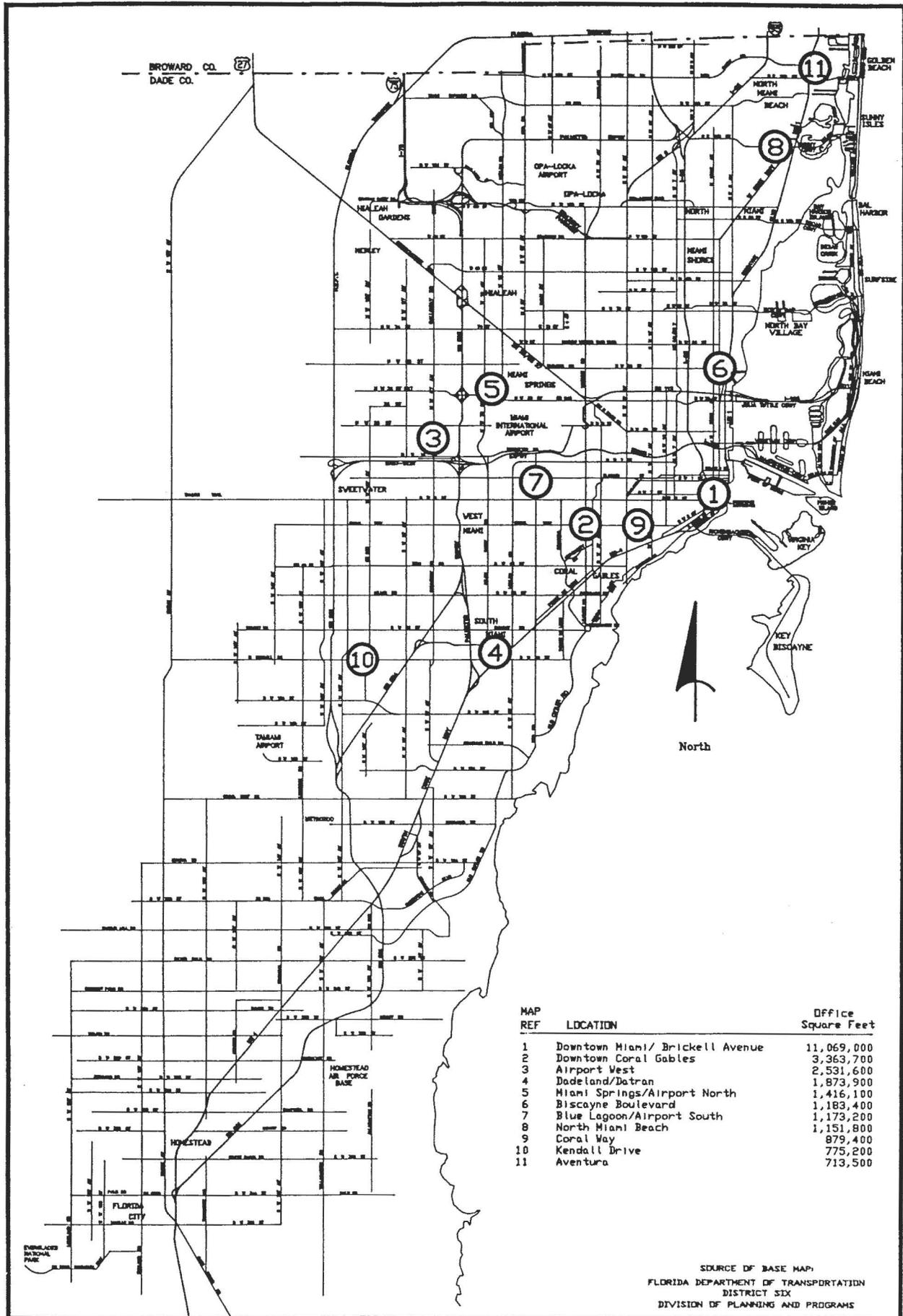
relationship to each other—of these square mile areas were then combined to determine the total office square footage of the 11 locations described below. Although each individual office location holds some potential for implementing TDM actions, studies have shown that the greatest impacts from these actions may be expected from large concentrations of office employees. Therefore concentrations of greater than 700,000 square feet over a two square mile area were mapped as areas with the greatest potential for implementation of TDM actions. These locations are listed below, and illustrated in Figure 13.

| <u>Map Reference</u> | <u>Location</u>                 | <u>Office Square Feet</u> |
|----------------------|---------------------------------|---------------------------|
| 1                    | Downtown Miami/ Brickell Avenue | 11,069,000                |
| 2                    | Downtown Coral Gables           | 3,363,700                 |
| 3                    | Airport West                    | 2,531,600                 |
| 4                    | Dadeland/Datran                 | 1,873,900                 |
| 5                    | Miami Springs/Airport North     | 1,416,100                 |
| 6                    | Biscayne Boulevard              | 1,183,400                 |
| 7                    | Blue Lagoon/Airport South       | 1,173,200                 |
| 8                    | North Miami Beach               | 1,151,800                 |
| 9                    | Coral Way                       | 879,400                   |
| 10                   | Kendall Drive                   | 775,200                   |
| 11                   | Aventura                        | 713,500                   |

**Industrial.** The locations of major business and industrial parks were identified and plotted on Figure 14. These are sites that may have a combination of office, light industrial, or wide bay warehouse uses. Due to the limitations of the available data, the floor areas for the Airport West sites may overlap with the office floor areas presented above. The remainder of the sites, however, are additional locations that include a significant number of employees—and commuter trip generation—due to their large size.

Business and industrial parks of over 500,000 square feet were selected for inclusion in this list. They are:

| <u>Map Reference</u> | <u>Location</u>                     | <u>Business/ Industrial Square Feet</u> |
|----------------------|-------------------------------------|---|
| 1                    | Sunshine State Industrial Park      | 6,500,000                               |
| 2                    | Seaboard Industrial Park            | 4,300,000                               |
| 3                    | Miami Lakes Business Park East      | 3,584,000                               |
| 4                    | Miami International Commerce Center | 3,500,000                               |
| 5                    | America's Gateway Park              | 1,600,000                               |
| 6                    | Koger Executive Center              | 1,300,000                               |
| 7                    | Miami Lakes Business Park West      | 975,000                                 |
| 8                    | Poinciana Industrial Center         | 650,000                                 |



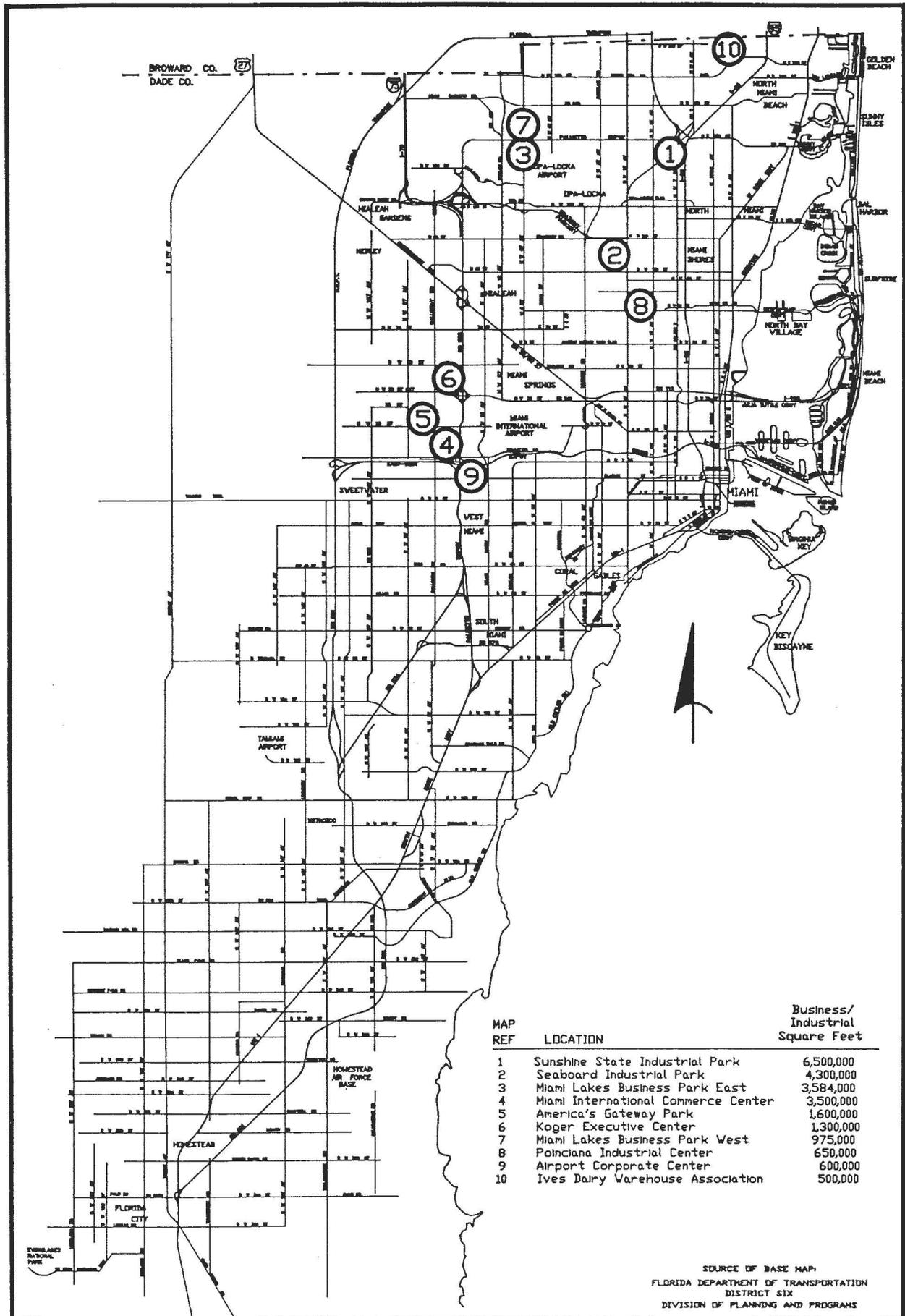
| MAP REF | LOCATION                        | Office Square Feet |
|---------|---------------------------------|--------------------|
| 1       | Downtown Miami/ Brickell Avenue | 11,069,000         |
| 2       | Downtown Coral Gables           | 3,363,700          |
| 3       | Airport West                    | 2,531,600          |
| 4       | Dadeland/Datran                 | 1,873,900          |
| 5       | Miami Springs/Airport North     | 1,416,100          |
| 6       | Biscayne Boulevard              | 1,183,400          |
| 7       | Blue Lagoon/Airport South       | 1,173,200          |
| 8       | North Miami Beach               | 1,151,800          |
| 9       | Coral Way                       | 879,400            |
| 10      | Kendall Drive                   | 775,200            |
| 11      | Aventura                        | 713,500            |

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**METROPOLITAN PLANNING ORGANIZATION**  
 TRANSPORTATION DEMAND & CONGESTION MITIGATION STUDY  
 DADE COUNTY, FLORIDA

**MAJOR OFFICE CONCENTRATIONS**  
 (>700,000sf)  
 FIGURE 13



| MAP REF | LOCATION                            | Business/Industrial Square Feet |
|---------|-------------------------------------|---------------------------------|
| 1       | Sunshine State Industrial Park      | 6,500,000                       |
| 2       | Seaboard Industrial Park            | 4,300,000                       |
| 3       | Miami Lakes Business Park East      | 3,584,000                       |
| 4       | Miami International Commerce Center | 3,500,000                       |
| 5       | America's Gateway Park              | 1,600,000                       |
| 6       | Koger Executive Center              | 1,300,000                       |
| 7       | Miami Lakes Business Park West      | 975,000                         |
| 8       | Polcliana Industrial Center         | 650,000                         |
| 9       | Airport Corporate Center            | 600,000                         |
| 10      | Ives Dairy Warehouse Association    | 500,000                         |

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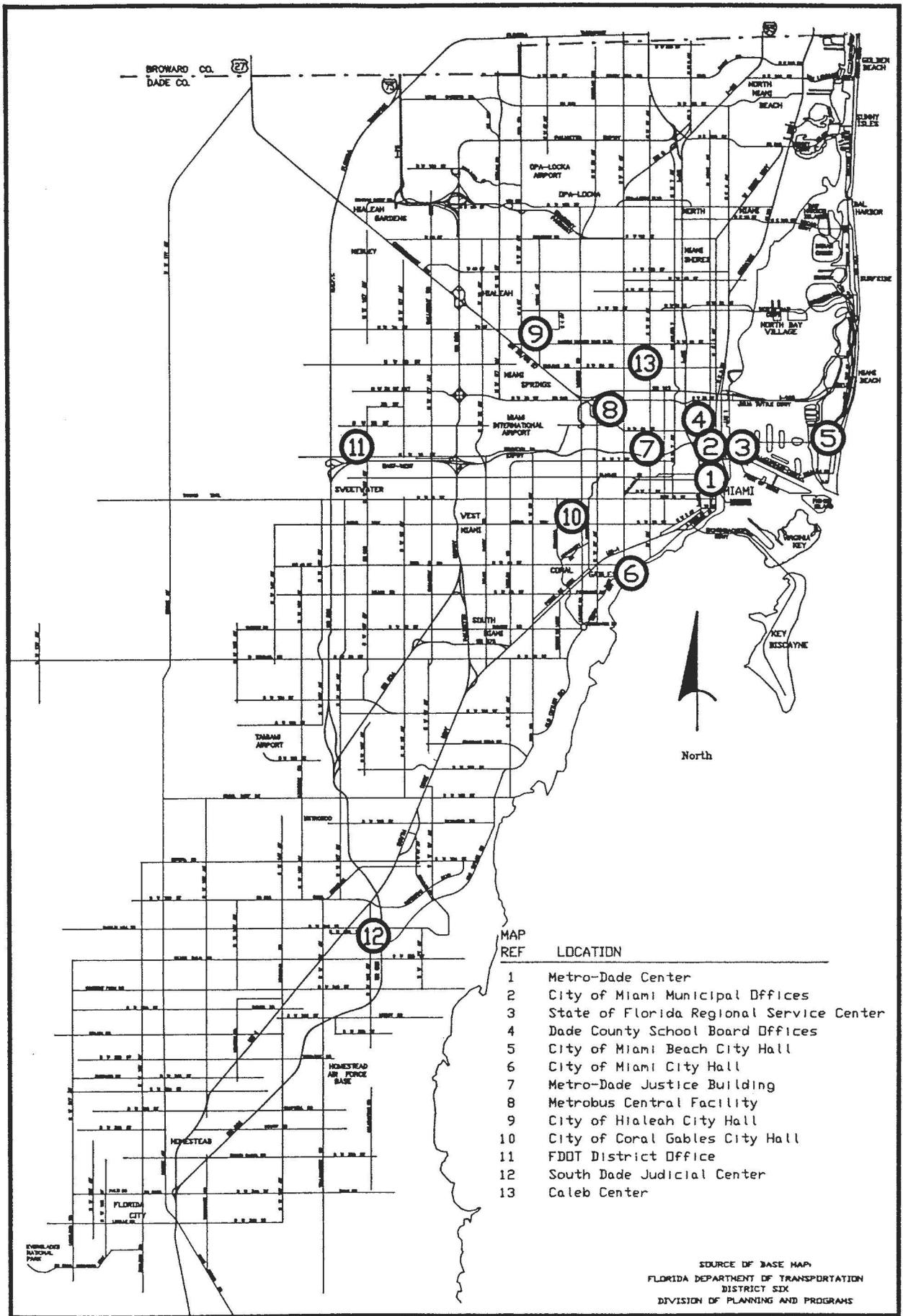
| <u>Map Reference</u> | <u>Location</u>                  | <u>Business/ Industrial Square Feet</u> |
|----------------------|----------------------------------|---|
| 9                    | Airport Corporate Center         | 600,000                                 |
| 10                   | Ives Dairy Warehouse Association | 500,000                                 |

**Institutional.** Three types of institutional land uses are illustrated in Figures 15, 16, and 17: government centers, colleges and universities, and hospitals and medical centers, respectively. Government land uses include those government offices (federal, state, county, or local) in which a large number of employees are concentrated. These locations include the Metro-Dade Center, the Florida Department of Transportation District Office, and the Metro Justice Building. The six local institutions (housed in ten campuses throughout the County) of higher learning were included in the schools category, and all of the major hospitals were included in the medical center category. These land uses generate a tremendous amount of daily commuter travel. For TDM purposes, the occupying organizations have the added advantage of having control over a large employment base. As such, they make excellent candidates for the implementation of TDM actions. A complete list of the land uses illustrated in the Figures are tabulated below.

| <u>Map Reference</u> | <u>Government Centers</u>                |
|----------------------|--|
| 1                    | Metro-Dade Center                        |
| 2                    | City of Miami Municipal Offices          |
| 3                    | State of Florida Regional Service Center |
| 4                    | Dade County School Board Offices         |
| 5                    | City of Miami Beach City Hall            |
| 6                    | City of Miami City Hall                  |
| 7                    | Metro-Dade Justice Building              |
| 8                    | Metrobus Central Facility                |
| 9                    | City of Hialeah City Hall                |
| 10                   | City of Coral Gables City Hall           |
| 11                   | FDOT District Office                     |
| 12                   | South Dade Judicial Center               |
| 13                   | Caleb Center                             |

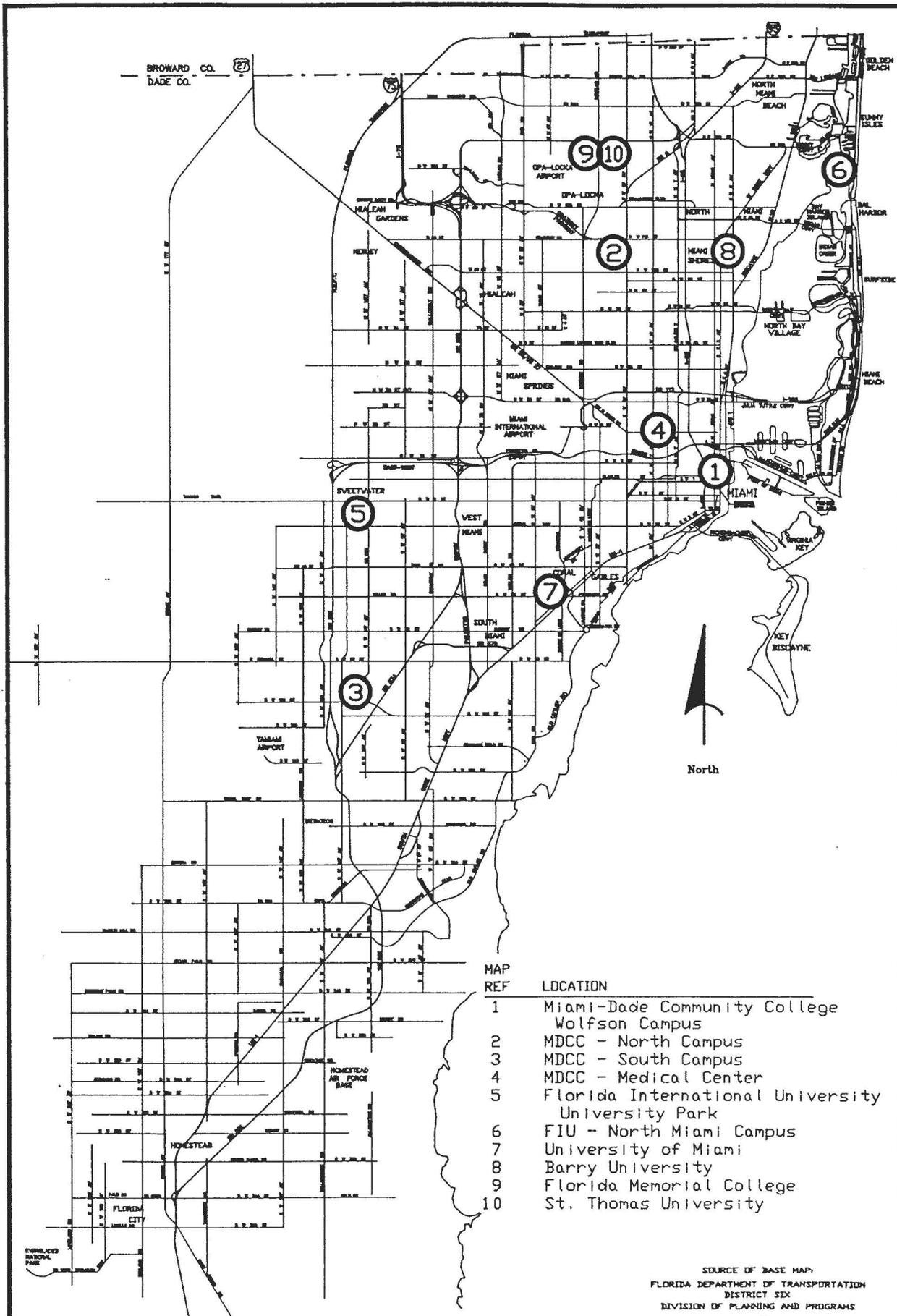
#### Colleges and Universities

|   |  |
|---|--|
| 1 | Miami-Dade Community College - Wolfson Campus      |
| 2 | MDCC - North Campus                                |
| 3 | MDCC - South Campus                                |
| 4 | MDCC - Medical Center                              |
| 5 | Florida International University - University Park |



| MAP REF | LOCATION                                 |
|---------|--|
| 1       | Metro-Dade Center                        |
| 2       | City of Miami Municipal Offices          |
| 3       | State of Florida Regional Service Center |
| 4       | Dade County School Board Offices         |
| 5       | City of Miami Beach City Hall            |
| 6       | City of Miami City Hall                  |
| 7       | Metro-Dade Justice Building              |
| 8       | Metrobus Central Facility                |
| 9       | City of Hialeah City Hall                |
| 10      | City of Coral Gables City Hall           |
| 11      | FDOT District Office                     |
| 12      | South Dade Judicial Center               |
| 13      | Caleb Center                             |

SOURCE OF BASE MAP  
 FLORIDA DEPARTMENT OF TRANSPORTATION  
 DISTRICT SIX  
 DIVISION OF PLANNING AND PROGRAMS



Map  
Reference

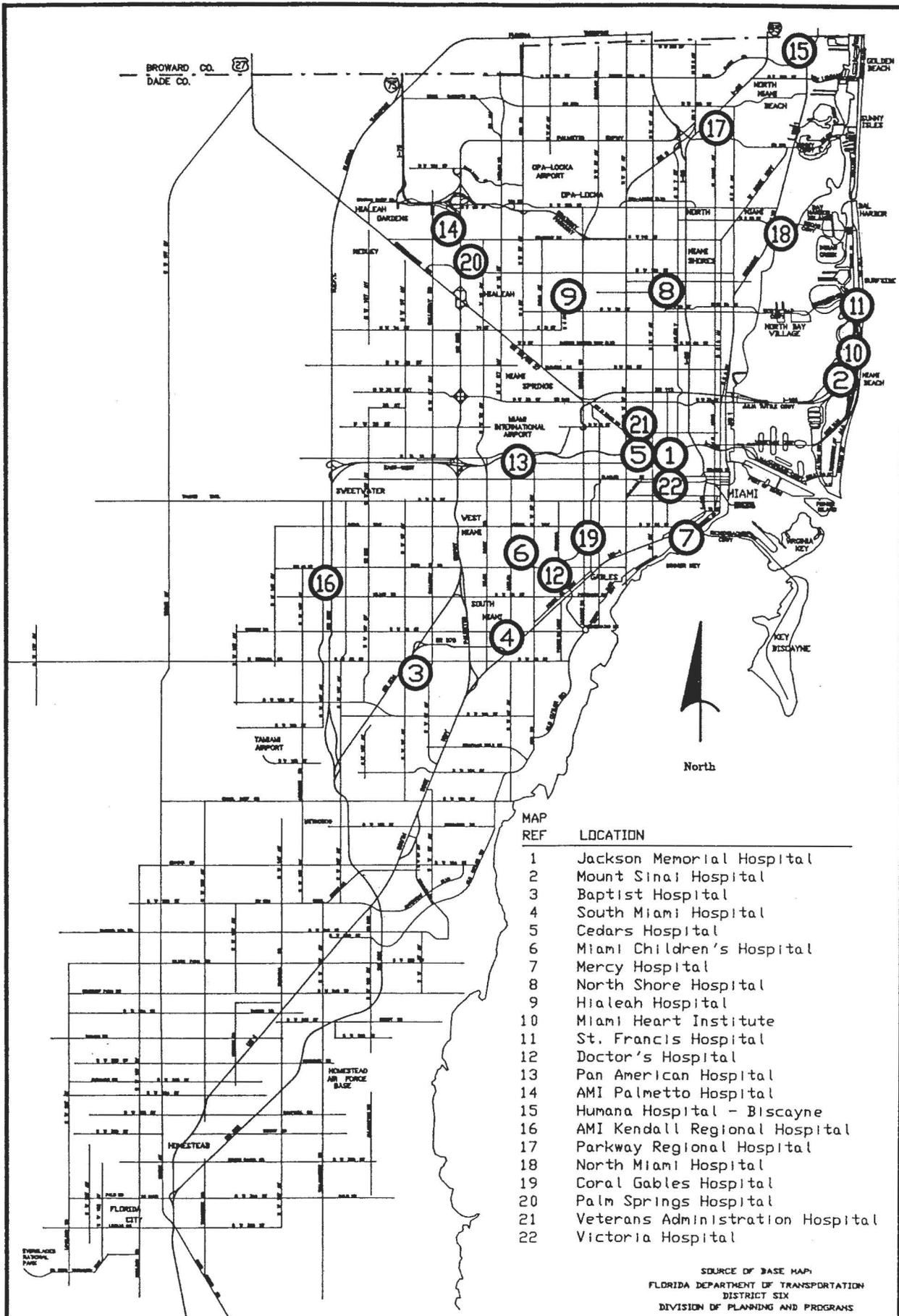
Colleges and Universities

|    |                          |
|----|--------------------------|
| 6  | FIU - North Miami Campus |
| 7  | University of Miami      |
| 8  | Barry University         |
| 9  | Florida Memorial College |
| 10 | St. Thomas University    |

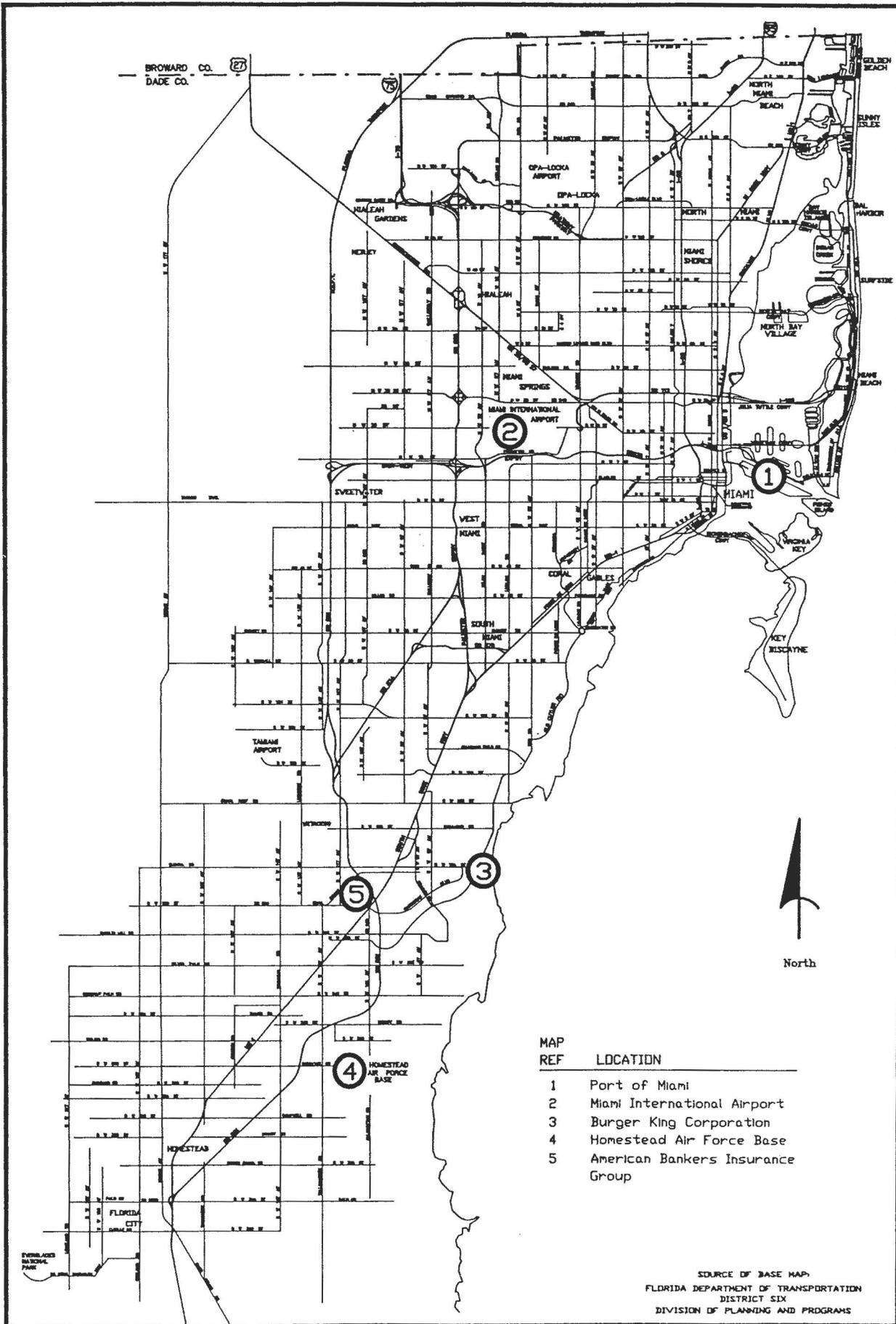
Hospitals and Medical Centers

|    |                                  |
|----|----------------------------------|
| 1  | Jackson Memorial Hospital        |
| 2  | Mount Sinai Hospital             |
| 3  | Baptist Hospital                 |
| 4  | South Miami Hospital             |
| 5  | Cedars Hospital                  |
| 6  | Miami Children's Hospital        |
| 7  | Mercy Hospital                   |
| 8  | North Shore Hospital             |
| 9  | Hialeah Hospital                 |
| 10 | Miami Heart Institute            |
| 11 | St. Francis Hospital             |
| 12 | Doctor's Hospital                |
| 13 | Pan American Hospital            |
| 14 | AMI Palmetto Hospital            |
| 15 | Humana Hospital - Biscayne       |
| 16 | AMI Kendall Regional Hospital    |
| 17 | Parkway Regional Hospital        |
| 18 | North Miami Hospital             |
| 19 | Coral Gables Hospital            |
| 20 | Palm Springs Hospital            |
| 21 | Veterans Administration Hospital |
| 22 | Victoria Hospital                |

**Other Employment Centers.** There are other employment centers in the county that are not easily classified into the categories listed above, but that are nonetheless good candidates for the implementation of TDM actions. These include locations such as Miami International Airport, the Port of Miami, Homestead Air Force Base, and the American Bankers Insurance Group and the Burger King Corporate Headquarters. Their locations are illustrated in Figure 18.



SOURCE OF BASE MAP:  
 FLORIDA DEPARTMENT OF TRANSPORTATION  
 DISTRICT SIX  
 DIVISION OF PLANNING AND PROGRAMS



| MAP REF | LOCATION                         |
|---------|----------------------------------|
| 1       | Port of Miami                    |
| 2       | Miami International Airport      |
| 3       | Burger King Corporation          |
| 4       | Homestead Air Force Base         |
| 5       | American Bankers Insurance Group |

SOURCE OF BASE MAP:  
 FLORIDA DEPARTMENT OF TRANSPORTATION  
 DISTRICT SIX  
 DIVISION OF PLANNING AND PROGRAMS

## SUMMARY AND CONCLUSIONS

Dade County has an extensive transportation network which serves virtually all of the urbanized area. The network is comprised of roadways, mass transit, and specialized services. It is required to serve a vast urban area that, by its development pattern, is heavily dependent on the private automobile. The County has continued its on-going process of planning for its existing and future transportation needs, however, even the *Long-Range Transportation Plan* states that in many instances the County's LOS standards are not fully met because of physical, operational, legislative, and other constraints. And it must be noted that within the Urban Infill Area (UIA) of the County, the LOS standard is already well into congested conditions.

As a summary to the existing conditions section of this plan, an analysis of transportation services versus land use is presented. The purpose of this analysis is to provide a summary of the information presented and conclusions related to the applicability of TDM actions to Dade County.

### Congested Roadways Versus Other Transportation Facilities

The majority of the roadway congestion in Dade County occurs within the UIA. This, not coincidentally, is also the core service area for MDTA. The good point of this is that commuters are offered an option in the most congested areas of the County. The negative is that the buses have to operate on these congested facilities. Congested roadways which are not located within the MDTA core service area are listed below. Also noted in the list are those roadways which have a major bikeway adjacent to them, and those which serve County TSM facilities.

| <u>Roadway</u>      | <u>Congested Segment Outside of the MDTA Core Service Area</u>                  |
|---------------------|---|
| Miami Gardens Drive | Florida Turnpike to west of N.E. 6th Avenue                                     |
| N.W. 135th Street   | N.W. 27th Avenue to North Miami Avenue  |
| N.E. 123rd Street   | N.E. 6th Avenue to Biscayne Boulevard   |
| N.W. 103rd Street   | Palmetto Expressway to N.W. 37th Avenue   |
| N.W. 58th Street    | N.W. 97th Avenue to Palmetto Expressway   |
| N.W. 36th Street    | N.W. 107th Avenue to N.W. 87th Avenue &<br>N.W. 72nd Avenue to N.W. 37th Avenue |
| N.W. 25th Street    | N.W. 97th Avenue to N.W. 72nd Avenue  |
| Dolphin Expressway  | N.W. 97th Avenue to N.W. 42nd Avenue@   |
| Flagler Street      | Palmetto Expressway to N.W. 57th Avenue   |
| S.W. 8th Street     | N.W. 97th Avenue to N.W. 22nd Avenue@   |
| Coral Way           | S.W. 67th Avenue to S.W. 27th Avenue  |

@Roadway segment near an existing (active or inactive) or planned park-and-ride lot.

\*Roadway segment at least partially served by a major bikeway.

| <u>Roadway</u>      | <u>Congested Segment Outside of the MDTA Core Service Area</u>  |
|---------------------|---|
| Bird Road           | S.W. 137th Avenue to H.E.F.T.* &<br>S.W. 107th Avenue to S.W. 87th Avenue* &<br>Palmetto Expressway to S.W. 72nd Avenue &<br>N.W. 57th Avenue to S.W. 42nd Avenue           |
| North Kendall Drive | S.W. 137th Avenue to S.W. 122nd Avenue*   |
| Coral Reef Drive    | S.W. 137th Avenue to S.W. 127th Avenue* &<br>South Dixie Highway to S.W. 87th Avenue  |
| Richmond Drive      | S.W. 107th Avenue to South Dixie Highway &<br>East of S.W. 87th Avenue*   |
| Eureka Drive        | South Dixie Highway to Caribbean Boulevard  |
| Quail Roost Drive   | S.W. 127th Avenue to S.W. 107th Avenue*   |
| Hanlin Mill Road    | S.W. 137th Avenue to South Dixie Highway*   |
| Coconut Palm Drive  | Krome Avenue to South Dixie Highway   |
| S.W. 268th Street   | S.W. 147th Avenue to S.W. 137th Avenue  |
| Biscayne Drive      | Krome Avenue to H.E.F.T.  |
| S.W. 137th Avenue   | Sunset Drive to Coral Reef Drive*   |
| S.W. 127th Avenue   | S.W. 8th Street to Bird Road*   |
| S.W. 117th Avenue   | S.W. 104th Street to Richmond Drive*  |
| S.W. 107th Avenue   | At the Dolphin Expressway Interchange &<br>S.W. 8th Street to Bird Road*  |
| S.W. 97th Avenue    | S.W. 8th Street to Miller Drive &<br>Don Shula Expressway to S.W. 120th Street*   |
| South Dixie Highway | I-95 to Eureka Drive* <sup>@</sup>  |
| Palmetto Expressway | I-75 to N.W. 103rd Street &<br>At the Dolphin Expressway Interchange &<br>Bird Road to Miller Drive   |
| Okeechobee Road     | N.W. 87th Avenue to Hialeah Drive*  |
| N.W. 72nd Avenue    | Miami Lakes Drive to N.W. 103rd Street*   |
| N.W. 67th Avenue    | Broward County line to Palmetto Expressway* <sup>@</sup> &<br>I-75 to N.W. 103rd Street &<br>S.W. 8th Street to Sunset Drive &<br>South Dixie Highway to S.W. 104th Street* |
| N.W. 57th Avenue    | Palmetto Expressway to Miami Lakes Drive &<br>N.W. 103rd Street to N.W. 74th Street &<br>S.W. 8th Street to Bird Road*  |
| West 4th Avenue     | West 49th Street to West 21st Street  |
| N.W. 47th Avenue    | Broward County line to Miami Gardens Drive  |

<sup>@</sup>Roadway segment near an existing (active or inactive) or planned park-and-ride lot.

\*Roadway segment at least partially served by a major bikeway.

| <u>Roadway</u>     | <u>Congested Segment Outside of the MDTA Core Service Area</u>                           |
|--------------------|--|
| N.W. 42nd Avenue   | N.W. 103rd Street to Flagler Street <sup>@</sup> &<br>S.W. 8th Street to Old Cutler Road |
| Old Cutler Road    | N.W. 27th Avenue to Hanlin Mill Road*  |
| N.W. 17th Avenue   | N.W. 119th Street to N.W. 95th Street  |
| N.W. 2nd Avenue    | Miami Gardens Drive to Golden Glades Interchange <sup>@</sup>                            |
| Biscayne Boulevard | Broward County line to N.E. 79th Street* <sup>@</sup>                                    |

<sup>@</sup>Roadway segment near an existing (active or inactive) or planned park-and-ride lot.

\*Roadway segment at least partially served by a major bikeway.

### Employment Centers Versus Transportation Facilities

The majority of the employment centers in Dade County are located outside of MDTA's core service area. In fact, many of the large office and industrial concentrations are located at the fringe of the overall MDTA service area. As a result, many of these employment centers are also located on congested roadways. The following list compares the employment center's location relative to its location to MDTA service, congested roadway facilities, and major public parking facilities.

Those employment centers near congested roadways comprise many of the best candidates for TDM actions because motorists may be more interested in commute alternatives less impacted by congestion. The additional information related to proximity to the MDTA service core and public parking facilities may be used to refine the proposals for the types of TDM actions that candidate employment centers will have.

| <u>Employment Center</u>        | <u>Within MDTA Service Core</u> | <u>Near Congested Roadways</u> | <u>Near Public Parking</u> |
|---------------------------------|---------------------------------|--------------------------------|----------------------------|
| <b>O F F I C E</b>              |                                 |                                |                            |
| Downtown Miami/ Brickell Avenue | X                               | X                              | X                          |
| Downtown Coral Gables           |                                 | X                              | X                          |
| Airport West                    |                                 | X                              |                            |
| Dadeland/Datran                 |                                 | X                              | X                          |
| Miami Springs/Airport North     |                                 | X                              |                            |
| Biscayne Boulevard              | X                               | X                              |                            |
| Blue Lagoon/Airport South       |                                 | X                              |                            |
| North Miami Beach               |                                 | X                              |                            |
| Coral Way                       | X                               | X                              | X                          |
| Kendall Drive                   |                                 | X                              |                            |
| Aventura                        |                                 | X                              |                            |

| <u>Employment Center</u> | <u>Within MDTA<br/>Service Core</u> | <u>Near Congested<br/>Roadways</u> | <u>Near Public<br/>Parking</u> |
|--------------------------|-------------------------------------|------------------------------------|--------------------------------|
|--------------------------|-------------------------------------|------------------------------------|--------------------------------|

**B U S I N E S S / I N D U S T R I A L**

|                                     |  |   |  |
|-------------------------------------|--|---|--|
| Sunshine State Industrial Park      |  | X |  |
| Seaboard Industrial Park            |  |   |  |
| Miami Lakes Business Park East      |  | X |  |
| Miami International Commerce Center |  | X |  |
| America's Gateway Park              |  | X |  |
| Koger Executive Center              |  | X |  |
| Miami Lakes Business Park West      |  | X |  |

**G O V E R N M E N T**

|  |   |   |   |
|--|---|---|---|
| Metro-Dade Center                        | X | X | X |
| City of Miami Municipal Offices          | X | X | X |
| State of Florida Regional Service Center | X | X | X |
| Dade County School Board Offices         | X |   | X |
| City of Miami Beach City Hall            | X |   | X |
| City of Miami City Hall                  | X | X | X |
| Metro-Dade Justice Building              | X |   | X |
| Metrobus Central Facility                |   |   |   |
| City of Hialeah City Hall                |   | X |   |
| City of Coral Gables City Hall           |   | X | X |
| FDOT District Office                     |   |   |   |
| South Dade Judicial Center               |   | X |   |
| Caleb Center                             |   |   |   |

**E D U C A T I O N**

|                          |   |   |   |
|--------------------------|---|---|---|
| MDCC - Wolfson Campus    | X | X | X |
| MDCC - North Campus      |   | X |   |
| MDCC - South Campus      |   |   |   |
| MDCC - Medical Center    | X |   | X |
| FIU - University Park    |   | X |   |
| FIU - North Miami Campus |   | X |   |
| University of Miami      |   | X | X |
| Barry University         |   | X |   |
| Florida Memorial College |   |   |   |
| St. Thomas University    |   |   |   |

| <u>Employment Center</u> | <u>Within MDTA Service Core</u> | <u>Near Congested Roadways</u> | <u>Near Public Parking</u> |
|--------------------------|---------------------------------|--------------------------------|----------------------------|
|--------------------------|---------------------------------|--------------------------------|----------------------------|

**M E D I C A L**

|                                  |   |   |   |
|----------------------------------|---|---|---|
| Jackson Memorial Hospital        | X |   | X |
| Mount Sinai Hospital             | X |   |   |
| Baptist Hospital                 |   |   |   |
| South Miami Hospital             |   | X | X |
| Cedars Hospital                  | X |   | X |
| Miami Children's Hospital        |   | X |   |
| Mercy Hospital                   | X | X |   |
| North Shore Hospital             |   |   |   |
| Hialeah Hospital                 |   | X |   |
| Miami Heart Institute            | X |   |   |
| St. Francis Hospital             | X |   |   |
| Doctor's Hospital                |   | X |   |
| Pan American Hospital            |   | X |   |
| AMI Palmetto Hospital            |   | X |   |
| Humana Hospital - Biscayne       |   | X |   |
| AMI Kendall Regional Hospital    |   | X |   |
| Parkway Regional Hospital        |   |   |   |
| North Miami Hospital             |   | X |   |
| Coral Gables Hospital            |   | X | X |
| Palm Springs Hospital            |   | X |   |
| Veterans Administration Hospital | X | X | X |
| Victoria Hospital                | X | X |   |

**O T H E R**

|                                    |   |   |   |
|------------------------------------|---|---|---|
| Miami International Airport        |   | X | X |
| Port of Miami                      | X |   | X |
| Homestead Air Force Base           |   | X |   |
| American Bankers Insurance Group   |   |   |   |
| Burger King Corporate Headquarters |   | X |   |

#### **4.**

### **RECOMMENDED TDM OPTIONS FOR DADE COUNTY**

Transportation demand management strategies are aimed at relieving vehicular congestion, enhancing air quality, and promoting energy conservation. The first task of this study was to research the state-of-the-art in TDM actions. The result of that effort was a compilation of TDM tools that are available to the County, and a discussion of ways in which to implement them. These tools are generally designed to reduce the peak-period and/ or daily vehicular demand on the roadway portion of the transportation system by focusing on the single-occupant vehicle (SOV).

This chapter describes the TDM actions that are most appropriate for implementation in Dade County. They are grouped into three major categories: TDM actions directed at existing trips; TDM actions directed at new trips; and complimentary actions required to make the CMP a success. As previously stated, existing trips are those which are already on the road, generated by existing employment centers. New trips are those that will be generated by new development which is proposed, but not yet built. Complimentary actions—although not TDM actions in and of themselves—are support mechanisms created to assist in the implementation, marketing, and sustenance of the TDM actions.

The proposed TDM actions directed at existing trips are further segregated into low cost and long-term actions. Low cost actions are those which can be implemented immediately at low to moderate capital costs. Long-term actions are those which may require additional study or a greater capital investment. Complimentary actions, by their nature, are implementable—and potentially required—throughout the life of the County's entire TDM program.

Prior to proceeding with a description of potential TDM actions for Dade County, it should be noted that recent studies have shown that where major TDM efforts have been undertaken on a site-specific basis, a reduction of up to 15 percent in peak period traffic has been effected. Greater reductions have been achieved when TDM techniques have been implemented at some single-employer sites. The data also suggest that in order to be this effective, TDM programs must be well conceived and aggressively marketed.

To date, improvements in system-wide congestion due to TDM actions have ranged from negligible to a one to two percent reduction in peak hour traffic volumes. While the potential magnitude of TDM program impacts is yet unknown, TDM actions are not a substitute for the continued planning and implementation of improvements to the County's multi-modal transportation system. They are simply an enhancement to the system aimed at making it work more efficiently.

## LOW COST ACTIONS DIRECTED AT EXISTING TRIPS

There are five proposed low cost TDM actions which are directed at reducing the existing demand on the County's roadway system. These are actions that can be undertaken immediately, many of which are already underway, at a relatively low capital cost. Each is briefly described below.

### Carpool Programs

Carpool programs are a TDM action that can be implemented immediately at a low capital cost. Such programs are already in place in some locations in Dade County. This action involves promoting the sharing of commuter trips by two or more persons. Carpool programs are most frequently implemented at large employment centers or large residential developments, where a large pool of commuters can be drawn from, both at the destination (employment) or origin (residence) of the commute trips. Carpooling has the greatest potential of any TDM technique to reduce vehicle trip making.

Carpooling may be done informally through the use of bulletin boards at the employment center or by word of mouth. However, greater success will be achieved through the use of more formalized methods which may include the use of computerized matching of riders based on their origins and destinations, aggressive marketing of the program, and employee incentives for participating in the program. Such incentives may include subsidized and preferential parking, flextime schedules to facilitate carpooling, and matching services. Matching and marketing services are already available to Dade County through Gold Coast Commuter Services (GCCS), the Regional Commuter Assistance Provider.

The requirements for implementing carpool programs are as follows.

**Policy/Regulation.** Strong promotion of the program is required at the start and throughout its life. Promotion should be done both at the countywide level, to induce employment centers and residential areas to participate, and at the micro-level, encouraging individuals to participate in the program. Carpool programs, particularly the experience in Dade County, can be run successfully without an ordinance or regulation requiring participation in them. However, experience in California shows that participation in these programs will be far greater if mandated by law. Therefore, if an ordinance related to congestion management is adopted in Dade County, carpooling would be one of the actions required under it.

**Funding.** The FDOT funds the Regional Commuter Assistance Program (GCCS) which provides computerized carpool matching services to the region comprised of Dade, Broward, and Palm Beach Counties. Additional funding, most likely from the state or the county, is recommended to further enhance and expand the development and production of marketing/ promotional collateral material to educate commuters about the benefits of carpooling and alternative modes of transportation which should be coordinated with

ongoing and future GCCS collateral production efforts. These programs will be marketed to specific employers, large residential developments, or TMAs, who wish to undertake this action on their own. Once a carpool program is in place, employers, resident associations, or TMAs will bear the costs of providing a part-time transportation coordinator.

**Implementation Strategy.** The GCCS Program was created in 1988 by FDOT as the Regional Commuter Assistance program for the south Florida region. Prior to GCCS taking on all of the responsibility for carpool matching and marketing, MDTA's Share-a-Ride Program was already in place but operating with limited success.

Implementation of carpooling through the County's Congestion Management Program will require an ongoing, expanded, and coordinated education and marketing effort through GCCS and the County to civic organizations, area employers, schools, office park managers, and TMA members. During the first GCCS phase, related to the I-95 construction project in the tri-county area from 1988 to September 1991, GCCS marketing staff met with more than 150 employers along the I-95 corridor and entered more than 28,000 names into the POOLMATCH database system. Actual contact with candidate carpoolers should be made by representatives of major employers, resident associations, or a development (or employee) transportation coordinator. These people will be most effective in actually getting the carpools initiated. Major employers and resident associations must adopt and publicly (and actively) support and promote carpooling to gain desired results. It needs to be made an accepted and popular approach to travelling to work. Carpooling may be used in combination with such driving disincentives (for SOVs) as increased parking costs or reduced parking space availability.

#### **Subsidized or Reduced Transit Costs**

Dade County has already invested heavily in mass transit facilities, rolling stock, and operations. The key now is to maximize the efficiency of the system by having more commuters use it. One way to make transit more appealing to commuters is to subsidize its use. Commuters who are provided with subsidized parking at the employment site have difficulty comparing the relative costs of transit versus private automobile use. By subsidizing transit, commuters are enticed to use the service. Studies have shown that transit costs have an elasticity of about -0.3, meaning that for every one percent in the reduction of transit costs, a 0.3 percent increase in ridership can be expected.<sup>11</sup>

Subsidized transit costs for commuters can be implemented either through the reduction of transit fares by MDTA or through direct subsidies from employers. MDTA provides discounts for group purchases as small as five participants. Additional discounts are also provided to senior citizens and students. A combination of both could further entice ridership, by MDTA providing regularly discounted monthly transit passes to

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<sup>11</sup>FHCSA, *Traveler Response to Transportation System Changes*, 2nd ed., July 1981, p. 238.

employers in bulk and employers offering these to their employees at an additional discount. Implementation of this type of program in other areas have usually provided a 50 percent discount to the employees (25 percent from the transit agency and 25 percent from the employer).

The requirements for implementing subsidized or reduced transit cost programs are as follows.

**Policy/Regulation.** To entice large-scale employer participation, MDTA should market reduced transit fares for commuters by continuing to provide discounts for bulk purchases of monthly passes. Discounts should be marketed in conjunction with other programs, such as further discounts by the employer, producing a substantial transit subsidy for the employee.

**Funding.** Funding for this program would be shared between the County and private employers. The County already provides funding through its group fare discount program. Matching funds may be available from the Federal Transit Administration (FTA) for the implementation of this type of program through ISTEA.

**Implementation Strategy.** This action should be aggressively marketed to employers as an economic benefit to them and a fringe benefit to their employees. Employers are sometimes reluctant to cover the employee travel costs, yet are willing to subsidize parking, usually at 100 percent of the cost. By showing how subsidizing transit can be less expensive, the employers will frequently be enticed into participating in the program. It is probable that employers located in central business districts and other high density locations will be more willing to trade parking for transit than those who are located in suburban or exurban locations. Employees will increase their participation once their parking subsidies are traded for transit subsidies, and the advantages of using mass transit over SOVs are explained. Other actions which can be used to support this TDM technique are flextime (definition and discussion of this action appears later in this document), to facilitate meeting transit schedules, reduced parking availability, and increased parking prices.

### **Vanpool Programs**

Vanpool programs are similar to carpool programs, in that a group of people share a single vehicle—in this case a 10 to 15-passenger van—for their commute to work. Because of the costs associated with maintenance, administration, and insurance for operating vanpools, these programs are typically used by large employers who have employees with one-way commutes in excess of 30 minutes.

The requirements for implementing vanpool programs are as follows.

**Policy/Regulation.** Vanpools can be organized and provided by private employers, third party providers, resident associations, developers/building managers, TMAs or the local

government. If private employers or third parties are used, the only policy required of the County is marketing the benefits of the program. If the County establishes a program of providing the vans, which can substantially reduce the costs associated with the program, then through MDTA, FDOT, GCCS, or a TMA, the County would need to set up the program details such as acquiring the vans, marketing and administering the program.<sup>12</sup>

**Funding.** Funding for this program is usually the responsibility of the van users. The monthly costs associated with maintenance, insurance, and fuel (typically in the range of \$350-\$500 per month), are normally divided among the van riders. Subsidies for these costs may be provided by the program sponsor and/or the County. In existing programs, sponsors often participate by providing the vehicle, while riders cover the operating and maintenance costs. Matching funds may be available from the FTA for the implementation of this type of program.

**Implementation Strategy.** This action needs to be aggressively marketed to large employers. A vanpool program may become the outgrowth of a carpool matching study by GCCS at a large employer. An example may be a Dade County employer with a large number of employees who live in Broward County. This action can be marketed as an economic benefit to employees if it can be shown that the costs of vanpooling are significantly less than driving alone. Employers may also benefit by being able to reduce parking provisions by six to ten spaces (or more) per van. Provision of preferred on-site parking for the vanpools, flexibility in work schedules, increased parking cost, and reduced parking space availability for SOVs, are other implementation strategies that may provide additional incentives for employee's use of vanpools.

#### **Increased Use of Park-and-Ride Lots**

Park-and-ride lots have been a mainstay of TSM/TDM techniques since their inception 30 years ago. As previously discussed, in Dade County park-and-ride lots are generally small parking lots (except of course for the Golden Glades lot) intended as part of a transit terminal or transfer facility for people who choose to walk or drive to them. Many of the existing park-and-ride facilities in Dade County are currently inactive due to a lack of transit service to them. However, MDTA is planning for the re-opening of some of these lots as well as construction of new park-and-ride facilities throughout the County with expanded Metrobus service to them. And the FDOT is currently undertaking a study for pricing and constructing park-and-ride lots throughout the County.

Park-and-ride lots provide an excellent location for the staging of carpools, vanpools, subscription bus service, express buses, shuttles (to Metrorail for example), and even local bus service. These are especially effective when provided along HOV facilities or shuttle

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<sup>12</sup>There are publicly sponsored vanpool programs in the nation that Dade County can use as models. The largest is currently Seattle, which operates about 350 vans, the second largest is now Brevard County with about 75 vans.

bus routes (to Metrorail for example) which can provide travel time savings. The combination of TDM services provided at park-and-ride lots should be carefully planned so as to not deter from the success of any of them. Many of the existing (active and inactive) lots in Dade County are already located along or near roadway facilities that are congested. This TDM action calls for the proposed lots to be constructed, and to expand the use of the existing active and inactive lots.

The strategies for increasing the use of park-and-ride lots are as follows.

**Policy/Regulation.** The County should proceed with implementation of its Park-Ride Lot Plan, and the inactive lots—those which make sense to re-open—should be reactivated. All of the lots should be maintained and provide sheltered waiting areas. A certain degree of safety should also be visible to the lot user through lighting, maintenance of landscaping, and frequent security patrols. The lots should be served by frequent MDTA service to them including local and express Metrobus service and KAT- and MAX-type services. Gold Coast Commuter Services should use the location of these lots in their carpool matching analysis to expand the area of the trip origin, thus matching carpoolers who can stage at the lot.

**Funding.** Funding for construction and maintenance of these lots will come from the County and FDOT and with possible additional funding from FTA.

**Implementation Strategy.** Park-and-ride lots provide a linkage between the SOV and ridesharers and transit riders. Marketing of these other TDM actions needs to include the ability to use these lots as staging areas. Lots, particularly if they are free, should also be marketed as an easy and pleasant way to use mass transit, both through the provision of timely bus service and rider amenities (security patrols, lighting, covered access, newsstands, telephones, etc.) at the lots.

Re-opening of existing but inactive lots, and construction of new lots, should conform to the FDOT *State Park & Ride Lot Program* criteria. These include factors such as existing and proposed residential development in the area, intensity and concentration of employment, distance between major residential areas and employment centers, and level of service provided by the planned transportation system.<sup>13</sup> Table 1 provides specific criteria for the siting of various types of park-and-ride lot facilities.

### **Flexitime**

Flexitime provides the ability for an employee to work non-traditional hours. It is regarded as a TDM action because it has the potential to schedule commute trips away from

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<sup>13</sup>Frederic R. Harris, Inc., *Florida Department of Transportation, State Park & Ride Lot Program: Planning Manual*, December 1989, p.4-2.

**Table 1**  
**SYSTEMS-LEVEL PARK-AND-RIDE LOT FACILITY SITING CRITERIA**

| Lot Type       | Criteria                                | Standards                                       |
|----------------|---|---|
| Urban Corridor | Future corridor level-of-service        | Level-of-Service E or worse                     |
|                | Future corridor traffic                 | 50,000 ADT                                      |
|                | Service area dwelling units             | >2,000 dwelling units within 2 miles of lot     |
|                | Distance from employment centers(s)     | >10 miles                                       |
| HOV Corridor   | Traffic of feeder route to HOV facility | High volumes, >35,000 ADT                       |
|                | Feeder road system configuration        | Confluence of feeder roads near facility        |
|                | Lot spacing                             | 5-10 mile spacing minimum                       |
| Peripheral     | Parking demand/supply                   | >1.0  |
|                | Activity center circulation             | Congested or restricted access                  |
|                | Activity center access route            | Major access route                              |
|                | Existing parking facilities             | Insufficient in area                            |
| Urban Fringe   | Access corridor to urban area           | Arterial with 4 lanes or greater                |
|                | Employment concentrations               | >10,000 employees per employment                |
|                | Location within urban area              | Vicinity of urban area boundary                 |
|                | Vicinity of shopping centers            | <3/4 mile from commute route                    |
| Remote         | Orientation to urban area               | Between 20 and 60 miles from employment centers |
|                | Urban employment                        | >20,000   |
|                | Orientation to service area population  | Centrally located                               |
|                | Available right-of-way                  | Publicly-owned right-of-way available           |
|                | Commute route                           | <1 mile from commute route                      |

Source: Frederic R. Harris, Inc., *Florida Department of Transportation State Park & Ride Lot Program: Planning Manual*, 12/89.

the peak travel hours or to obviate the work trips altogether (as in a compressed work week described below). The most effective of the flextime programs—with regard to TDM—are compressed work weeks, which require employees to work longer hours on a four (ten-hour days) day, or four and one-half (four nine-hour days and one four-hour day) day workweek. This technique discourages travel during at least one peak period, and the longer workdays

**Table 2**  
**PROPOSED LOW COST TDM ACTIONS DIRECTED AT EXISTING WORK TRIPS**

| TDM ACTION                          | PROGRAM DESCRIPTION AND GOALS  | REQUIREMENTS   |  |  |  | IMPLEMENTATION   |   |  | ANTICIPATED RESULTS   |
|-------------------------------------|--|--|--|--|--|--|---|--|---|
|                                     |  | POLICY/REGULATIONS   | FUNDING  | SUPPORTING TDM ACTIONS   | OTHER  | STRATEGY   | ISSUES  | RESPONSIBILITY   |   |
| Carpool Programs                    | Encourage and facilitate employee ridesharing to and from work.<br><br><u>Goal:</u> Reduce peak hour SOV.  | Strong promotion of program is required.                                     | County and FDOT fund start-up costs. Employers pay for implementation of program.                                  | Matching services; Employer-based Transportation Coordinator (TC); Flexibility in work scheduling; Preferred parking; Midday employer vehicle; Guaranteed ride home; HOV lanes | Matching service and promotion of carpooling already in place in Dade County through GCCS. | Promote through public agencies, civic organizations, large employers, and the Regional Commuter Assistance provider (GCCS). | Employer support; Employee convenience; Tangible benefits.              | County and GCCS promotion and training of TCs. Employer implementation of program. GCCS provides matching service. | Peak period vehicle trip and vehicle miles of travel (VMT) reduction; Improved air quality (A.Q.); Decreased SOV. |
| Subsidized or Reduced Transit Costs | Reduce employee transit trip cost.<br><br><u>Goal:</u> Promote use of transit.   | Promote transit use. No regulation needed. Discounting policy by the County. | Employer and MDTA.   | Parking disincentives and improved transit service.  | Implement with existing transit pass service.  | Employer and County may trade auto-associated costs (road improvements, parking) for transit costs.                          | Employer reluctance; Income tax laws; Transit operating subsidy limits. | County promotion and MDTA and employers implement.   | Reduction in VMT; Improved A.Q.   |
| Vanpool Programs                    | Provide large employers with rideshare program for employees with longer commutes.<br><br><u>Goal:</u> Promote ridesharing and reduce peak hour SOV. | County and GCCS promote program to major employers. No regulation needed.    | County and FDOT may fund start-up costs for training and initial administration. Employer/Employee implementation. | Matching; T.C.; Parking disincentives; HOV lanes; and Road pricing.  | Matching service and promotion of ridesharing already in place through GCCS.               | Promote through public agencies. Contract with vendor (VPSI). Employer supplied vehicles (Fleet).                            | Employer resistance to costs and management commitment to program.      | County promotes program and provides training. GCCS provides matching service and employer implements program.     | Peak period vehicle trip reduction (up to 20%, or more, per employer) and improved A.Q.                           |
| Increased use of Park-and-Ride Lots | Consolidate and/or enlarge lots and serve with transit.<br><br><u>Goal:</u> Promote transit use and ridesharing.                                     | Provide transit on 20-minute headways.                                       | Traditional-through County or FDOT.  | Parking disincentives; transit subsidies; and HOV lanes.   | Used and unused lots already exist and MDTA and FDOT have plans for new lots.              | More efficient use of existing resources and promotion of facility   | Site accessibility and MDTA resource availability.                      | MDTA/FDOT  | Reduced VMT; Improved A.Q.; Increased transit use.  |
| Flextime                            | Convert to 4-day or 9/80 work weeks.<br><br><u>Goal:</u> Reduce peak hour trips.   | Promote program to employers. No regulation needed.                          | None needed.   | Child day care for longer workdays (preferably provided by employer).  |  | Promote as employee and employer benefit.  | Employer resistance to change. Perceived need "to be present."          | County promotes and employers implement.   | Reduced peak period vehicle trips (one day per week); Improved A.Q.   |

the out-of-pocket the costs associated with SOV commuting and serves as an incentive for using one or more of the TDM actions made available to the employee, particularly transit with which the employee incurs no out-of-pocket costs for parking.

The strategies for implementing employee-paid parking are as follows.

**Policy/Regulation.** An areawide policy is required to implement this type of strategy. If this is not done, landlords and employers unwilling to participate in this program can gain a recruiting advantage by offering subsidized parking as an enticement. It is critical that this type of action be implemented along with other complimentary TDM actions such as carpool programs, transit service, employee travel allowance and flextime. Another policy issue relates to existing zoning codes. Even well-intentioned employers and developers may not be able to undertake a program of this nature given the requirements for parking minima.

**Funding.** No public or private funding required. Significant increase in employee out-of-pocket costs of travel to work.

**Implementation Strategy.** The greatest impediment to this action's success is resistance by the public sector to enact legislation to adopt an areawide policy against free parking. Once enacted, this strategy may be marketed to employers as a cost-saving mechanism. Educating employees as to the actual costs of parking will also be a necessary part of the promotional effort of implementing this action.

#### Employee Travel Allowances

Employee travel allowances are a variation on employer-sponsored transit subsidies. In this application, employees are provided with a monthly stipend, to cover their travel costs to and from work, as part of their compensation package. The allowance amount should ideally total more than the cost of a monthly transit pass, but less than the monthly parking cost (this may require adjustments to parking fees paid by employees). Employees are then free to choose the mode on which they will travel to and from work. This action can be undertaken either independent from or as a part of the employee-paid parking action described above.

The strategies for implementing employee travel allowances are as follows.

**Policy/Regulation.** No local government policy is required to implement this action, however the federal tax code may need amending to gain full benefit from this strategy. It is an excellent complimentary action to an areawide policy of employee-paid parking. This TDM action can be marketed to employers as a substitute for paying for parking, and can also be implemented in conjunction with reduced transit passes, carpool and vanpool programs.

**Funding.** Funding for this action comes exclusively from employers. However, if employers choose to swap parking subsidies for this employee travel allowances, no additional costs may be borne. MDTA may provide additional subsidies to those employers who implement this program along with employee-paid parking.

**Implementation Strategy.** An impediment to this action is that parking costs are now usually included as part of the rent payment for office space. A strategy to help implement this action may be require landlords to exclude the cost for parking from their leases. The next step would be to aggressively market this action to the private sector as a cost transfer mechanism. This strategy should also reduce the amount of parking needed.

### **Congestion Pricing**

Similar to parking pricing, charging a fee for the use of a road, or a fare differential (depending on time of day) to use public transit, can be a deterrent to the use of transportation facilities during peak hours, particularly for those users who do not want to pay the "price" associated with the use of these facilities. Unlike tolls, which are typically used to finance the facility, the price charged for using the transportation facility represents the cost that the individual creates by using the facility, for example through increased delays. The intent of congestion pricing is to price transportation facilities so that a sufficient supply of capacity is provided for those willing to pay this price. The goal of this measure is for people to seek alternate (lesser priced) modes of transportation, or to share the costs through programs such as ridesharing.

Given the overwhelming use of roadways for commuting, congestion pricing in Dade County should be used to regulate the use of roads and not transit. Road pricing can be implemented locally with existing toll booths on highways by charging different rates at different hours, with peak hours being the most expensive. Another implementation strategy could involve installing toll collection facilities on ramps leading to highways to both meter traffic and to price the road. Transit can also be included in the congestion pricing implementation strategies. Lower fares can be charged during peak hours to encourage the use of the system during peak hours.

This strategy would lower the demand on the roads, but increase the demand on transit. The County would therefore need to be prepared to provide additional capacity on those routes that would require it. Given the lower fares, the County may also have to provide additional subsidies for these routes, which could be made up with the roadway fees.

The strategies for implementing congestion pricing are as follows.

**Policy/Regulation.** New laws, policies, and regulations would have to be adopted to implement this action. For road pricing, need for enabling legislation would potentially be necessary to change the tolls on the state highways or to add new ones. Feasibility studies and capacity analyses would also have to be undertaken to determine the impacts of new

toll facilities on the roadways. Transit pricing would be a little less complex since MDTA is wholly under the County government. Analyses would also be necessary for this as well, however, to plan for the impacts on ridership and subsidies.

**Funding.** Funding for this action would come from the FDOT for the roadway toll facilities and by the County for the Transit pricing actions.

**Implementation Strategy.** This action would require extensive planning, analysis, public education and promotion prior to its implementation. A number of studies, as discussed above, would need to be undertaken to determine the political, physical, and operational feasibility of this action. Popular support would then have to be garnered through meetings with the chambers of commerce and other public and political entities. The action would have to be promoted as part of a larger package of TDM strategies particularly to the commuting public.

### Subscription Bus Service

Subscription bus service is similar to vanpool programs, except it operates with larger vehicles. Subscription buses are chartered vehicles which provide scheduled service to and from major origins and destinations. These may be run by a major employer if a large number of employees live in a similar area, or by a large residential development whose residents work in one or two similar locations. Two examples would be a major airline headquartered at Miami International Airport with a large number of its employees living in south Broward County, or a large number of the residents of Fountainbleu Park who may work in downtown Miami and the Civic Center. Subscription buses may also be operated by private operators serving specific origins and destinations.

The strategies for implementing subscription bus service are as follows.

**Policy/Regulation.** Except for allowing MDTA buses to be chartered for this purpose, no governmental policy is required to implement this action. When this action is implemented, MDTA should establish policies, maximum subsidies, and fares for this type of service. Private companies should also be contacted and requested to set up the same type of guidelines and be prepared to work with the requesting employer or resident association.

**Funding.** Funding for this action comes primarily from private employers, resident associations, and users of the service. However, the County could seek funding from FDOT and FTA to entice private groups to run this service if interested groups are found to undertake the action.

**Implementation Strategy.** This action needs to be aggressively marketed to major employers and large residential areas. Preliminary planning could be undertaken for this program, with the help of GCCS, by matching origins and destinations for selected

employers and residential areas. Arrangements for the vehicle may be made with MDTA to charter the buses for a limited number of round trips at specified hours, or with third party companies. If significant matches were found, pilot programs could be established operating from stops at the residential developments or from park-and-ride lots. As with other TDM actions, increased employee parking fees, reduced parking availability, and flextime could all promote use of the action.

### **Telecommuting**

With the advancement of telecommunications equipment such as telephones, facsimile machines, and computers, a viable option to commuting is to work at home. Telecommuters are people who do some amount of income producing work at home, usually one to four days per week. This eliminates a portion of weekly work trips. The strategies for implementing telecommuting are as follows.

**Policy/Regulation.** None needed.

**Funding.** Funding for this action is borne mostly by private employers (and, possibly, partially by the employee). Costs may include computer equipment, telephone hook-ups, fax machines, and other equipment required by the employee to do the job at home. In some cases employees who already have this equipment available may substantially reduce the costs to their employers.

**Implementation Strategy.** This action can be promoted to employers as a way to reduce overhead costs while providing a convenience to their employees. Companies in the data entry and telemarketing fields are especially good candidates for this type of TDM action. They may be able to reduce overall floor space and obtain greater efficiency due to reduced interruptions.

### **Summary**

Table 3 provides a summary of the proposed long-term TDM actions aimed at reducing existing trips.

### **ACTIONS DIRECTED AT NEW TRIPS**

There are six proposed TDM actions that are specifically directed at reducing the travel demand created by new developments. These actions are proposed for implementation at the site plan approval stage of new development, and may be implemented by the County immediately, or in stages. Prior to describing these actions, it is important to note that the TDM actions directed at "existing" work trips, described above,

**Table 3**  
**PROPOSED LONG-TERM TDM ACTIONS DIRECTED AT EXISTING WORK TRIPS**

| TDM ACTION                | PROGRAM DESCRIPTION AND GOALS  | REQUIREMENTS   |   |   |   | IMPLEMENTATION   |   |  | ANTICIPATED RESULTS   |
|---------------------------|--|--|---|---|---|--|---|--|---|
|                           |  | POLICY/REGULATIONS   | FUNDING   | SUPPORTING TDM ACTIONS  | OTHER   | STRATEGY   | ISSUES  | RESPONSIBILITY   |   |
| Employee-Paid Parking     | Impose parking fees for all employees.<br><br><u>Goal:</u> To promote mode shift through increased commuting costs.                            | Areawide policy or regulation to charge for parking required.  | Self-Funding  | Rideshare program; Employee travel allowance; Improved transit service.                                       |   | Promote idea of employee's support of own cost; reduced parking needs; economic benefit to employers and developers. | Employer/landlord resistance (external competition); Requires areawide implementation.                    | County and local government implementation and monitoring. | Increased ridesharing; Increased transit use; Improved A.Q. |
| Employee Travel Allowance | Employer stipend to pay for employee cost of worktrip.<br><br><u>Goal:</u> Provide incentive to change commute mode.                           | Promote program to employers.  | Employer  | Employee-paid parking; Transit promotion and subsidy; Ridesharing promotion.                                  |   | Promote to employers on basis of net cost to employee.   | Union contracts; employer net costs.  | County promotion and employer implementation.              | Reduced VMT and vehicle trips (5-8%); Improved A.Q.         |
| Congestion Pricing        | Add tolls on expressways serving employment centers and vary transit fares.<br><br><u>Goal:</u> Provide incentive to change commute mode.      | Enabling legislation required. Carpool, vanpool, transit programs and promotion. Strong promotion of need for the program. | FDOT  | Ridesharing; Transit; HOV Lanes   | Some toll facilities already in place on area expressways; others would need to be constructed.                   | Develop local support; seek legislation; develop implementation strategy.  | Political "hot potato;" may impact the economically disadvantaged; potential for expressway modification. | County promotion, and State implementation                 | Reduced vehicle trips and VMT; Improved A.Q.                |
| Subscription Bus          | Large employers, landlords, residential areas, and TMAs contract for private bus service.<br><br><u>Goal:</u> Promote large-scale ridesharing. | Promote program to employers and property managers. MDTA support of program.   | Employer, landlord, TMA, residents, and employees.    | HOV lanes; TC; matching; parking disincentives; midday vehicle; congestion pricing; and guaranteed ride home. | Matching service in place through GCCS; buses available from MDTA and tour companies; Park-N-Ride lots available. | Promote to largest employers and property managers and offer MDTA and GCCS support.                                  | Operating subsidy limitations; large organizational effort; bus availability; minimum charge for bus use. | County promotion and MDTA support. Private implementation. | Congestion reduction (reduced trips and VMT); Improved A.Q. |
| Telecommuting             | Establish home work stations.<br><br><u>Goal:</u> Reduce peak hour trips.  | None.  | Employer and employee funding of equipment as needed. | Congestion pricing.   |   | Promote as convenience and overhead reduction.   | Employer resistance to change in workforce communication. Equipment availability.                         | County promotion and employer implementation.              | Reduced VMT and peak hour traffic; Improved A.Q.            |

can easily be integrated into the development orders of proposed new developments. Similarly, many of the following actions directed at "new" work trips can be implemented at existing employment centers. The purpose for the distinction is that it will be easier to implement the following actions during the development approval process, than to attempt to persuade existing property owners to implement them.

### **Incorporate TDM as a DIC Alternative**

Transportation demand management actions directed at new trips would most often be incorporated through the County's Development Impact Committee (DIC). As a part of most major development orders, the DIC requires roadway improvements to be completed in conjunction with the proposed project. This action recommends that the DIC incorporate TDM into the repertoire of developer actions as an alternative, or in addition, to building or funding of new roadway capacity.

The strategies for implementing this process is as follows.

**Policy/Regulation.** The County—particularly the DIC—would have to amend its rules related to developer agreements to include TDM as an option, of equal stature, for capacity enhancements. A model for this strategy may be found in the *Montgomery County, Maryland Trip Reduction Ordinance*,<sup>14</sup> whose goal is similar to what is described herein.

**Funding.** None needed.

**Implementation Strategy.** This action will require amending the DIC operating procedures, and potentially the County Code, to include TDM as an alternative to road construction. Once in place, additional regulations related to monitoring, enforcement, and other responsible County agencies would also have to be put in place.

### **Negotiated TDM Developer Agreements**

Negotiated demand management agreements are similar to negotiated developer agreements for capacity enhancements on roadways, except these agreements seek to reduce the demand on the roadway system (by decreasing SOVs for example), instead of increasing capacity. They are implemented in an ad hoc manner, on individual development orders. The agreements typically set a trip reduction goal, often expressed as a percentage of rideshare participation or average work trips per vehicle, that the developer must meet through any number of methods. Some agreements prescribe methodology, such as the requirement to institute a carpool or parking pricing program, while others simply measure results to determine whether the goal is being met. Failure to institute the programs and/

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<sup>14</sup>For a broader discussion of this TRO, see: Barton-Aschman Associates, Inc., *Transportation Demand Management and Congestion Mitigation Study, Trip Reduction Ordinances: Technical Memorandum*, Metro-Dade Metropolitan Planning Organization, March 1992, pp. 5-6.

or meet the trip reduction goals are usually met with monetary penalties or withholding of additional building permits or certificates of occupancy for multi-phased developments.

The strategies for including TDM actions in developer agreements are as follows.

**Policy/Regulation.** In order to provide developers with the option of undertaking TDM actions instead of capacity improvements, existing County policies related to fair share assessments will have to be amended. This may include review of existing land development regulations and DIC policies. Developer commitments should be a combination of transportation improvements and demand reductions, which at least mitigate the project's impacts.

**Funding.** Funding for TDM actions implemented under negotiated developer agreements are borne by the land developer. Funding for these actions are typically secured by a performance bond or letter of credit, similar to those used to secure capacity improvements.

**Implementation Strategy.** This action will require educating the development community as to the benefits of implementing TDM actions instead of, or in conjunction with roadway capacity improvements. It will also require a review of DIC policy and encouragement of DIC staff to look for and encourage TDM actions from developers.

### **Mixed-Use Developments**

Encouraging the construction of mixed-use developments is a way of reducing traffic through the use of complimentary land uses and supportive urban design techniques. Mixed use developments provide for a large portion of the needs of its tenants within the development, such as residences, retail, businesses, offices, and transit access. By building mixed-use developments, off-site resident and employee vehicular travel can be significantly reduced through the internalization of work trips and shopping trips, potential for increased transit service, and shared parking opportunities. Large mixed-use developments also tend to be places where ridesharing, transit, and other trip reduction programs may be easily implementable, due to the large numbers of people who work or live at the site.

The strategies for encouraging mixed-use developments are as follows.

**Policy/Regulation.** In order to encourage developers to construct mixed use developments, incentives related to reductions for shared parking, fair share assessments, and concurrency exemptions may have to be adopted. This will require a review of the County's Land Development Regulations (LDRs) and DIC policies. These will provide incentives to developers in the form of development cost reductions.

**Funding.** Funding for mixed use developments are borne by the land developer.

**Implementation Strategy.** This action will require educating the development community as to the benefits of constructing mixed use developments.

### **Parking Supply Limitations**

Parking supply limitations involve the reduction in the availability of private, off-street parking through a reduction in parking ratios. The goal of this action is that by limiting the supply of private (and free) parking at employment centers, employers and commuters will be induced into using alternate modes of transportation. In order for this action to be successful, there must be travel alternatives in place for the commuter. Otherwise parking problems, such as spillage into the surrounding areas or increases in illegal parking, will develop.

A problem with parking supply management is the zoning requirements imposed by local governments. These are often a part of a separate set of review criteria (not related to transportation). They may be difficult to coordinate with TDM efforts due to differing layers of government enforcement (municipal zoning versus the County's congestion management program). Another obstacle is the requirements imposed by lending institutions on developers. Minimum lender parking requirements many times exceed those of municipal zoning codes. A developer may run the risk of losing financial backing for a project if these higher parking requirements are not strictly adhered to.

Another dilemma with regard to parking pricing and management are the public parking facilities constructed and operated by local governments. Several Dade County municipalities provide public parking facilities (garages and on-street meters) as a service to their commercial districts, or for the control of on-street parking. Over time, many of these parking systems have become revenue generators for the local governments. As governments rely on this revenue stream to fund the existing parking facilities as well as other services, it may become difficult to use parking curtailment as a TDM strategy.

Regardless of these issues, parking supply limitations are a viable option in affecting commuter mode choice. The strategies for implementing this action are as follows.

**Policy/Regulation.** Municipal and County zoning ordinances would have to be amended to implement this action. Other TDM actions, such as carpool programs and increased transit service would already have to be in place prior to implementation and enforcement of this action.

**Funding.** None needed.

**Implementation Strategy.** This action would have to be promoted to the development and banking community as a cost-saving measure. Success of other, established TDM measures would probably be necessary.

### **Pedestrian Amenities at Suburban Centers**

The provision of pedestrian amenities such as sidewalks, covered walkways, and safe street crosswalks, to conveniently link various destinations addresses these safety and transportation issues and greatly reduces the need for automobiles, especially for midday trips. Many commuters claim that their need for autos for midday trips require them to drive to and from work. Streetscape amenities such as benches, street lighting, and landscaping (especially canopy trees to provide cover from the sun) also aid in encouraging walking as an alternate mode of transportation, especially where distances between attractions are convenient for walking. When implemented in conjunction with public transit enhancements, pedestrian amenities also make the use of public transit more attractive.

The strategies for implementing pedestrian amenities at suburban activity centers are as follows.

**Policy/Regulation.** County zoning ordinances, and DIC policies would have to be amended to include pedestrian amenities in the site plan approval process.

**Funding.** Funding for additional pedestrian amenities at activity centers would be borne by the developer.

**Implementation Strategy.** This action will require educating the development community and development review agencies as to the benefits of constructing pedestrian amenities as a part of their suburban projects.

### **Bicycle Facilities and Parking**

For bicycling to be a more viable commuting option to the automobile in the United States, it must be made more convenient and safer. Measures toward achieving this include the provision of safe and attractive bicycle routes, shower and locker facilities at the destination (employment center), and secure bicycle parking facilities, such as lockers or racks. Similar to automobile park-and-ride facilities, bicycle parking areas may also be provided at transit stops and stations to encourage bicycling to these facilities.

The strategies for implementing this action are as follows.

**Policy/Regulation.** County zoning ordinances, and DIC policies would have to be amended to include bicycle parking and locker and shower facilities as part of the site plan approval process—at least for major destinations. In addition, construction of off-site bicycle facilities, particularly connections to major existing bikeways should be considered as part of the fair share assessments of major developments

**Funding.** Funding for on-site and off-site bicycle amenities at activity centers are borne by the developer.

**Implementation Strategy.** This action will require educating the development community as to the benefits of constructing bicycle facilities as a part of their suburban projects.

### **Summary**

Table 4 provides a summary of the proposed short-term TDM actions aimed at reducing new trips.

## **REQUIRED COMPLIMENTARY ACTIONS**

Many of the TDM actions, like the ones described above, have been proven to be successful in reducing travel demand in and of themselves. However, greater reductions in travel demand can be achieved if additional complimentary actions are implemented along with them. These actions serve as a way to facilitate the planing, promotion, and implementation of TDM actions. They include: (1) marketing, the tool for promoting TDM; (2) use of transportation coordinators (TCs), the employer marketer; (3) creation of TMAs, an implementation strategy; and (4) adoption of a trip reduction ordinance (TRO), a stronger impetus for participation by the private sector in congestion management activities. These actions are described in greater detail below.

### **Marketing**

Marketing of TDM measures is an important institutional element of this strategy. In a voluntary environment, the effectiveness of the marketing program will determine the extent to which TDM programs are implemented. Many TDM measures are based on developing alternatives to the single occupant automobile so that commuters will voluntarily switch modes. Once these alternatives are established, proper marketing enables the target groups to be reached and be provided with a choice of commuting alternatives.

The FDOT sponsors/funds regional commuter assistance programs (CAP) to market and promote TDM measures. In September 1991, the GCCS program became a stand alone project, not related to any one construction project (such as the I-95 expansion), to market commuting alternatives in the region. As part of its TDM marketing efforts, the GCCS program provides technical assistance to local governments, employers, and emerging TMAs.

### **Transportation Coordinators**

The marketing of TDM actions by GCCS will continue, and should be expanded, once the CMP is adopted. On-site marketing of TDM can be enhanced through the hiring of a transportation coordinator (TC). A TC is an individual who is responsible for instituting

Table 4  
PROPOSED TDM ACTIONS DIRECTED AT NEW WORK TRIPS

| TDM ACTION                               | PROGRAM DESCRIPTION AND GOALS   | REQUIREMENTS  |                           |  |   | IMPLEMENTATION  |   |  | ANTICIPATED RESULTS   |
|--|---|---|---------------------------|--|---|---|---|--|---|
|  |   | POLICY/REGULATIONS  | FUNDING                   | SUPPORTING TDM ACTIONS   | OTHER   | STRATEGY  | ISSUES  | RESPONSIBILITY   |   |
| Negotiated TDM Developer Agreements      | Use TDM actions as an additional tool for traffic mitigation for new developments.<br><br>Goal: Address travel demand instead of increasing capacity.                 | Allow TDM to be used as a traffic mitigation tool. Modify DIC development review criteria. Enforcement of TDM actions agreed to is required.                        | Developer backed by bond. | All employer or landlord-based TDM measures.   | Program needs to be developed prior to implementation. (Review of Montgomery County TRO for example.)   | Liberalize mitigation requirements while retaining guaranty. Regular monitoring and enforcement required. | Developer reluctance and reliance on others for program success.                                  | Developer implements and County enforces.                | No further degradation of roadway system; Vehicle trip and VMT reduction; Improved A.Q. |
| Mixed-Use Developments                   | Developments with complimentary uses to satisfy travel needs internally.<br><br>Goal: To reduce midday and peak hour travel.  | Encourage through bonus or reduction of other requirements as part of zoning code or site plan review.  | None needed.              | Pedestrian connections; Transit facilities.  | Residential uses have most potential for trip reduction but are most difficult to include in development program. TND ordinance already in place. | Create policy and promote as cost saver (parking).  | Developer reluctance; Zoning/planning concerns.   | County review and enforcement; Developer implementation. | Reduced midday and peak period travel; Reduced VMT; Improved A.Q.                       |
| Parking supply Limitations               | Limit supply of private (free) parking at employment centers.<br><br>Goal: Provide incentive for mode shift or ridesharing.   | Permit or require lower parking ratios at employment locations together with TDM measures.  | None needed.              | Rideshare; TC; Transit promotion and subsidy; Employee-paid parking.                     |   | Amend County code and promote.  | Lender resistance; market competitiveness; Developer reluctance; Developer reliance on employers. | County review and enforcement; Developer implementation. | Reduced vehicle trips and VMT; Improved A.Q.  |
| Pedestrian Amenities at Suburban Centers | Develop pedestrianways with amenities between destinations to attract shorter trips.<br><br>Goal: Reduction of midday trips.  | New County policy that all developments over a specific size to provide or connect to pedestrian facilities connecting to nearby developments and/or transit stops. | Developers.               | Transit stop amenities; Bicycle facilities.  |   | Amend County code or policy.  | Developer indifference.   | County plan and review; Developer implements.            | Reduced vehicle trips and VMT; Improved A.Q.  |
| Bicycle Facilities and Parking           | Require on-site bicycle parking, connections to bike routes, and amenities within and adjacent to all new development.<br><br>Goal: Provide incentive for mode shift. | Promote bike usage for work trips; Amend County code to include bike requirements; Promote bike links to transit.   | Developers.               | Bike lanes and paths in major connector routes; Employee-paid parking; Expressway tolls. | County Bike Plan and Bike-on-trains program already in place.   | Promote bikes as viable alternative to cars as well as healthy/exercise way to commute.                   | Developer cost in view of low utilization; Bike lobby support.                                    | County enforcement at site plan review.                  | Small reduction in vehicle trips and emissions.   |

and/or coordinating alternative commute mode options, alternative work hour programs, and available travel reduction measures at a given employer or employment center.

Transportation coordinators also handle the establishment and operation of TDM programs based on geographic location. They may function as rideshare matchers, procurers of vehicle contracts for vanpool or bus programs, and vendors of transit passes. The TC is the person usually charged by an employer, or other organization, with implementation of a TDM program.

### **Transportation Management Associations**

Transportation Management Associations (TMAs) are organizations which are usually formed by local businesses, corporate employers, and developers to address community transportation problems. These organizations are sometimes formed in partnership with local, regional, or state government agencies. Although TMAs have varying missions and scopes, all are grounded in the common principle that reducing congestion is a private as well as a public sector responsibility. The Center for Urban Transportation Research (CUTR) at the University of South Florida, through its TMA Clearinghouse, is involved in assisting in the development of TMAs throughout Florida, as well as keeping up-to-date information on existing and emerging TMAs throughout the country.

Transportation Management Associations typically have several other characteristics, in addition to those cited above that distinguish them from other organizations which may deal with transportation issues. They generally: possess non-profit corporate status; place decision-making in the hands of member representatives; maintain small staffs of transportation marketing professionals, planners and liaison personnel; and are funded by membership fees and assessments. All Florida TMAs have utilized FDOT seed money to help with start-up costs, and as shown in Figure 1 must be established with the help of the local CAP (GCCS in Dade County). The funding mechanisms, purpose, size, and specific membership of each TMA must be tailored to meet the needs of each area. Some TMAs have been mandated by ordinance and may include public sector revenues. Member fees may be voluntary, required by regulation, or a combination of both.

Transportation Management Associations provide an organizational framework and a structured environment for private sector activities in transportation, and for cooperative efforts of developers, development managers, and employers to participate in traffic mitigation programs. These organizations also provide a forum in which the private sector and local government can jointly address local transportation and congestion problems. Another key to a TMA's success lies in the synergy that is created by the joining together of several public and private entities. With large numbers, the TMA goals of addressing traffic congestion, air quality, and other employment issues, can be addressed more effectively through TDM strategies. All of the measures aimed at influencing the use of the private automobile may be undertaken by or through TMAs.

### **Trip Reduction Ordinance**

Trip reduction ordinances are enacted by local governments for the purpose of reducing traffic congestion, and as in California, to improve air quality. Similar to the adequate facilities requirements of growth management, these ordinances typically establish goals or levels of performance which must be met. The "stick" in many of these ordinances is withholding of certificates of occupancy, or levying fines based on the number of trips over the established goal. Trip reduction ordinances typically include one or more of the following performance measurement requirements, and employer or developer requirements:

- Participation Rate: the percentage of employer's work force expected to commute to and from work by a mode other than SOV;
- Vehicle Trip Reduction: the percentage reduction in vehicle trips;
- Peak Hour Vehicle Trip Reduction: similar to the vehicle trip reduction goal, but limited to the morning or evening peak hour;
- Level of Service (LOS): refers to the desired traffic conditions;
- Collect & Report Data: the employer or developer is required to periodically collect data, conduct surveys, and report on employee or activity center travel behavior;
- Transportation Coordinator (TC): the employer or developer is required to designate a transportation coordinator, who is usually responsible for instituting and/ or coordinating alternative commute mode options, alternative work hour programs, and available travel reduction measures;
- Marketing: the employer or developer is required to publicize, promote, and disseminate information on the trip reduction programs being utilized; and
- Traffic Mitigation Programs: the employer or developer is required to develop traffic mitigation programs which may include any one or combination of the TDM techniques discussed in this report.

### **Importance of Complimentary Actions**

Transportation demand management actions are designed to provide the commuter with alternatives to driving to work alone. In a voluntary program such as the one envisioned in Dade County, complimentary actions are crucial to the success of TDM. The first three actions—marketing, TCs, and TMAs—should be implemented as a "short-term" action in support of the CMP. If the TDM actions do not attract a sufficient amount of participants, or if existing congestion problems worsen in spite of the CMP, then adoption of a TRO should be considered.

## 5. CMP IMPLEMENTATION

The purpose of Dade County's *Transportation Demand Management and Congestion Mitigation Study* is to develop a Congestion Management Plan (CMP) that will reduce traffic congestion on the County's existing roadway system. To this end, a series of major study documents have been prepared in support of the CMP. They are:

*Current Efforts in Transportation Demand Management and  
Tools for its Implementation in Dade County*

*Trip Reduction Ordinances: Technical Memorandum*

*Travel Demand Management Reader & Bibliography*

*Congestion Management Plan: Background Report*  
(This document)

The Plan to be adopted is contained in a separate document.

The CMP recommends a series of TDM actions directed at existing and new work trips have been proposed. These actions make up the backbone of the proposed congestion management program. In order to make these actions, and, by extension, the County's congestion management program, the following requirements will have to met.

1. Adoption and full political backing of the CMP, its goals, programs, and recommendations, through adoption by the MPO Board and the Board of County Commissioners.
2. Funding and implementation of the Plan and its proposed TDM actions in an orderly and well thought out manner.
3. Implementation of the TDM actions by the County at all of its offices and agencies as an example of how employer-based TDM actions work.
4. High profile public relations and education program promoting the benefits of the CMP and the TDM actions in particular.
5. Widespread participation in the program by other public and private employers throughout the County.

## IMPLEMENTATION STRATEGIES

There are a number of CMP implementation strategies available to Dade County. As was previously noted, the County's current position is that a TRO will not be adopted as a part of this plan. Given that fact, listed below are a series of implementation strategies (from least ambitious). Each successive strategy is inclusive of the actions of the preceding one, and may include some or all elements of the preceding. There is a possibility that a strategy to deal with existing trips may be different from that espoused for new trips. Therefore, a different one can be selected to deal with each of these scenarios.

**CMP not Adopted/Support Ongoing TDM/TMA Efforts.** The CMP is not adopted by the MPO Board or the Board of County Commissioners. Efforts to mitigate traffic congestion are already on-going in Dade County. Thus, even without adoption, efforts to mitigate congestion—even if not formalized—can continue. The County may appoint a TC to assist in these efforts locally. And the GCCS program to market TDM measures, provide TDM technical support to area employers, and assist with TMA formation, can continue.

**Countywide CMP Adopted.** Adopt CMP and aggressively market the Plan's recommended actions to major employers and developers. This strategy may include FDOT or County training of employer TCs, seed funding for specific employer programs, creation of TMAs, and implementation—on a voluntary basis—of the "new work trips" TDM actions by the DIC.

**Trip Reduction Resolution.** Adopt CMP and pass resolution which requires certain employers (i.e. those leasing greater than 2,000 square feet) and residential developments (greater than 30 units) to post commute alternatives information—as recommended in the CMP—in a conspicuous place, provide rideshare information (such as GCCS's telephone number and survey form), and "encourage" TDM actions. The requirement would be enforced by County tax inspectors, and would be enforced by a reminder letter from the County's TC. Monitoring and evaluation of TDM actions may be performed by the County's TC and GCCS. Because there are no penalties under this implementation scenario, marketing strategies will have to rely on the development of relationships between major employers and the Regional Marketing Coordinating Team (RMCT).<sup>15</sup>

**TRO for New Trips Only.** The Board of County Commissioners adopts amendments of the County's CDMP to require new (large-scale) developments to implement the TDM actions directed at new trips listed in the CMP.

**TRO.** A trip reduction ordinance is adopted by the Board of County Commissioners, subsequent to adoption of the CMP, that implements the plan's recommendations and requires implementations of these by existing and new developments. The ordinance may

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<sup>15</sup>See *Plan Implementation* Section of Chapter 5 for a further discussion of RMCT.

include requirements that existing employers (of a minimum size, such as 100 employees) submit annual plans, enforcement procedures for failure to meet minimum requirements, monitoring, evaluation, and penalties.

## **PLAN IMPLEMENTATION**

Most TDM actions are relatively easy to implement, but difficult to make successful. All of the TDM actions described in the previous chapter, particularly those aimed at existing work trips, rely heavily on the cooperation of employers and employees to use the commute options that are provided for them. To help make these successful, the following implementation plan is provided.

**Plan Adoption.** Once a final draft of the CMP has been prepared, based on review comments by the CTAC, TPC, and MPO, it should be formally adopted by the MPO Board and Board of County Commissioners. This will provide the Plan's recommendations with the political backing that these type of "voluntary" TDM actions require.

**Amend GOPs & LDRs.** The County's Goals, Objectives, and Policies (GOPs), and Land Development Regulations should be amended as necessary to incorporate the recommendations of the CMP. Once this is done, staff at the County Planning and Public Works Departments, as well as DIC should be instructed to require consideration of TDM actions as part of the solutions to transportation issues and as an alternative to meeting concurrency requirements. Simultaneous with this, MDTA staff should be directed to develop implementation plans for the actions that require Metrobus, shuttle bus, or other transit services.

**Program Coordination.** An interagency agreement should be formulated and agreed to by FDOT, GCCS, Dade County MPO, MDTA, South Florida Regional Planning Council, and the municipalities related to the thrust, coordination, and implementation of the CMP programs. The purpose of this agreement will be to coordinate funding, TDM action implementation, new development requirements related to TDM, and TMA formation.

**Funding.** The federal Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 provides for six billion dollars in funding for congestion mitigation and air quality programs through 1997 (one billion dollars per year for six years). In addition, 31 billion dollars are authorized for mass transit, and 25 million dollars per year are available for funding 80 percent of congestion pricing pilot programs. Through adoption of the County's Unified Planning Work Program (UPWP), Dade County will be eligible for its share of these funds to undertake the CMP recommendations. In addition to federal funds, a number of local funding sources may be available to the County for CMP programs including seed funding for TMAs from FDOT, impact fees, and proffers from developers.

**Marketing.** An intensive promotional campaign should be instituted that describes the benefits of TDM. The marketing effort should be initiated by disseminating an

Employee Transportation Survey (already prepared by GCCS). The survey will provide the base data necessary to target TDM actions to specific groups of employers. Another key element of the marketing effort should be the creation of an RMCT. This group should be made up of representatives of key transportation-providers, whose focus would be on unified coordination of TDM actions and the County's CMP.

Once the survey has been analyzed and the RMCT is in place, the campaign should include, but not be limited to, public presentations by County staff at chambers of commerce, service organizations, professional associations (particularly those related to development, human resources, and transportation), and resident associations; distribution of pamphlets and brochures at major employment sites; print and broadcast advertising campaigns; and more intensive one-on-one promotion of TDM programs with major employers and resident associations. To the extent possible, local business associations should be encouraged to participate in this marketing effort.

**Initial Programs.** Metro-Dade should assign a full-time TC to plan, design, and implement TDM actions at County facilities. Metro-Dade will serve as the example of a major employer undertaking TDM actions. A second major, preferably private, employer (such as ATE/Ryder) should be selected to also undertake TDM actions. Both of these programs will serve as models for the rest of the County's employers.

**Designate TCs.** The County should encourage designation of transportation coordinators at sites that meet the minimum criteria for successful implementation of TDM actions.

**Consider TMA Formation.** Transportation management associations should be considered for areas where multiple employers, building managers, or developers are collectively interested in pursuing TDM as a coordinated group. TMAs should not be formed to "create" a travel demand program, but rather to assist in implementing the County's CMP.

## SOURCES

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