METROPOLITAN DADE COUNTY, FLORIDA

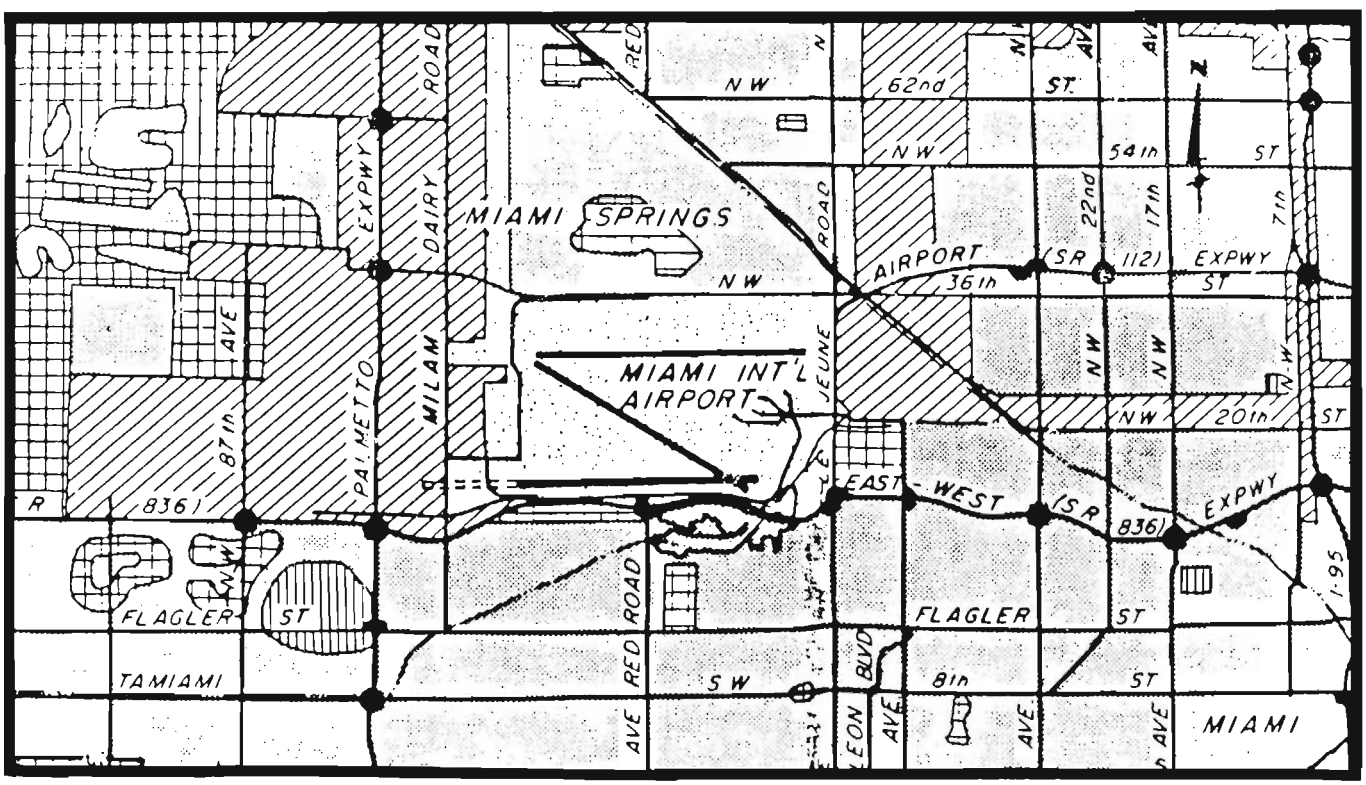
METRO-DADE COUNTY

METROPOLITAN PLANNING ORGANIZATION

MIAMI INTERNATIONAL AIRPORT TRANSPORTATION STUDY

FINAL REPORT

SUMMARY AND RECOMMENDATIONS



HARRIS

Frederic R. Harris, Inc.

MIAMI INTERNATIONAL AIRPORT TRANSPORTATION STUDY

FINAL REPORT:

SUMMARY AND RECOMMENDATIONS

Prepared for the
Following Organizations:

Metro-Dade Metropolitan Planning Organization
Florida Department of Transportation

By

Frederic R. Harris, Inc.

Consulting Engineers

January, 1989

MIAMI INTERNATIONAL AIRPORT TRANSPORTATION STUDY

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EXECUTIVE SUMMARY

The Miami International Airport (MIA) Area Transportation Study was conducted to enable officials within both Dade County and the State of Florida to assess the need for ground transportation improvements in the MIA area. Such improvements are critically needed in order to serve:

- Traffic approaching and departing the Airport
- Traffic circulating among various activities within the Airport area
- Non-airport traffic which uses the same area roadways as MIA traffic

The study recommendations were developed by a Steering Committee comprised of representatives from Dade County transportation agencies and the Florida Department of Transportation - District VI with consulting services furnished by Frederic R. Harris, Inc.

The study was based on extensive studies of transportation circulation - both existing and projected. Throughout this report frequent reference is made to three Technical Memoranda which have been prepared to document:

- Existing conditions
- Future conditions
- Formulation and assessment of alternative transportation improvements

The Miami International Airport is one of the largest regional traffic generators in South Florida. Further, the MIA complex is located within the rapidly developing West Dade County area. The MIA study area is illustrated in Figure I-1 of this report. Area roadways experience heavy traffic demands caused by a diverse mix of Airport travellers, commuters, truck traffic, service and industrial traffic, Airport employees and others.

Extensive roadway improvements are planned for the MIA area and many are programmed for implementation in the near future. These improvements will provide additional roadway capacity, improve the flexibility and mobility of travelers on area roadways and correct safety deficiencies. However, the Miami International Airport Transportation Study concludes that extensive transportation

improvements, beyond those already programmed and planned will be required to improve travel conditions over those which presently exist.

The MIA Transportation Study assessed five major conceptual alternative transportation system improvements which included a variety of freeway, arterial, intersection, interchange and mass transit solutions. These alternatives were studied in the context of transportation within the MIA area both to understand the transportation needs and feasible solutions for the Airport area and also to provide inputs to countywide transportation plans and programs.

The conceptual alternatives were evaluated to define an alternative transportation system which would best provide additional system capacity by implementing capital improvements to the highway and transit systems to reduce delays, eliminate capacity restrictions and provide alternative travel paths.

The assessment of alternatives considered numerous important factors including transportation measures of effectiveness, costs, network impacts, land use, environmental and social impacts plus access to MIA, and led to several general conclusions:

- Traffic on roadways within the MIA study area will increasingly be composed of regional traffic that is using Airport area roadways on its way to non-Airport destinations. This component will be in addition to traffic destined to the Airport and to Airport-related land uses.
- MIA will continue to be a major regional traffic generator in Dade County. However, by the Year 2010, only 20 percent of the traffic approaching MIA on regional roadways will actually have a destination within the MIA complex. The remainder will have destinations either within the airport vicinity or in other parts of the region.
- Although MIA is the largest single traffic generator, study area traffic problems are not solely attributable to MIA. It is important that transportation solutions developed for the MIA study area be fully integrated into county-wide and regional transportation plans.
- Introducing major new freeway corridors may draw regional traffic volumes from other roadways into the MIA area. Existing expressways and arterial streets which provide important access to MIA may also be required to

serve as feeder roads for new freeways. It appears that introducing major new freeway corridors may address regional traffic needs but may also worsen the traffic problems of the MIA area. It is important in this regard that areawide transportation plans and programs consider the needs and priorities not only of the Airport area but also of the entire county.

The alternatives analysis also pointed to several considerations which require additional study:

- o Define improvements which will encourage increased use of high-occupancy vehicles.
- o Identify regional improvements which will alleviate roadway congestion by diverting non-Airport traffic away from the MIA area.

Several components of the alternatives studied were also analyzed at the microscale level.

To address the extensive ground transportation needs of the MIA area, the study recommendations are presented within a framework of three ground transportation strategies:

1) Wherever possible, ground traffic approaching or departing MIA should be carried on separate, exclusive rights of way.

2) Specific transportation improvements are to be programmed for design and construction as soon as funding availability permits. These near term improvements include:

    - o Intersection improvements (turn lanes, storage lanes, traffic signal improvements, etc.) in selected sites within the roadways surrounding MIA.
    - o Construction of new interchanges on existing expressways to serve MIA traffic.
    - o Modifying existing expressway interchanges to increase their capacity.
    - o Selected roadway widenings to add through-traffic lanes.
    - o Direct connection between MIA and the rapid transit system.

3) Longer range transportation improvements which have impacts in a regional context and which also provide beneficial service to MIA are recommended for inclusion in the countywide transportation plan for Dade County. These improvements include:

- o New expressway corridors
- o Major expansion of the rapid transit system

These will require further study.

The MIA Transportation Study Steering Committee has proposed transportation improvement priorities for recommendation to the Transportation Planning Council and to the Metropolitan Planning Organization. The recommended improvements were derived based on analysis of long range transportation systems alternatives as described in Chapter V of this report. The MIA transportation improvements cannot all be implemented at the same time because of design and funding constraints and the need to maintain traffic. They should be considered together with other high priority county-wide transportation needs.

The recommended improvement projects are categorized by implementation priority as follows:

Category 1: These improvements are to be implemented as soon as plans production and funding permits.

Category 2a: These improvements are recommended for further study and near-term implementation.

Category 2b: These improvements are recommended for further study and long-term implementation.

These are summarized in Table S-1 and are shown graphically in Figure S-1.

TABLE S-1 RECOMMENDED IMPROVEMENTS

Project Location and Limits	Type of Improvement	Approximate Cost (million)	Remarks
CATEGORY ONE: IMMEDIATE IMPLEMENTATION			
o SR 112/MIA Terminal Connector	New 4 lane Roadway	13	Construction 1/89
o SR 836/MIA Terminal Connector	New 4 lane Roadway	13	
o Terminal Lower Drive Improvements		20	Included with Airport Construction Program
o SR 826 at NW 25 St.	New Interchange	15	
o NW 25 St. - SR 826 to NW 67 Ave.	Widen to 4 lanes	3	
o NW 16 St./NW 67 Ave. plus NW 25 St. to MIA Cargo Area	Widen to 4 lanes	3	Included with Airport Construction Program
o NW 36 St. - SR 826 to NW 57 Ave.	Widen to 6 lanes	5	Design Complete. R/W being acquired.
o Bridge over Miami River Connecting NW 21 St. to NW 32/37 Ave.	New Bridge plus Roadway improvements	7	
o SR 112 at NW 32 Ave.	New Interchange	3	
o SR 112 at NW 37 Ave.	New Interchange	4	Plus Connector to existing Tri-County Commuter Rail Station.
o SR 836/LeJeune Rd.	Improve/reconstruct existing interchange	3	
o SR 836/NW 57 Ave.	Improve/reconstruct existing ramps	1	

Table S-1 Recommended Improvements (continued)

Project Location and Limits	Type of Improvement	Approximate Cost (million)	Remarks
CATEGORY ONE: (continued)			
o NW 36 St. at LeJeune Rd.	Grade separated intersection	7	
o NW 36 St. at NW 72 Ave.	Grade separated intersection	5	
o LeJeune Rd. - SR 836 to NW 21 St.	Relocate and widen plus ramp to NW 21 St.	2	

* Cost estimates are in 1988 dollars and include the costs of construction and land acquisition but do not include the costs of acquiring buildings in the right-of-way, business damages or relocation costs.

Table S-1 Recommended Improvements (continued)

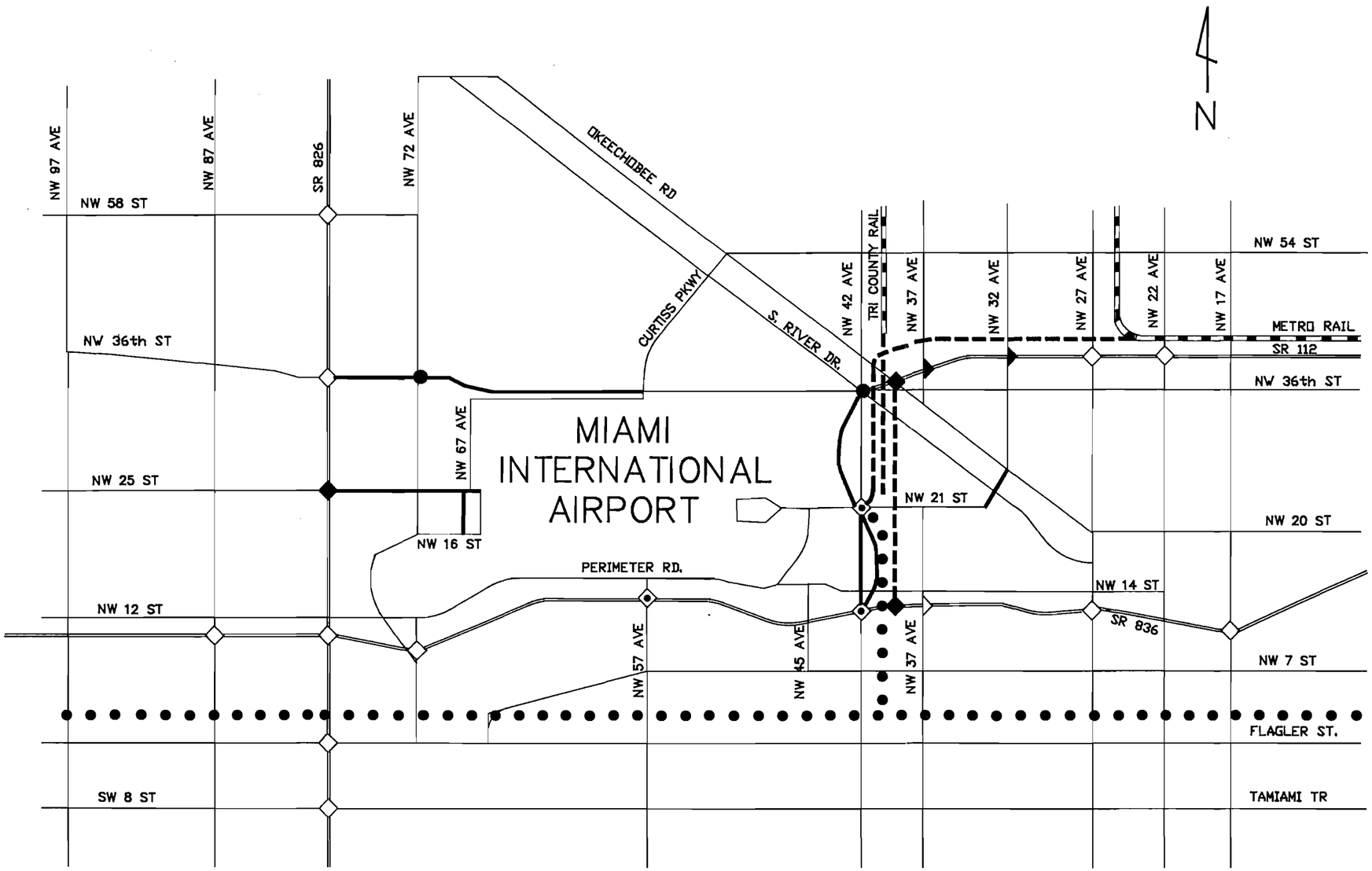
CATEGORY 2a: FURTHER STUDY/NEAR TERM IMPLEMENTATION

- New Transit Connector from Earlington Heights to Airport Area
- SR 836/SR 112 New Connector Expressway
- Tri-County Rail Station serving Terminal Area

CATEGORY 2b: FURTHER STUDY/LONG TERM IMPLEMENTATION

- Metrorail System Expansion including:
  1) East-West line from Downtown to 107 Ave.
  2) Connector from MIA to East-West line.

- MIA Multimodal Transportation Center Located to East of Airport Linking:
  1) Metrorail
  2) Tri-County Commuter Rail
  3) High Speed Rail
  4) Surface Bus



LEGEND

- FREEWAY
- SURFACE STREET
- EXISTING INTERCHANGE
- PROPOSED INTERCHANGE
- EXISTING PARTIAL INTERCHANGE
- PROPOSED PARTIAL INTERCHANGE
- PROPOSED MODIFIED INTERCHANGE
- PROPOSED GRADE SEPARATION
- EXISTING RAIL
- FUTURE RAIL

IMPLEMENTATION PRIORITIES

- CATEGORY 1: IMMEDIATE IMPLEMENTATION
- CATEGORY 2a: NEAR TERM IMPLEMENTATION
- CATEGORY 2b: LONG TERM IMPLEMENTATION

NOTE: CORRIDOR ALIGNMENTS AND INTERCHANGE LOCATIONS ARE FOR GRAPHIC ILLUSTRATIVE PURPOSES ONLY AND DO NOT REFLECT FINAL ALIGNMENTS.

FIGURE S-1

RECOMMENDED IMPROVEMENTS

I. INTRODUCTION

BACKGROUND

The Miami International Airport (MIA) Transportation Access Study has been conducted recognizing MIA both as an important air carrier airport from a statewide, national and international perspective and also as a major traffic generator in South Florida. Projected growth in international, domestic and commuter air travel will place continued demands on MIA for both air passenger and air cargo services.

MIA is also an important regional employment center in South Florida providing:

- Ground support for MIA passenger terminal operations
- Ground support for MIA air cargo operations
- Headquarters, regional office and maintenance facilities for major airline companies
- Aviation-related services (rental cars, lodgings, restaurants, etc.) and support industries (machine shops, uniform suppliers, etc.).

On an average day the Miami International Airport serves nearly 70,000 air passengers and 2,200 tons of air cargo. By the year 2015 these service levels are expected to increase to nearly 140,000 air passengers and 4,200 tons of air cargo per day, representing increases in passenger traffic of 100 percent and in air cargo of 90 percent. [1]

Urban Dade County is a rapidly-growing area and is expected to place increased demands on roadways in the MIA area to serve both airport and non-airport related traffic. Ground access to the MIA complex is a critical factor in the growth of aviation in South Florida. Roadways and mass transit systems in Dade County must be able to serve both the growing need for access to the MIA complex and the increasing non-airport related traffic demands brought about by growth in development in Dade County.

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[1] MIA Aviation Systems Plan, KPMG Peat Marwick, February, 1986

The Miami International Area Transportation Study focuses on developing recommendations which will provide additional system capacity by implementing capital improvements to the highway and transit systems to reduce delays, eliminate capacity restrictions and provide alternative travel paths.

Figure I-1 shows that the MIA Transportation Study area is bounded by NW 7 Street on the south, NW 37 Avenue on the east, NW 36 Street on the north, and the Palmetto Expressway (SR 826) on the west. Some of the data presented in this report extends beyond this boundary but is important to the analysis of existing and future transportation needs within the MIA area.

This Final Report has five main chapters. Chapter II describes the transportation study planning process by which the MIA Transportation Study was developed. Chapter III analyzes the existing travel characteristics of the MIA study area. Chapter IV forecasts and analyzes future traffic circulation. Chapter V describes the formulation and assessment of alternative transportation systems. Chapter VI contains the short range and long range transportation improvement recommendations resulting from the MIA Transportation Study.

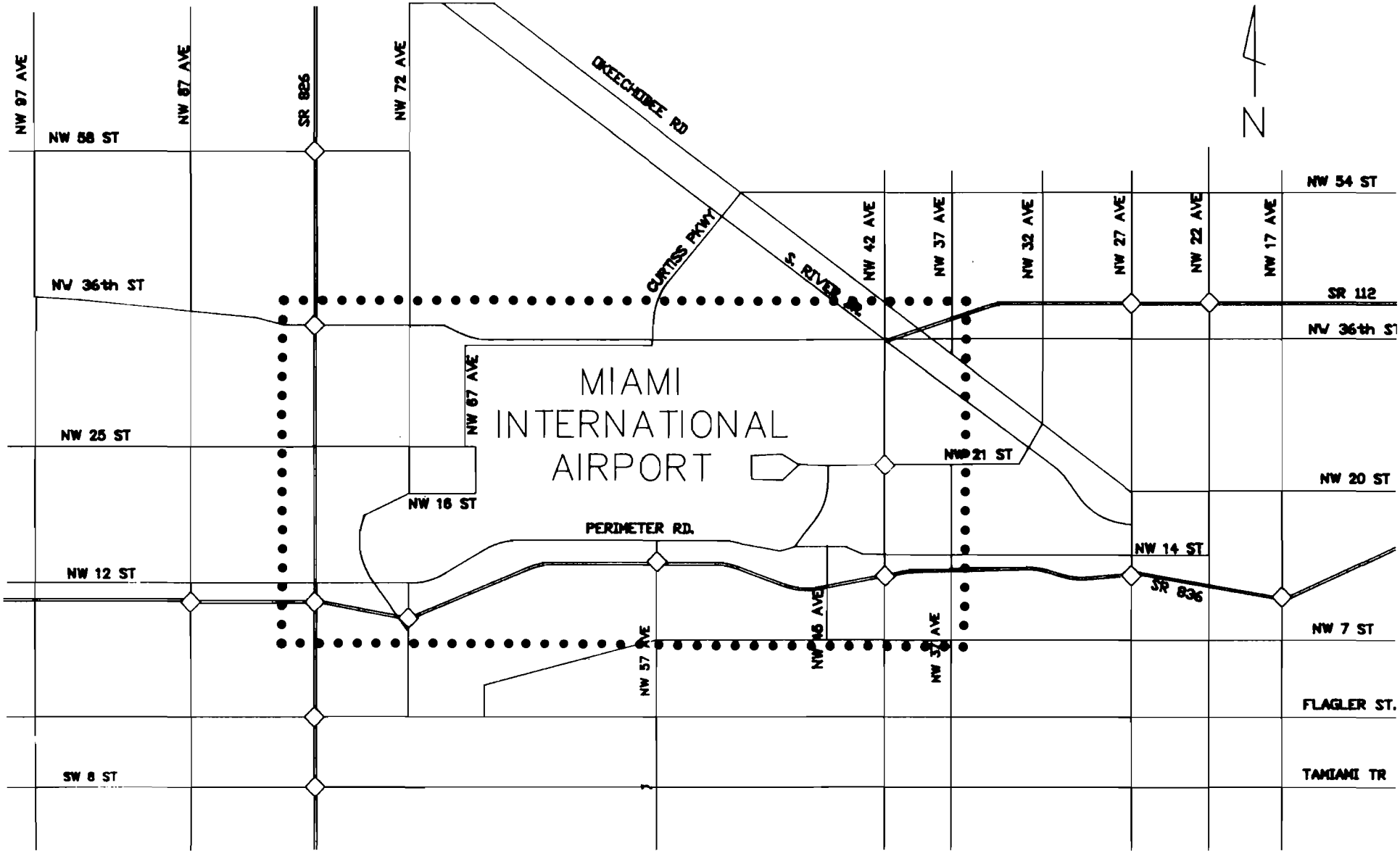


FIGURE I–1
M.I.A. STUDY AREA

II. TRANSPORTATION STUDY PLANNING PROCESS

This chapter describes the organization and technical methodology employed in conducting the Miami International Airport Transportation Study.

ORGANIZATION

The study was conducted cooperatively by the Metro Dade County Metropolitan Planning Organization (MPO), the Metro Dade County Aviation Department (DCAD) and the Florida Department of Transportation. Consulting services were furnished by Frederic R. Harris, Inc.

The study was guided by a Steering Committee comprised of representatives from the following agencies:

Metro Dade County MPO
Metro Dade County Aviation Department
Metro Dade County Public Works Department
Metro Dade County Planning Department
Metro Dade County Transit Agency
Florida Department of Transportation - District VI

Project Management was accomplished by the Metro Dade County MPO.

TECHNICAL METHODOLOGY

The MIA Transportation Study consisted of six tasks:

1) Data Collection
2) Model Development
3) Facility Analysis
4) Alternatives Formulation
5) Alternatives Analysis
6) Plan Formulation

Each of these tasks was conducted under the guidance of the Steering Committee.

Data Collection

During this task data and information were collected for use in subsequent study tasks. These data include:

- o Traffic data
- o Transportation supply characteristics
- o Modeling data and information
- o Plans, programs and studies
- o Interview information

The Data Collection phase was reported in Technical Memorandum 1: EXISTING CONDITIONS and is summarized in Chapter III of this report.

Model Development

The MIA Transportation Study was conducted using the available MUATS (Miami Urban Area Transportation Study) models on the FDOT computer system.

The consultant, with guidance from the Metro Dade County Planning Department, prepared Long Range (Year 2010) and Interim Range (Year 1992) land use data sets for input to the MUATS models. The consultant also developed:

1) A Year 1992 highway network data set within the MIA study area reflecting the 1988-1992 Transportation Improvement Program.
2) A Year 2010 highway network data set within the MIA study area reflecting the Metro Dade Long Range Plan as it had been revised in July, 1987. The existing and long range transit network data sets reflecting local, express and feeder bus service plus current Metrorail and Metromover systems and anticipated Metromover extensions already existing in the MUATS modeling package and were used in the MIA Transportation Study.

Facility Analysis

Using input data sets and the MUATS models on the FDOT computer, the consultant prepared and analyzed Year 2010 and Year 1992 travel projections.

These analyses provided the basis for formulating and assessing alternative transportation improvements within the MIA study area.

The results of the model development and facility analysis are reported in Technical Memorandum 2: **FUTURE CONDITIONS** and are summarized in Chapter IV of this report.

Alternatives Formulation

Using the results of the Facility Analysis the Steering Committee investigated a variety of alternative practical solutions to the transportation needs of the MIA study area. Components of the alternative systems included:

- o Traffic circulation modifications
- o Intersection expansion
- o Additional roadway lanes
- o Grade separations
- o Interchange modifications
- o Transit enhancements
- o Rail extensions
- o Transportation systems management solutions

Throughout the formulation of these alternatives the Steering Committee considered:

- o Engineering feasibility and constraints
- o Environmental constraints and requirements
- o Access to MIA
- o Compatibility with neighboring land use
- o Socio-economic impacts on neighboring businesses and the community.

Alternatives Analysis

During this task the consultant provided analytical information with which the Steering Committed evaluated the alternatives. This information was developed

at both the subarea and microscale levels.

The subarea analysis encompassed the entire MIA study area and addressed the following factors:

- o Projected costs
- o Selected system measures of effectiveness (e.g. level of service, delay, etc.)
- o Operational impacts
- o Environmental, land use and social impacts

The microscale analysis was conducted on selected system components and included such factors as:

- o Development of sketch-level design options
- o Microanalysis of design options

The results of the alternatives assessment were reported in Technical Memorandum 3: FORMULATION AND ASSESSMENT OF ALTERNATIVES and are summarized in Chapter V of this report.

Plan Formulation

Following the assessment of alternatives, the Steering Committee identified possible improvements for recommendation to the Metropolitan Planning Organization for inclusion in the transportation plan for Dade County. Relative priorities were assigned to the proposed improvements according to the following categories:

- o Category 1: Improvements to be implemented as soon as plan production and funding permits.
- o Category 2a: Improvements recommended for further study and near-term implementation.
- o Category 2b: Improvements recommended for further study and long-term implementation.

III. EXISTING TRAFFIC CIRCULATION ANALYSIS

The initial task of the Miami International Airport Transportation Study was to collect and analyze information to:

- o define the existing travel conditions in the Airport area.
- o define the programmed and long-range transportation improvements in the study area.
- o define future development in the study area.
- o make preliminary assessments of future travel conditions and required improvements to the Airport area transportation system.

These analyses are documented in detail in Technical Memorandum 1: EXISTING CONDITIONS.

EXISTING TRAVEL CONDITIONS

The data collection effort in the immediate area surrounding the Miami International Airport (MIA) was conducted to analyze and assess travel characteristics and traffic patterns during weekday operations. To evaluate current traffic operations within the Miami International Airport study area the following types of traffic data were collected:

- o 24-hour bi-directional traffic counts.
- o 4-hour turning movement counts
- o 8-hour vehicle classification counts
- o Peak and off-peak period travel time and delay runs

These data were used both to identify general travel patterns in the MIA area and to develop specific traffic analyses and factors for planning and design.

The specific analyses conducted include:

- o Signalized intersection capacity analysis
- o Travel time and delay analysis
- o Analysis of 24 hour traffic volumes

- o Analysis of truck traffic
- o Seasonal traffic variations
- o Traffic accident analysis

Signalized Intersection Capacity Analysis

Signalized intersection capacity analyses were conducted for both the morning and evening peak hours. Of the 18 signalized intersections analyzed, 11 were found to experience peak hour traffic conditions at Levels of Service E or F as defined by the 1985 Highway Capacity Manual. These operating conditions are beyond those which could be corrected by revising traffic signal timing or phasing or by arterial traffic signal coordination.

Travel Time and Delay Analysis

Travel time and delay analyses were conducted on 9 arterial and expressway routes to identify congested locations as measured by slow speeds and excessive delays. These studies were conducted during both the morning and evening peak hours and during off-peak periods. The travel time and delay analysis demonstrates that arterial roadways in the MIA area experience, on the average, a 24 percent reduction in speeds between off-peak (uncongested) and peak hour (congested) operations.

Figure III-1 shows the existing congested intersections and roadway links in the MIA Transportation Study Area.

24 Hour Traffic Volumes

The peak hour percentage typically found on urban arterial roadways is between 8 and 10 percent. The 24-hour traffic counts show that many arterial roadways within the MIA study area operate with 8 percent or less of the daily traffic occurring during the peak period. This analysis suggests that, even though roadways in the MIA area are congested during the peak hours, heavy traffic volumes persist throughout the day. Thus, MIA area roadways are subject to congested operations for more hours of the day than just the peak periods.

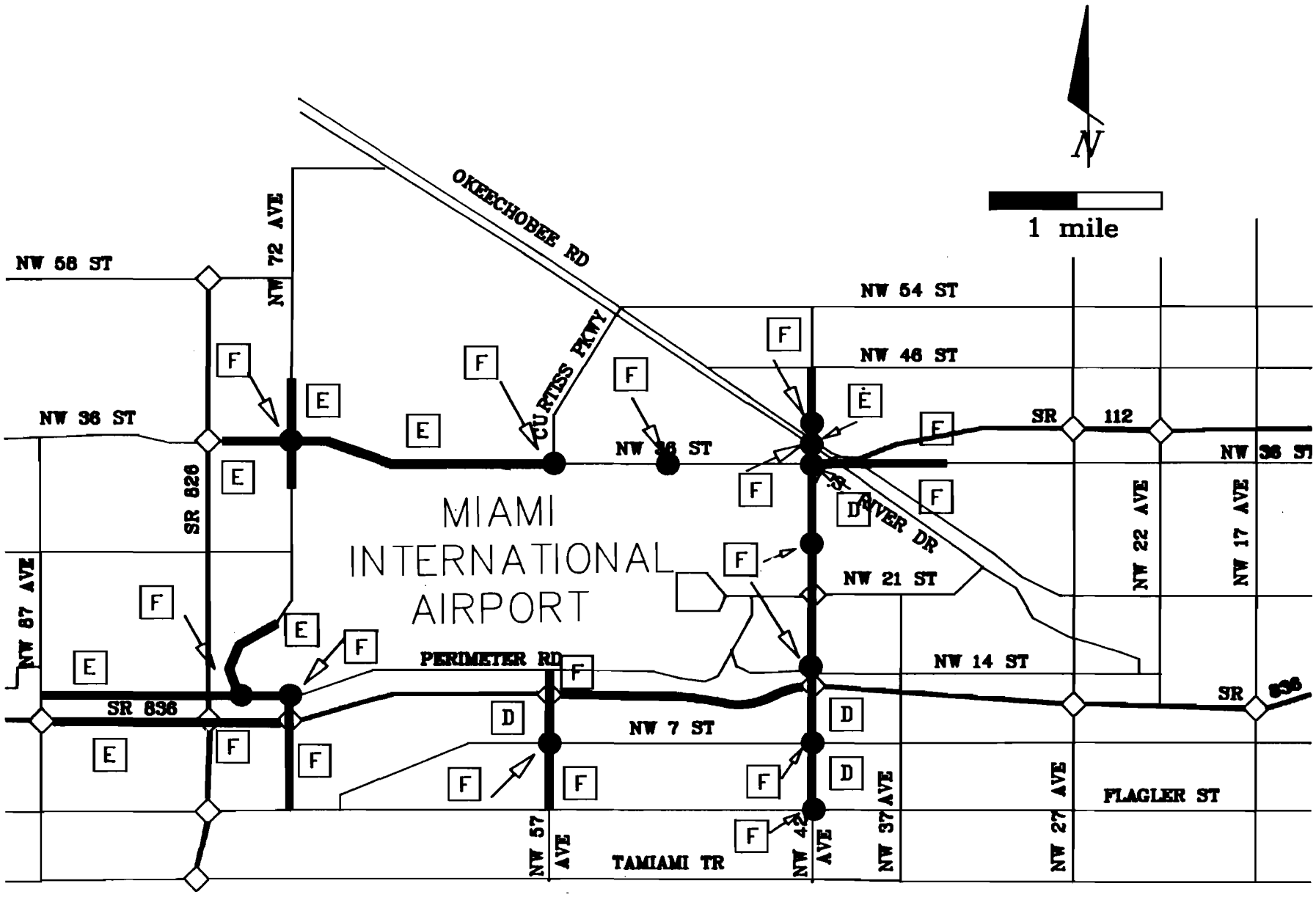


FIGURE III–1 EXISTING CONGESTED ROADWAYS

Truck Traffic

Technical Memorandum 1: EXISTING CONDITIONS shows the locations of heavy truck movements serving the MIA air cargo area and the industrial areas.

Seasonal Distribution of Traffic

Roadways in the MIA area experience significant seasonal variations in traffic with the peak traffic volumes in February being approximately 30 percent higher than the lowest volumes in September.

Seasonal traffic characteristics near the MIA tend to parallel those for Dade County as a whole but to less of an extreme. The Dade County average tends to be higher in the peak months and lower in the off-peaks than for conditions found near the Airport.

Traffic Accident Analysis

Traffic accidents occurring in the MIA area between 1984 and 1986 were analyzed. These data show approximately:

- 1,400 to 1,600 accidents per year
- 1,000 to 1,200 injuries per year
- 6 fatalities per year
- Annual financial loss of about 13 million dollars

LeJeune Road has a higher accident rate (i.e., accidents per mile and injuries per mile) than other roads in the study area.

PUBLIC TRANSPORTATION

The MIA terminal and other destinations within the MIA area are served by Metrobus routes. There are five bus routes which serve the MIA terminal directly and three others which operate in the MIA area. Direct service is available from the MIA area to most areas of Dade County except far west Dade.

Technical Memorandum 1: EXISTING CONDITIONS presents information pertaining to the frequency of service, the routes and destinations served and, in particular, the bus service provided from MIA to the Metrorail stations. In general, a bus trip from MIA to a Metrorail station takes about 20 to 30 minutes and service is provided at 20, 30 or 60 minute intervals during peak periods.

Using on-board bus survey data provided by the Metro Dade County Transit Agency it was determined that 190 bus riders enter and leave the MIA area during the morning peak period (7:00 to 9:00 AM). Also, 251 bus riders enter and leave during the evening peak hour (4:00 to 6:00 PM). Approximately 65 percent of these riders travel to and from the east via NW 36 St.

LAND USE

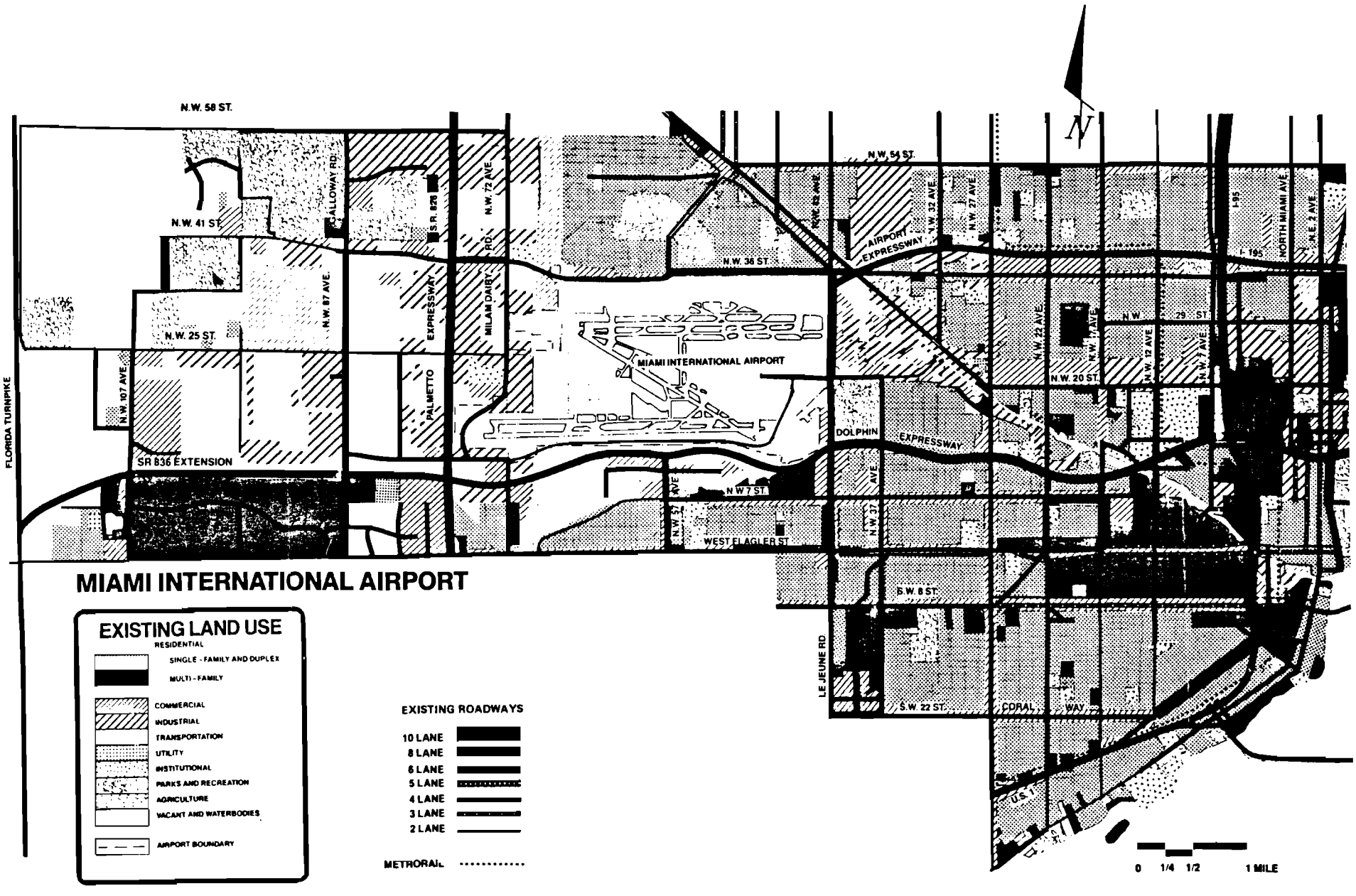
Land use data was collected both to describe existing activities and also to form the basis for projecting future travel demands in the MIA area. Figures III-2 and III-3 show the existing and future MIA area land uses, respectively. Comparing Figures III-2 and III-3 shows that land use patterns in already-developed areas are assumed to remain relatively constant. However, presently vacant land to the west and southwest of the airport is expected to experience significant infill of commercial and industrial uses.

These forecasts suggest that, without transportation system improvements, current traffic conditions in the MIA area will deteriorate significantly. Substantial increases in both employment and population are expected to lead to greater mixing of Airport and non-Airport traffic on area roadways.

INTERVIEWS

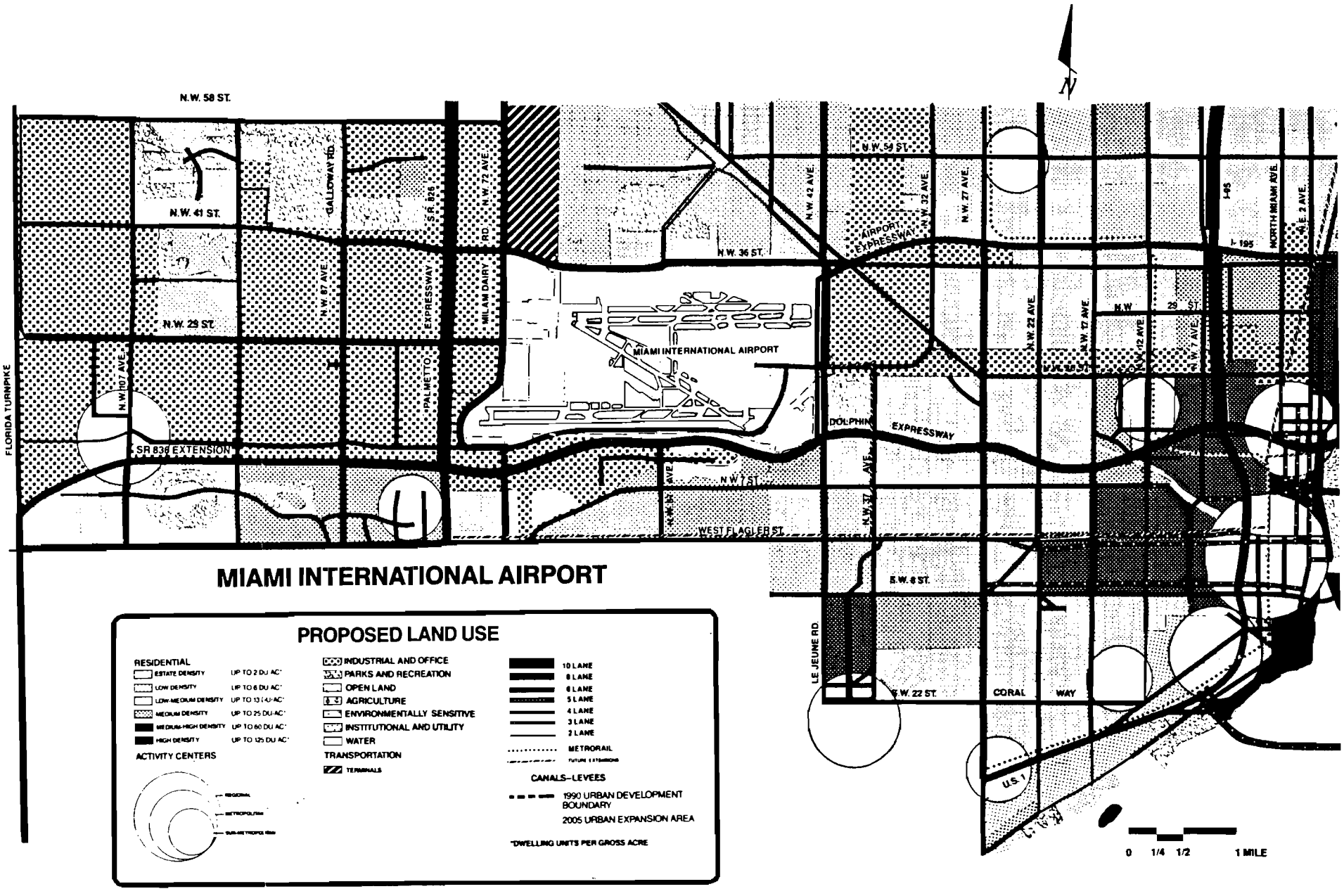
Interviews were conducted with businesses based within the MIA area and with businesses that require access to the Airport. The purpose of these interviews was to:

- Identify transportation problems and concerns of Airport businesses
- Assess the feasibility of long-range transportation improvement alternatives



Source: Dade County Aviation System Plan

FIGURE III–2 EXISTING AIRPORT AREA LAND USE



Source: Dade County Aviation System Plan

FIGURE III-3 FUTURE AIRPORT AREA LAND USE

- o Identify transportation improvements which are neither programmed nor planned.
- o Gather information related to transportation improvement projects in the Airport area.

Interviewees included trucking companies, charter bus and rental car operators, airlines and railroad companies.

Technical Memorandum 1: **EXISTING CONDITIONS** describes the conduct of the interviews and the responses received. The interviews were conducted independently but several respondents identified common concerns related to:

- o Identified transportation problems
- o Behavior of travelers in the MIA area
- o Suggested solutions

Identified Problems

Every major roadway in the MIA area was identified as experiencing severe traffic congestion problems. Especially cited were the following:

- o LeJeune Road
- o NW 36 Street
- o SR 836
- o NW 72 Avenue
- o NW 25 Street
- o Westbound ramps from SR 112 to westbound NW 36 Street
- o The MIA internal circulation system

Particular problem intersections identified included:

- o LeJeune Road/NW 14 Street/SR 836 ramps
- o LeJeune Road/Eastern Airlines employee parking lot entrance
- o LeJeune Road/NW 36 Street
- o NW 36 Street/NW 72 Avenue
- o NW 72 Avenue/NW 25 Street

- o NW 72 Avenue/Perimeter Road
- o NW 37 Avenue and NW 21 Street

LeJeune Road at the CSX Railroad crossing was identified as being severely congested. Other traffic problems within the terminal area were also noted.

Travel Behaviors

The interviewees also identified several alternative routes which are currently used in order to avoid congested traffic on main roads. These include:

- o Perimeter Road is used as an alternate to SR 836.
- o NW 14 Street is used to leave the Airport area as an alternate to NW 21 Street.
- o The NW 37 Avenue interchange is used as an alternate to LeJeune Road as a means to access SR 836.
- o Northbound LeJeune Road drivers tend to make U-turns at NW 14th Street, across southbound LeJeune Road traffic, to the westbound SR 836 ramp instead of using the loop ramp on the right. This maneuver is made to avoid congestion on the loop ramp. This situation was mentioned a number of times as a safety problem.
- o Eastern Airlines employees predominantly use the LeJeune Road exit from the employee parking lot.
- o About 10 percent of the employees of the interviewed companies were estimated to use carpools or transit.

These behaviors, which contribute to capacity or safety deficiencies, are important indicators of areas where traffic improvements are needed.

Improvements Suggested by Interviewees

The interviewees offered suggestions for transportation improvements which may be able to address problems of congestion, mobility and safety, including:

- o Extend the SR 112 limited-access facility to SR 826.
- o Extend Metrorail into the passenger terminal area.

- o Improve NW 37 Avenue so that the Airport and SR 836 can be accessed from SR 112.
- o Restrict left turns from the northbound approach of LeJeune Road/Westbound SR 836 ramps/NW 14 Street.
- o Restrict U-turns from the southbound approach of this same intersection.
- o Construct a new SR 826 interchange at NW 25 Street.
- o Widen NW 25 Street to four lanes from the cargo area to NW 107 Avenue.
- o Make provisions for long trucks in the MIA cargo area.
- o Signalize the intersection of NW 72 Avenue and NW 25 Street.
- o Improve access to NW 74 Avenue.
- o Eliminate the at-grade CSX rail crossing at LeJeune Road.

These suggestions were considered in the formulation and assessment of alternatives portion of the MIA Transportation study.

TRANSPORTATION IMPROVEMENT PROGRAM

The Miami International Area Transportation Study recommendations are built upon the transportation improvements which have previously been programmed for implementation and upon those which are planned.

Programmed Transportation Improvements

Programmed improvements which are the responsibility of the Florida Department of Transportation or of Dade County were obtained from the 1987 Transportation Improvement Program (TIP) for Dade County. This document is a 5-year work program and identifies transportation improvements which are programmed for construction/implementation through Fiscal Year 1991. The projects contained in the TIP are high priority projects and can be considered to be in the implementation "Pipeline". The TIP is maintained and updated by the Metro Dade County Metropolitan Planning Organization.

Figure III-4 shows the programmed transportation improvements for primary and secondary roadways in Dade County as identified in the 1987 TIP. Additional information describing the project limits, type of work, phasing, cost and schedule can be found in Technical Memorandum 1: EXISTING CONDITIONS. These

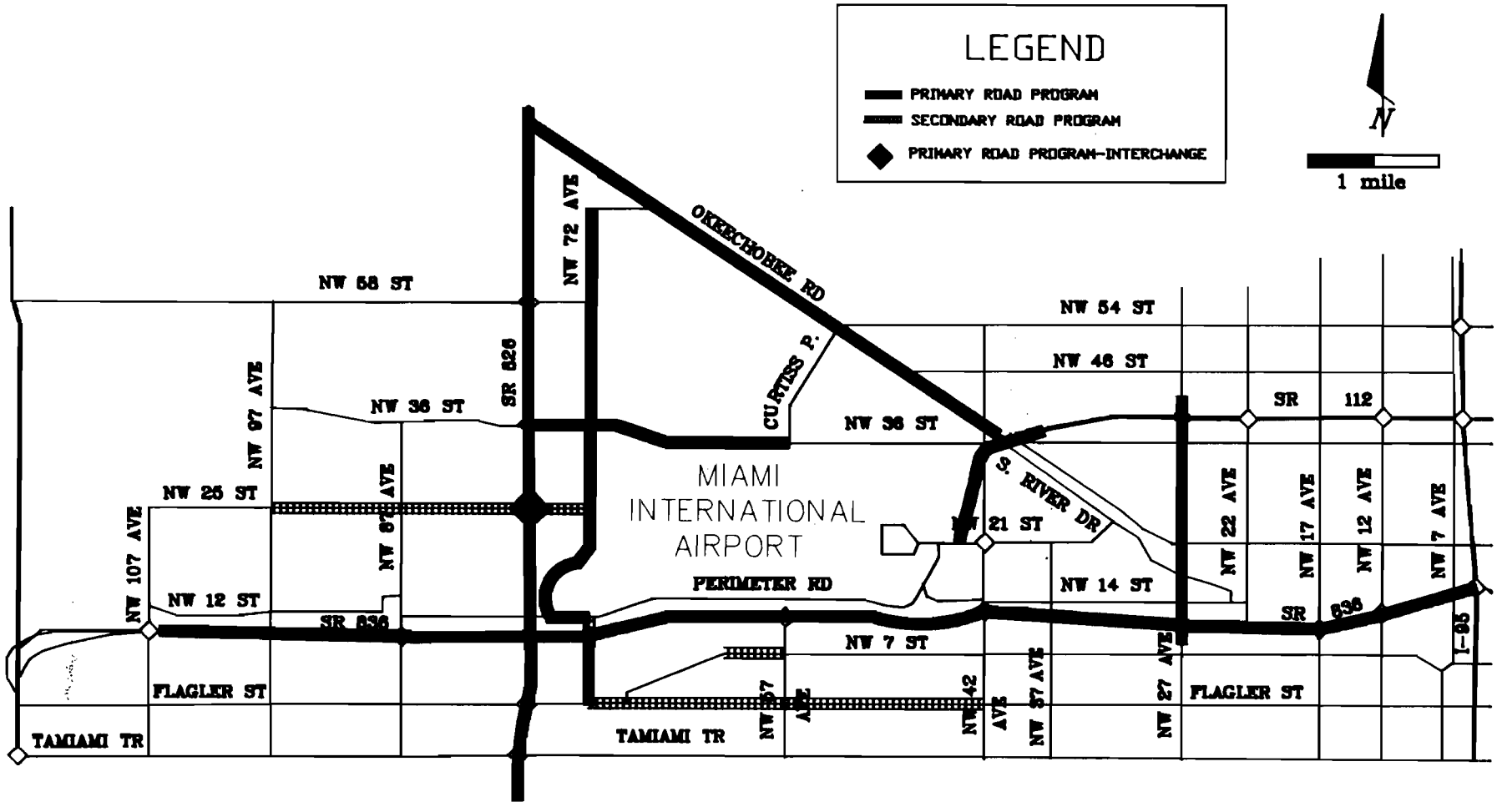


FIGURE III-4 PROGRAMMED IMPROVEMENTS (1987-1991)

improvements will improve the overall operation of the transportation system in the MIA area. Even improvements to parallel roads or to roads which may be located considerable distance from MIA can help to accommodate traffic demands and to alleviate traffic congestion in the MIA area.

Of particular interest are the programmed improvements for:

- NW 27th Avenue, which, once implemented, will help to unload traffic from LeJeune Road;
- The four lane direct connection from SR 112 to the Airport's entrance on LeJeune Road;
- NW 72nd Ave. (Milam Dairy Rd.) connection from NW 7th Street to NW 12th Street. (Note: this improvement was opened to traffic in 1988.)

These projects will ease traffic congestion on the north-south roadways adjacent to the Airport. There are no Metrorail improvements contained in the TIP within the MIA study area.

Planned Transportation Improvements

The Year 2005 Transportation Plan identifies long range road construction and transit capital improvement needs in Dade County. The Year 2005 Transportation Plan is maintained and updated by the Metro Dade County Metropolitan Planning Organization. The planned improvements are grouped in priority order as follows:

Priority 1: Planned for Implementation 1987 - 1991
Priority 2: Planned for Implementation 1992 - 1997
Priority 3: Planned for Implementation 1998 - 2001
Priority 4: Planned for Implementation After 2001

The planned transportation improvements in the MIA area for each of the four priority groups are shown in Figures III-5 through III-8. Figure III-9 shows the total highway construction planned for the MIA Transportation Study area.

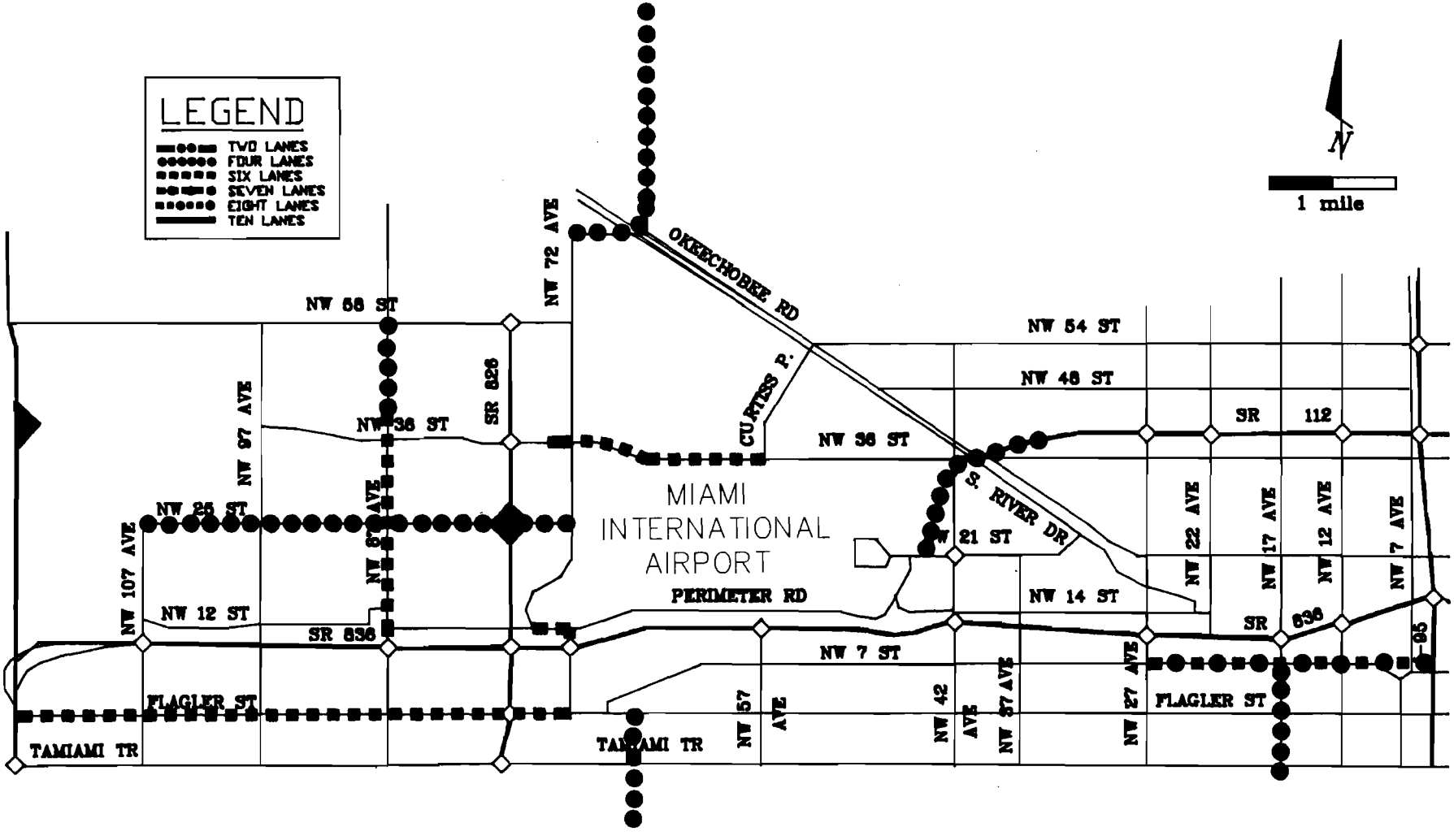


FIGURE III–5 PRIORITY 1: PLANNED IMPROVEMENTS

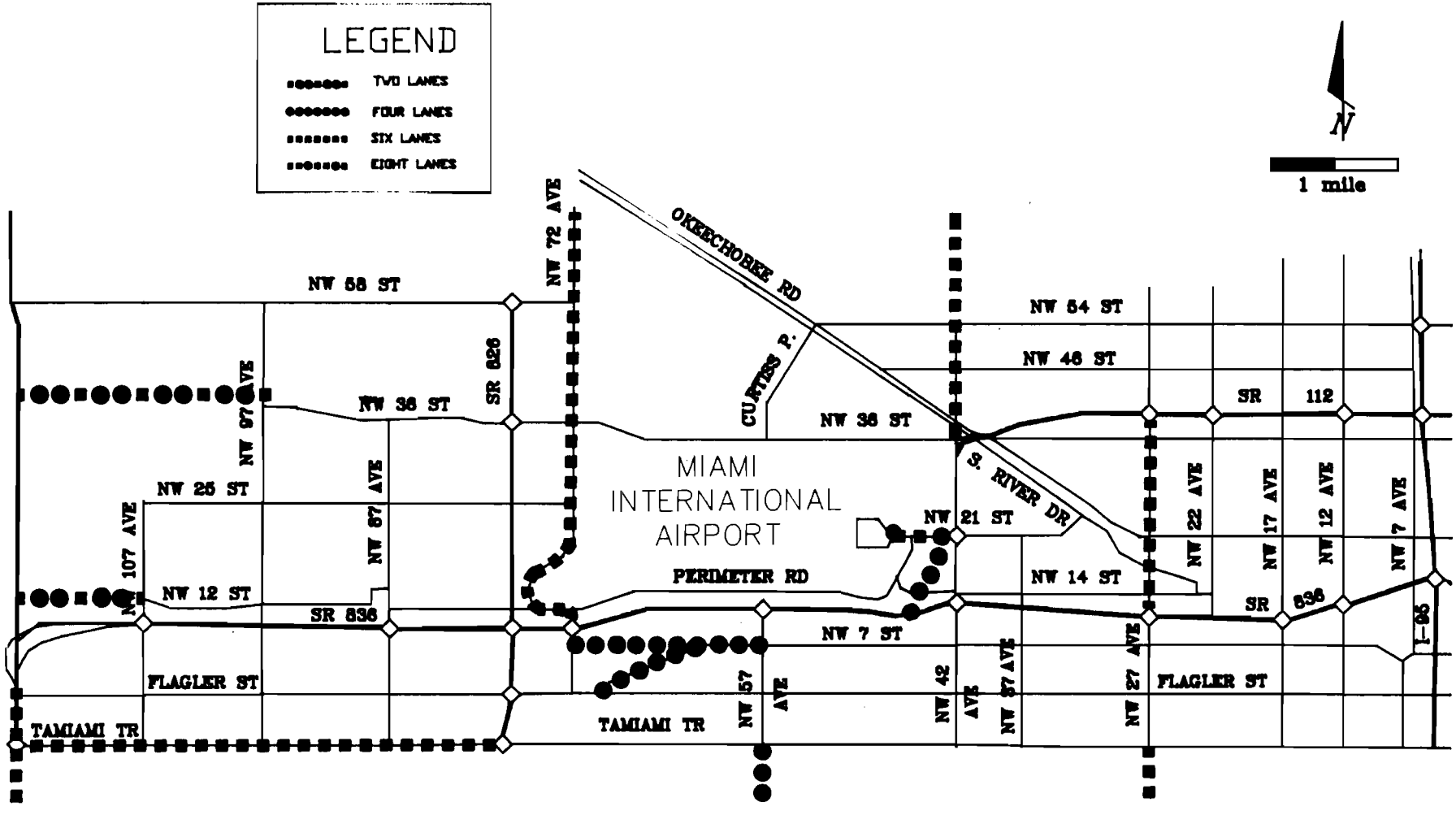


FIGURE III–6 PRIORITY 2: PLANNED IMPROVEMENTS

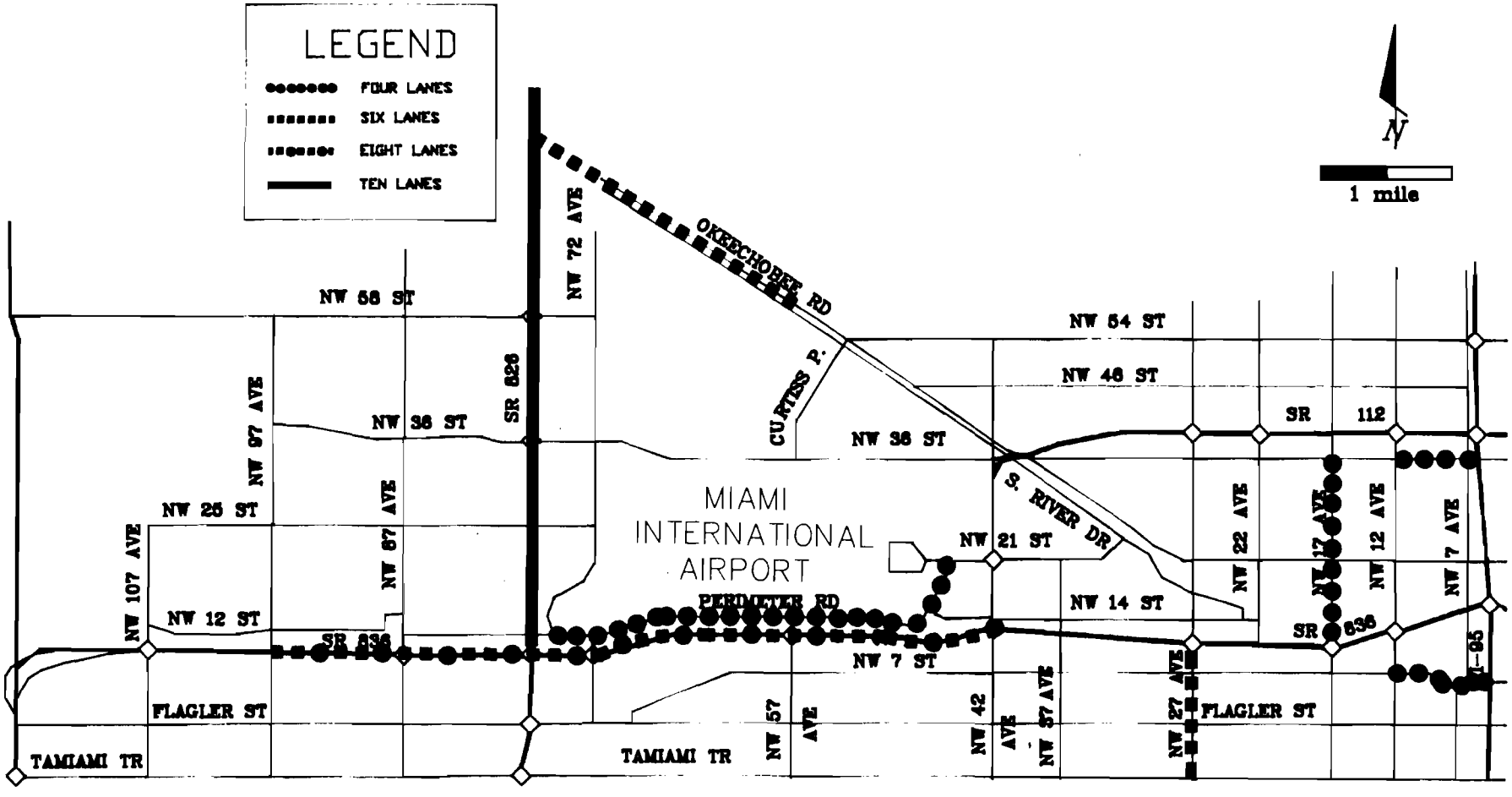


FIGURE III–7 PRIORITY 3: PLANNED IMPROVEMENTS

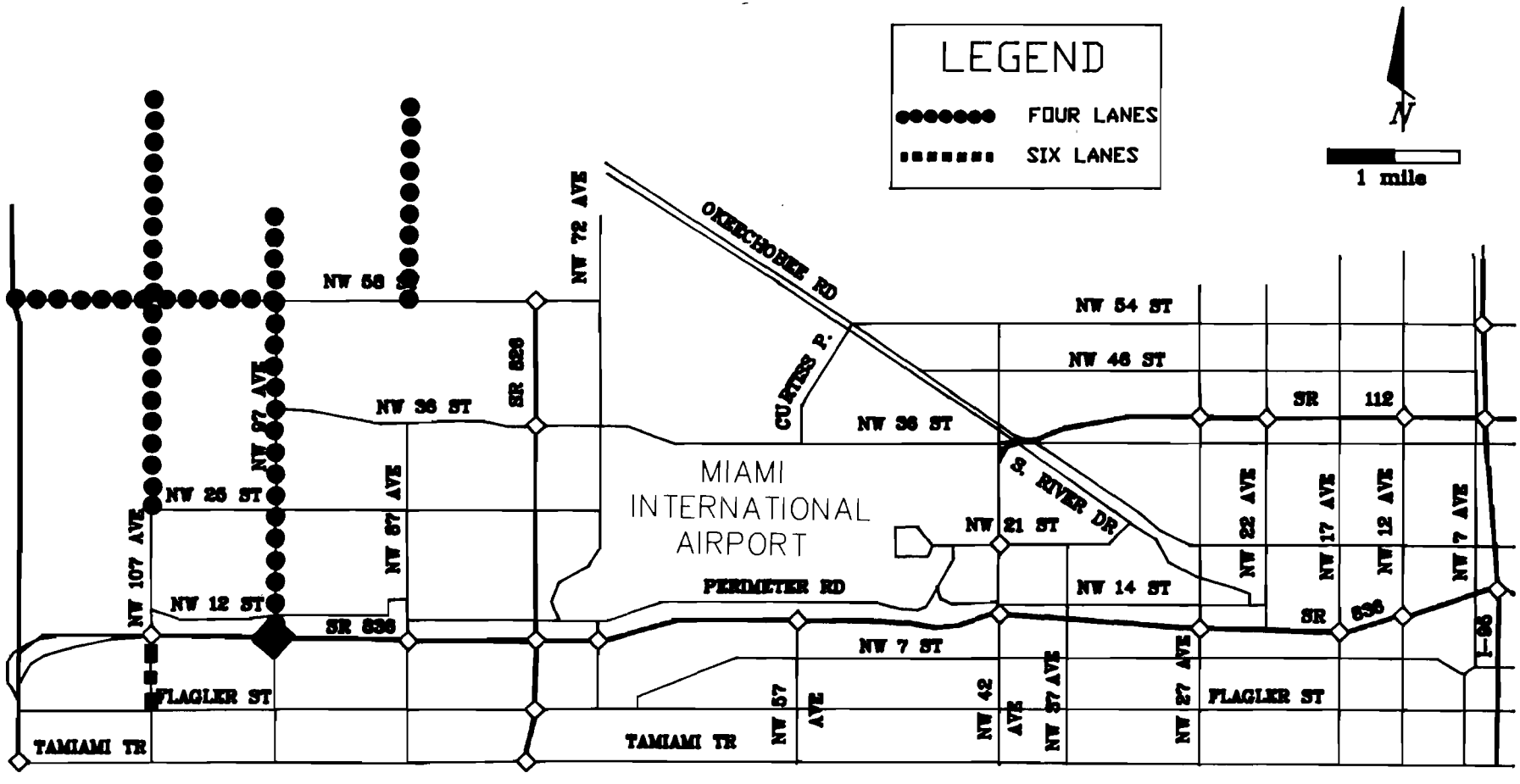


FIGURE III–8 PRIORITY 4: PLANNED IMPROVEMENTS

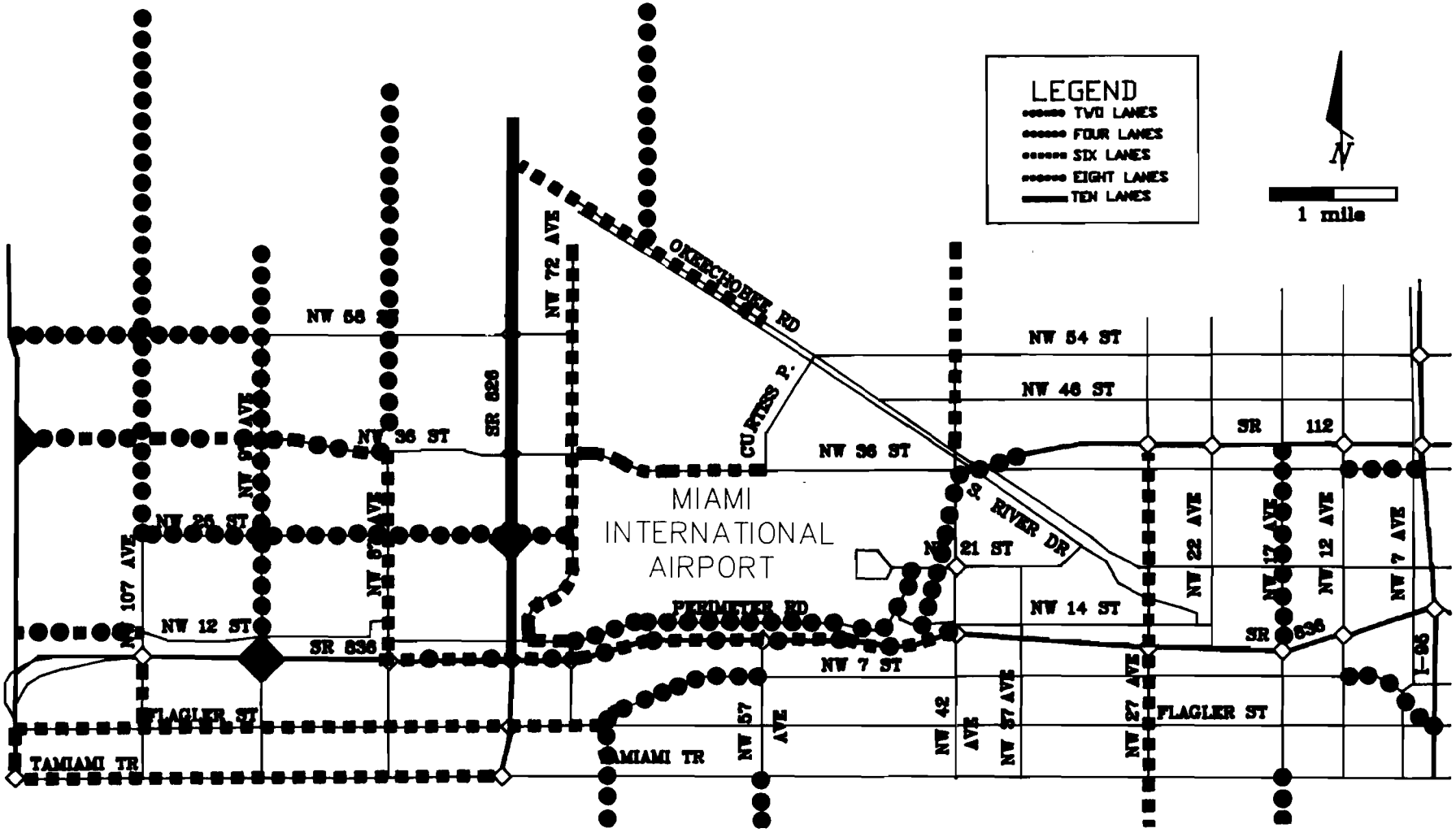


FIGURE III–9 TOTAL PLANNED HIGHWAY CONSTRUCTION

As can be seen, a number of road facilities in the MIA area are planned to be improved. Projects programmed for implementation by 1991 include the following:

- o SR 112 Airport access ramps
- o NW 36 Street widening west of NW 57 Ave.
- o Central Boulevard widening
- o NW 87 Avenue widening
- o NW 72 Avenue bridge at SR 836 (this project was completed in 1988)
- o SR 826 interchange at NW 25 Street
- o NW 25 Street widening

Other major Airport area improvements include:

- o SR 836 widening and HOV lanes
- o SR 836 Airport Access Ramps
- o SR 826 widening
- o Okeechobee Road widening
- o NW 72 Avenue widening
- o SW 67 Avenue widening
- o NW 27 Avenue widening

Also under consideration is a conceptual roadway which would link SR 836 and SR 112. Notable facilities not planned for improvement include NW 36 Street east of NW 57 Ave., SR 112 between LeJeune Road and I-95, NW 37th Avenue, and the intersection of NW 36th Street and LeJeune Road.

Figure III-10 shows the existing Metrorail system plus Metrorail Stage II extensions and the proposed Tri-County Commuter Rail system.

Additional information describing the project limits and type of work for planned improvements can be found in Technical Memorandum 1: EXISTING CONDITIONS.

CONCLUSIONS

Based on the collection and analysis of data pertaining to existing travel and programmed and planned transportation improvements, the MIA Transportation Study stated several observations which were considered in later phases of the study.

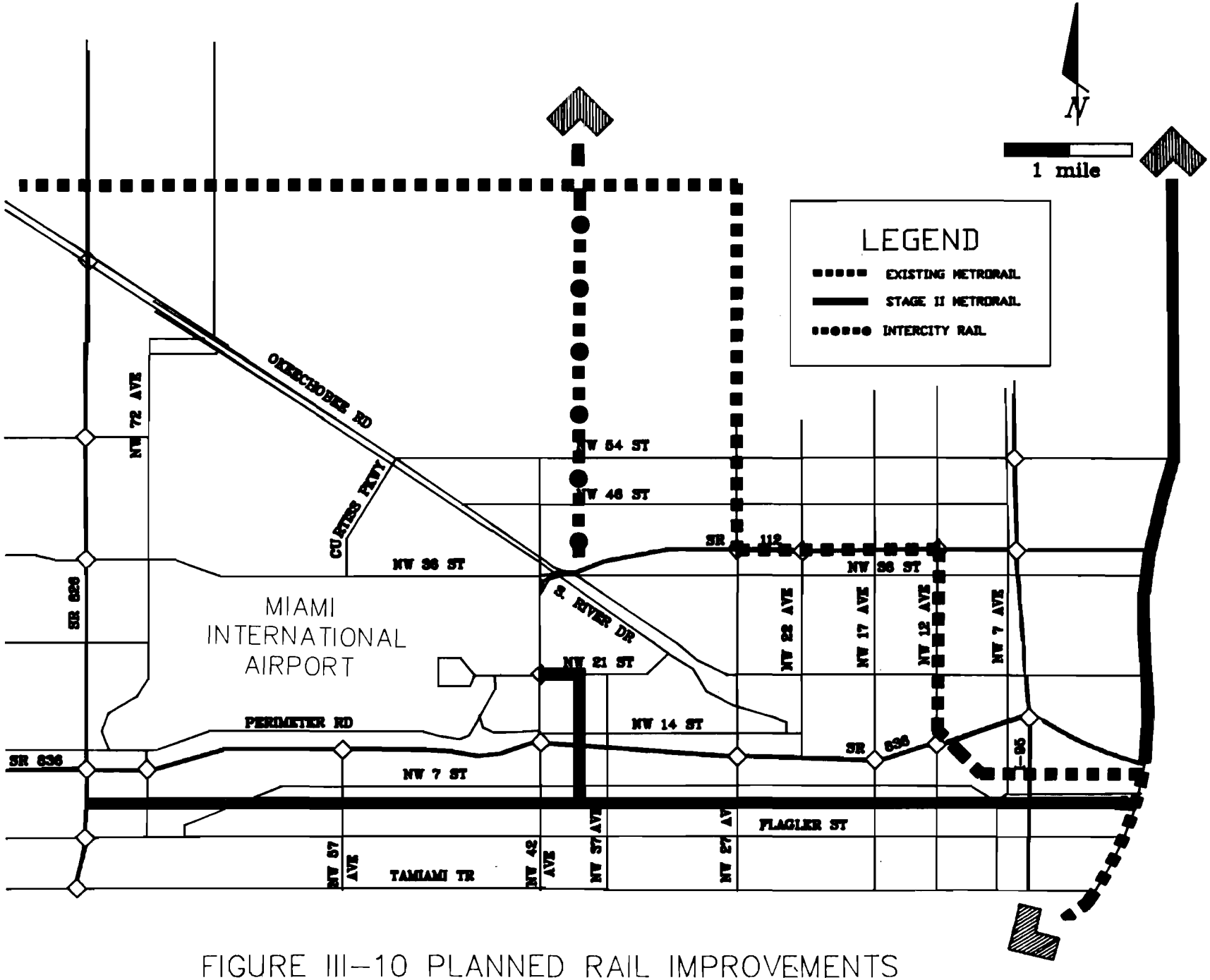


FIGURE III–10 PLANNED RAIL IMPROVEMENTS

Overall Perspective on MIA Area Travel

Travel within and around the Airport complex is generally perceived to be time-consuming, difficult, frustrating and potentially hazardous.

The data gathered in this study confirms this perception and identifies several contributing factors including:

- The Airport's proximity to downtown Miami.
- The Airport's location within a major travel corridor between a large employment center and outlying residential areas.
- The influence of MIA as a major employment center
- The discontinuity of north-south and east-west roadway facilities due to MIA, the Miami River, SR 836, SR 112, the Tamiami Canal and SR 826.
- At-grade railroad crossings to the east and north of MIA
- Numerous pedestrian movements
- Large numbers of driveways intersecting arterial streets
- Heavy intersection turning movements

The area experiences a diverse mix of traffic including commuters destined for the area, commuters traveling through the area to other destinations, large truck movements, vehicles serving MIA activities and vehicles transporting airline passengers to and from the Airport. The traffic problems are not confined to the peak hours. Road facilities service large volumes of traffic starting at about 6:00 AM and continuing to 8:00 PM or later.

There is evidence that, due to the difficulty getting to and around MIA, travelers may be changing their established travel patterns by starting their work trips either earlier or later than desired or by seeking alternative routes such as Perimeter Road or NW 37 Avenue to avoid congestion. Travelers are also using alternative modes of travel. Transit utilization in the area is not particularly high although there is some indication that transit and carpooling may account for upwards of 10 percent of commute travel to the MIA area.

Area Growth

The Airport area, and particularly the West Airport area is anticipated to experience a large increase in employment. The West Airport area is expected to double its employment by Year 2005, suggesting that east-to-west commute movements through the area might be expected to increase substantially.

MIA employment is also anticipated to double by Year 2005. The limited number of access points to the Airport terminal area as well as to the west Airport property suggests that traffic problems may continue to worsen even in light of the extensive construction planned for area roads.

Area Transportation Improvement Programs

Nearly all road facilities in the MIA area are planned or programmed for improvement. Possibly the most beneficial improvements for the short term will be the NW 72 Avenue bridge over SR 836 and the SR 112/Airport connector ramps.

In the long term, additional benefits will be realized through completion of the west Airport area road system including an additional SR 826 interchange at NW 25 Street. The Airport connector ramps to SR 836 will also benefit a major congestion point in the area; LeJeune Road at SR 836. Improvements to NW 72 Avenue and to Perimeter Road will also provide significant benefits.

Safety

The primary safety hazard in the area is LeJeune Road, in particular, the southbound weaving area south of SR 112, the signalized intersection with NW 14 Street, the Eastern Airlines employee parking lot entrance near NW 29 Street, and the NW 36 Street intersection area. The weaving area problem will be eliminated with the SR 112/Airport connector ramps, but the other problems will require additional improvements not as yet programmed.

IV. FUTURE TRAFFIC CIRCULATION ANALYSIS

Projections of travel demand were prepared for the years 1992 and 2010. These are countywide projections and take into account the anticipated growth of Dade County, programmed and planned roadway construction and transit service improvements.

The effects of these countywide projections on the MIA study area were analyzed and show that the MIA area will continue to be a major regional focal point for ground travel in South Florida. Approximately 11 million vehicle-miles of travel are projected to occur daily in the MIA area by the year 2010, an increase of nearly 30 percent over present levels.

Significant transportation improvements, beyond those already programmed and planned will be required to improve travel conditions in the MIA area over those which presently exist.

This chapter reviews the methodology that was used to forecast travel demand in the MIA study area. The forecast results are also presented and evaluated. These forecasts are documented in detail in Technical Memorandum 2: FUTURE CONDITIONS.

FORECAST METHODOLOGY

Travel forecasts for the Years 1992 and 2010 were built upon 1986 socio-economic and travel characteristics of Dade County. The travel models used by Dade County and the Florida DOT in developing and updating the Miami Urban Area Transportation Study (MUATS) were used to prepare the MIA travel demand forecasts.

Model simulations were prepared for three forecast years:

- The 1986 scenario reflected existing conditions.
- The 1992 scenario simulated the next 5 years of growth plus completion of all roadway construction projects contained in the Metro-Dade 1988-1992 Transportation Improvement Program (TIP).

- o The 2010 scenario simulated future growth plus buildout of the urban area long range transportation plan as it had been updated in July, 1987.

All of the data sets used in the travel forecasts were either developed or updated by the consultant with guidance and direction from the Metro Dade County Planning Department staff.

Use of the countywide MUATS models insures that the results of the MIA Transportation Study are consistent with ongoing regional transportation planning. For purposes of this study, a "windowing" technique was employed to focus the countywide modeling results on the immediate MIA area. This technique is described in Technical Memorandum 2: FUTURE CONDITIONS.

Socio-Economic Data

The principal inputs to the travel forecasts are the employment and the population of the study area. Table IV-1 shows the projected values for the MIA area. This table shows that the employment of the MIA area is expected to grow by 64 percent between 1986 and 2010. The population is expected to grow by 58 percent. Technical Memorandum 2: FUTURE CONDITIONS breaks these MIA area totals down to eight subareas and shows that the employment and population and growth rates in the areas to the west and southwest of the Airport are significantly greater than for the overall MIA area.

Table IV-1

Projected MIA Area Employment and Population (1986-2010)

Year	Employment	% Increase Over 1986	Population	% Increase Over 1986
1986	104,164	--	85,094	--
1992	143,665	+38%	108,342	+27%
2010	170,757	+64%	134,051	+58%

Highway Network Data

The 1992 highway network reflected completion of all roadway improvement projects contained in the 1988-1992 Transportation Improvement Program for Dade County. This translates to approximately 94 million dollars in roadway

improvements countywide over a 5 year period.

The Year 2010 highway network reflected completion of all roadway improvements contained in the adopted long range transportation plan for Dade County. These improvements represent more than 3 billion dollars of roadway improvements countywide.

Transit Network Data

The transit networks used in the 1992 and 2010 simulations contained the same level of bus service as contained in the 1986 transit network. This level of service is reasonably close to the actual AM service provided by the MDTA system in 1986 and reflects service changes resulting from the Network '86 program. The only significant difference between the three transit networks used in the 1986, 1992 and 2010 travel demand simulations was that the year 2010 network contained the Omni and Brickell extensions to the Metromover system. No additional Metrorail service was contained in the year 2010 transit network.

FORECAST RESULTS AND EVALUATION

The inputs to the travel demand forecast are, as described above, socio-economic data, highway network and transit network. The outputs are simulations of vehicle trip loadings on the highway network and transit passenger loadings on the transit network.

Highway Travel Forecasts

Table IV-2 summarizes selected key systemwide indicators of highway travel within the MIA study area resulting from the 1986, 1992 and 2010 travel demand simulations. These comparisons show that key travel indicators will experience substantial increases between 1986 and 2010, particularly those pertaining to travel time and delay. These statistics suggest an increase in travel in the MIA area resulting in reduced travel speeds and increased delays. Table IV-2 also shows that the increase in the supply of transportation facilities, as measured in lane-miles, will not keep pace with the forecasted travel demand.

TABLE IV-2 MIA AREA HIGHWAY TRAVEL FORECAST SUMMARY

FORECAST YEAR	VEHICLE-MILES OF TRAVEL (MILLION)	% INCR OVER 1986	VEHICLE-HOURS OF TRAVEL (THOUSAND)	% INCR OVER 1986	CONGESTED DELAY (THOUSAND-HOURS)	% INCR OVER 1986	HIGHWAY LANE MILES	% INCR OVER 1986
1986	11.8	--	574	--	239	--	1,216	--
1992	13.9	+18%	725	+26%	344	+ 44%	1,375	+13%
2000	17.1	+45%	1,127	+96%	656	+174%	1,584	+30%

The projected roadway traffic volumes from the 1986, 1992, and 2010 simulations are discussed in detail in Technical Memorandum 2: FUTURE CONDITIONS. The 1986 simulation confirmed that many roadways in the MIA area experience congestion under existing conditions.

The 1992 simulation is shown in Figure IV-1 and illustrates the need for near term improvements in the MIA area. Figure IV-1 shows that operations on many roadways, such as LeJeune Road and NW 36 Street will be improved as a result of highway improvement projects in the TIP but will continue to experience over-capacity operations. The 2010 simulation showed that, even with the construction of all improvements in the long range transportation plan, roadways in the MIA area will continue to be over capacity The 2010 simulation is contained in Chapter V.

Transit Travel Forecasts

The transit travel forecasts result in comparisons of the relative attractiveness of the transit mode under the service and traffic conditions of 1986, 1992 and 2010. Table IV-3 summarizes the simulated boardings and alightings for the transit mode during the morning peak period (7:00 to 9:00 AM). This table shows relatively small increases in transit travel. These are all bus volumes since there is no Metrorail service in the MIA area. The individual bus route loadings are presented in Technical Memorandum 2: FUTURE CONDITIONS. Substantial increase in ridership along LeJeune Road and Flagler Avenue are expected and can be attributed to highway improvements on these roadways which, in turn, improves transit operating speeds.

Table IV-3

MIA Area Transit Travel Forecast Summary Morning Peak Period

Year	Boarding	Alighting	Total	% Increase Over 1986
1986	260	4,070	4,330	--
1992	360	4,735	5,095	+18%
2010	550	4,195	4,745	+10%

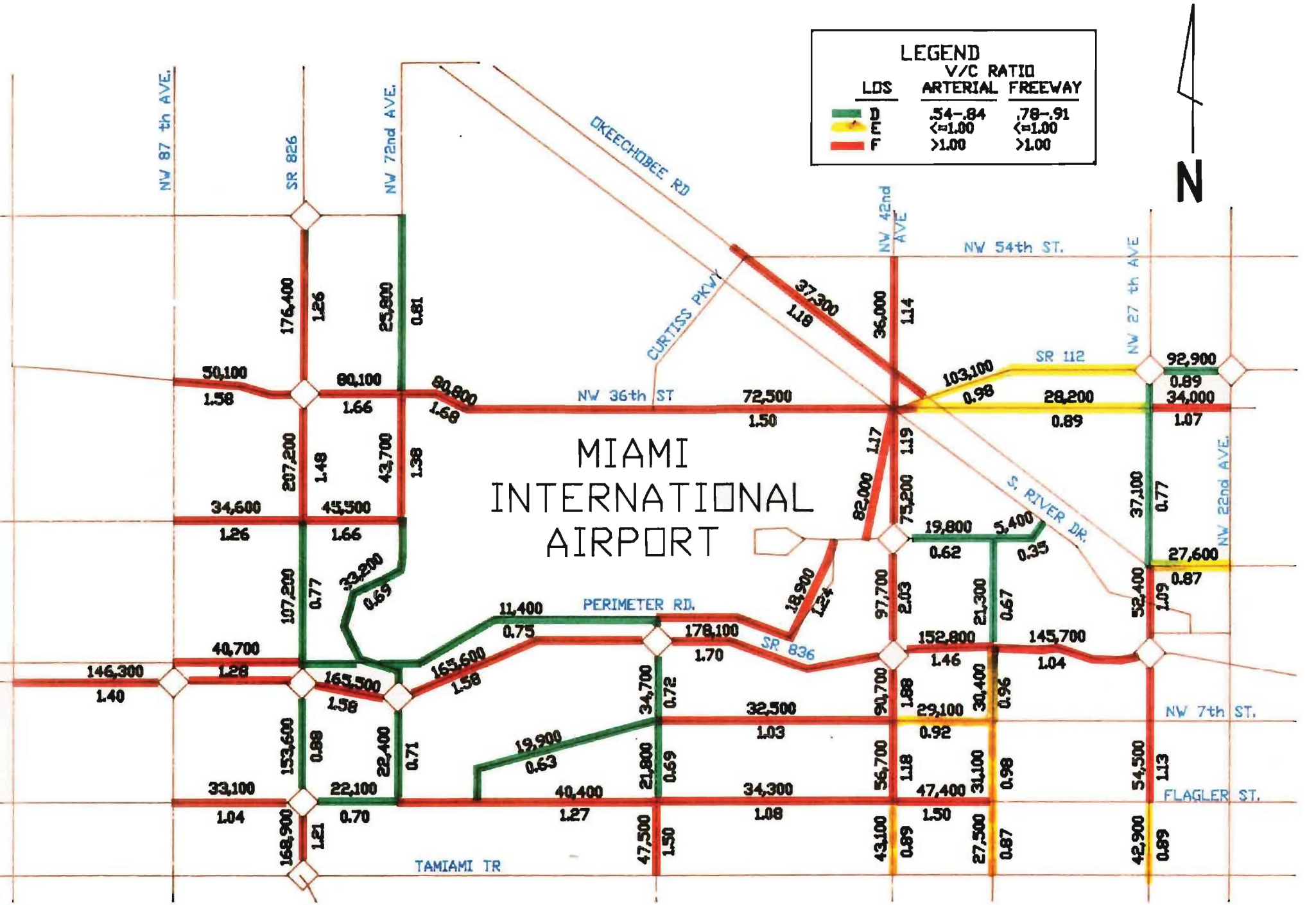


FIGURE IV-1 YEAR 1992 HIGHWAY VOLUMES

PRELIMINARY NEEDS ANALYSIS

Based upon analysis of the travel forecasts, a preliminary assessment was made of the need for transportation improvements beyond those already planned. This assessment was made by estimating the number of lane-miles of roads needed to maintain either Level of Service D or E as defined by the 1985 Highway Capacity Manual. This analysis shows that approximately 60 additional lane-miles of expressways and surface arterial roadways will be required beyond those already programmed in order to maintain Level of Service E. These improvements will cost more than 300 million dollars. Approximately 90 additional lane miles will be required to maintain Level of Service D. These improvements will cost about 330 million dollars.

V. FORMULATION AND ASSESSMENT OF ALTERNATIVES

Based upon the review of existing conditions and projections of future conditions, it is evident that significant investments in transportation improvements, beyond those already contained in regional programs and plans, will be needed to serve ground travel demands in the Miami International Airport (MIA) area.

FORMULATION OF ALTERNATIVES

Five concepts were formulated which contained alternative methods for improving the capacity of the transportation system. Each of these alternatives was developed by adding capacity to the approved transportation system. This latter system is referred to as the Year 2010 Base Network and is shown in Figure V-1.

Alternative A considered adding east-west expressway capacity to the Base Network as shown in Figure V-2. Alternative B considered adding north-south expressway capacity to the Base Network as shown in Figure V-3. Alternative C considered an expansion of the rapid transit system as shown in Figure V-4.

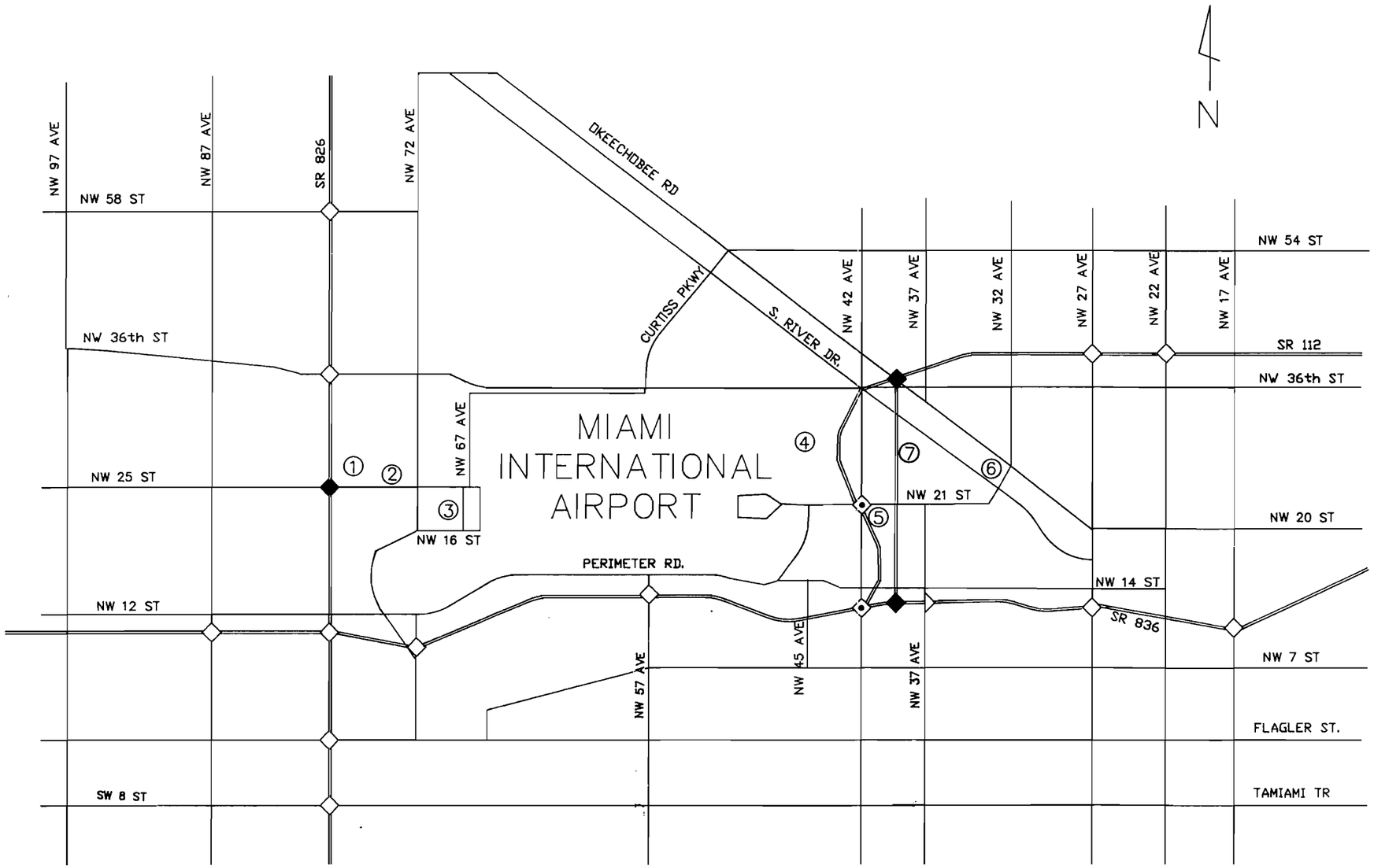
Alternative D sought to improve roadway operations by adding traffic engineering improvements plus roadway and interchange improvements to the Base Network as shown in Figure V-5, but did not add new corridors or facilities.

Alternative E considered a variety of highway and transit improvements. These were developed by incorporating the most effective elements of Alternatives A, B, C and D. The highway portion of Alternative E is shown in Figure V-6. The Metrorail portion of Alternative E is shown in Figure V-7.

These alternatives are discussed in greater detail in Technical Memorandum 3: FORMULATION AND ASSESSMENT OF ALTERNATIVES.

Long Range Traffic Projections

Year 2010 highway traffic assignments were prepared for the Base Network plus each of the five Alternatives A through E. These are shown in Figures V-8 through V-13, respectively, which depict projected 24 hour traffic volumes.



① NW 25 ST/SR 826 INTERCHANGE

② NW 25 ST

③ NW 16 ST/NW 67 AVE

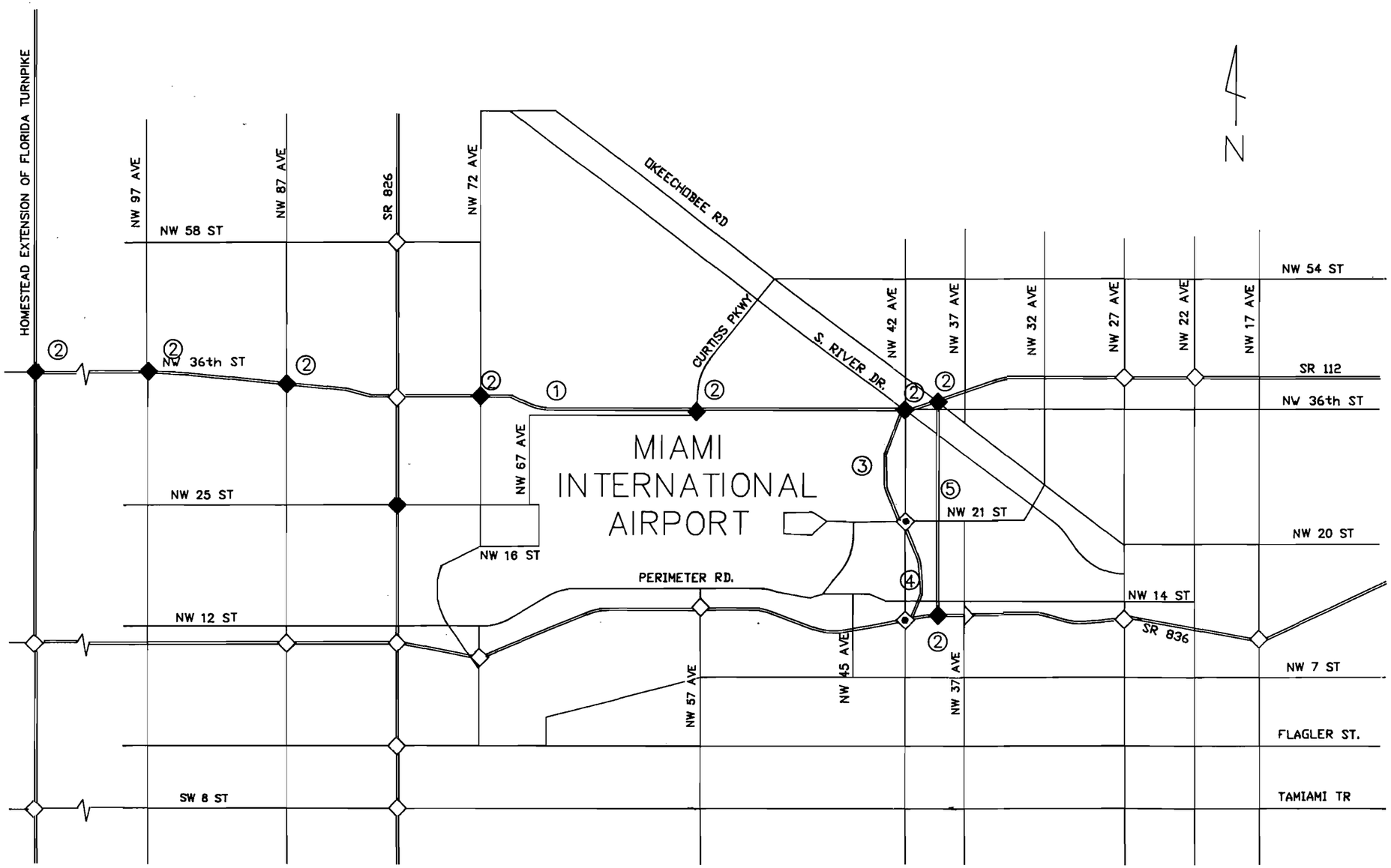
④ SR 112/MIA CONNECTOR

⑤ SR 836/MIA CONNECTOR

⑥ NW 21 ST/NW 32 AVE BRIDGE

⑦ SR 836/SR112 CONNECTOR

FIGURE V-1
YEAR 2010 BASE NETWORK



① SR 112 EXPRESSWAY EXTENSION

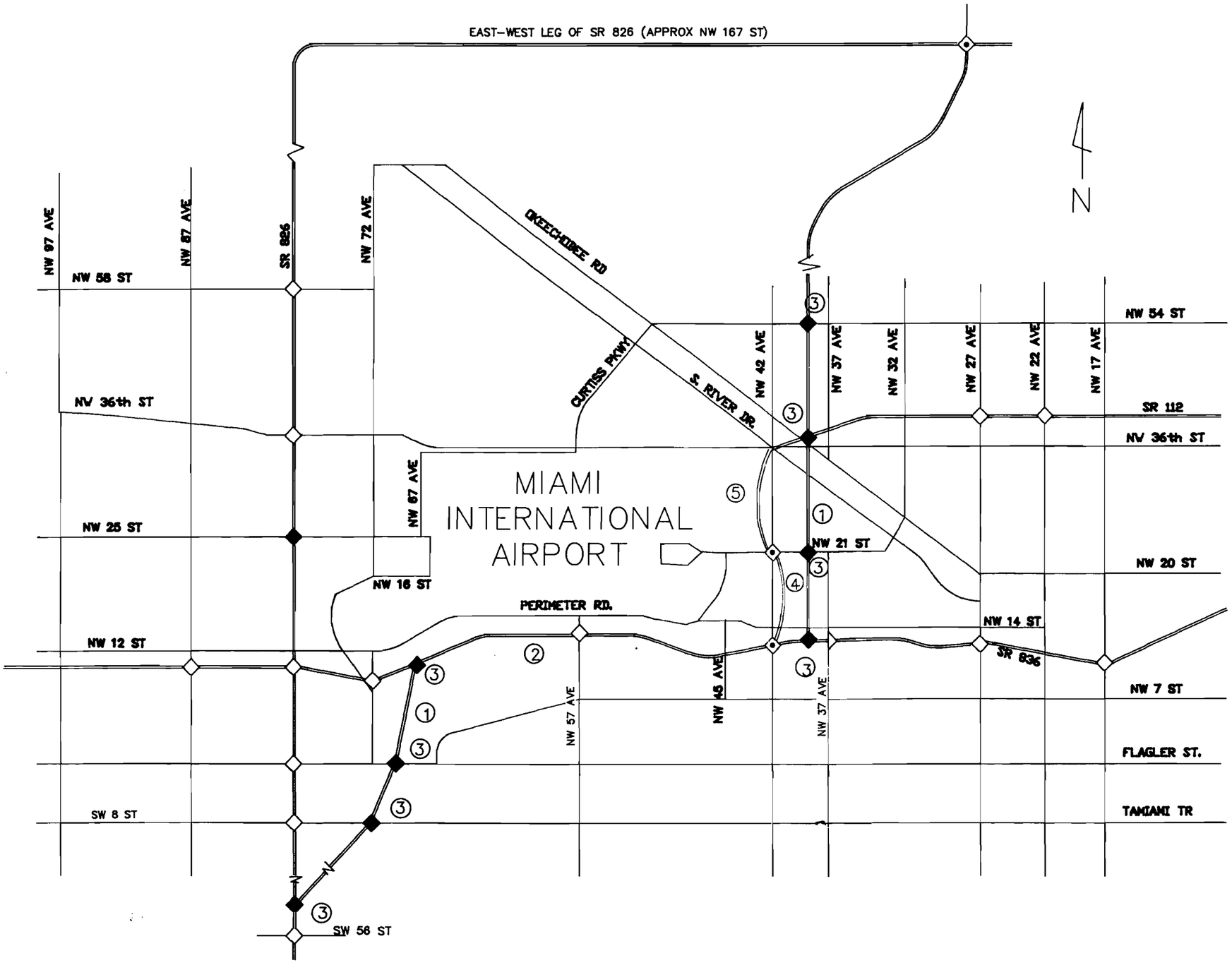
② NEW INTERCHANGE

③ SR 112/MIA CONNECTOR

④ SR 836/MIA CONNECTOR

⑤ SR 836/SR112 CONNECTOR

FIGURE V-2
YEAR 2010 ALTERNATIVE A

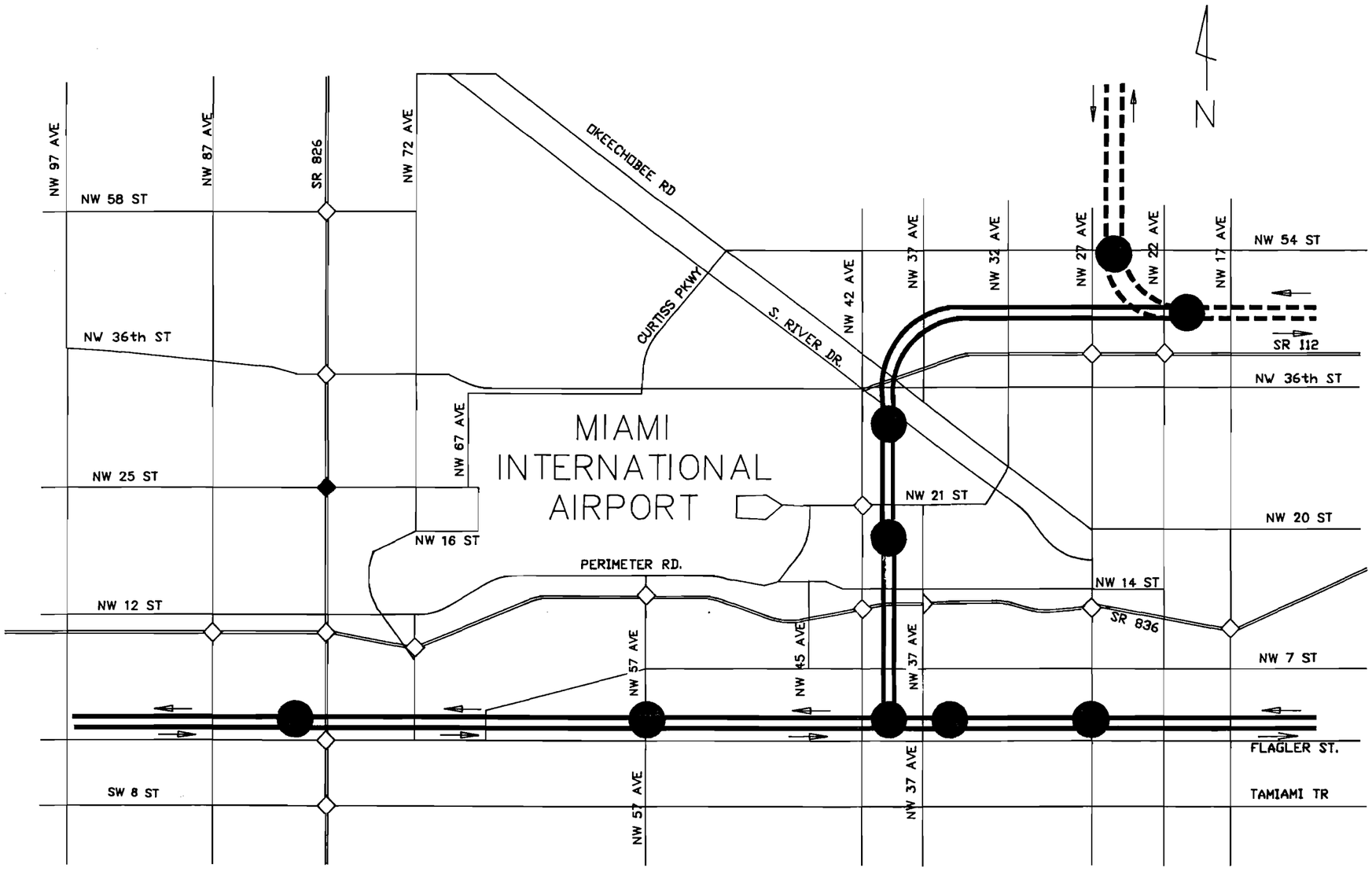


LEGEND

- FREEWAY
- SURFACE STREET
- EXISTING INTERCHANGE
- PROPOSED INTERCHANGE
- EXISTING PARTIAL INTERCHANGE
- PROPOSED PARTIAL INTERCHANGE
- PROPOSED MODIFIED INTERCHANGE

① EXPRESSWAY IN CSX CORRIDOR
② EXPRESSWAY OVERLAPS SR 836
③ NEW INTERCHANGE
④ SR 836/MIA CONNECTOR
⑤ SR 112/MIA CONNECTOR

FIGURE V–3
YEAR 2010 ALTERNATIVE B

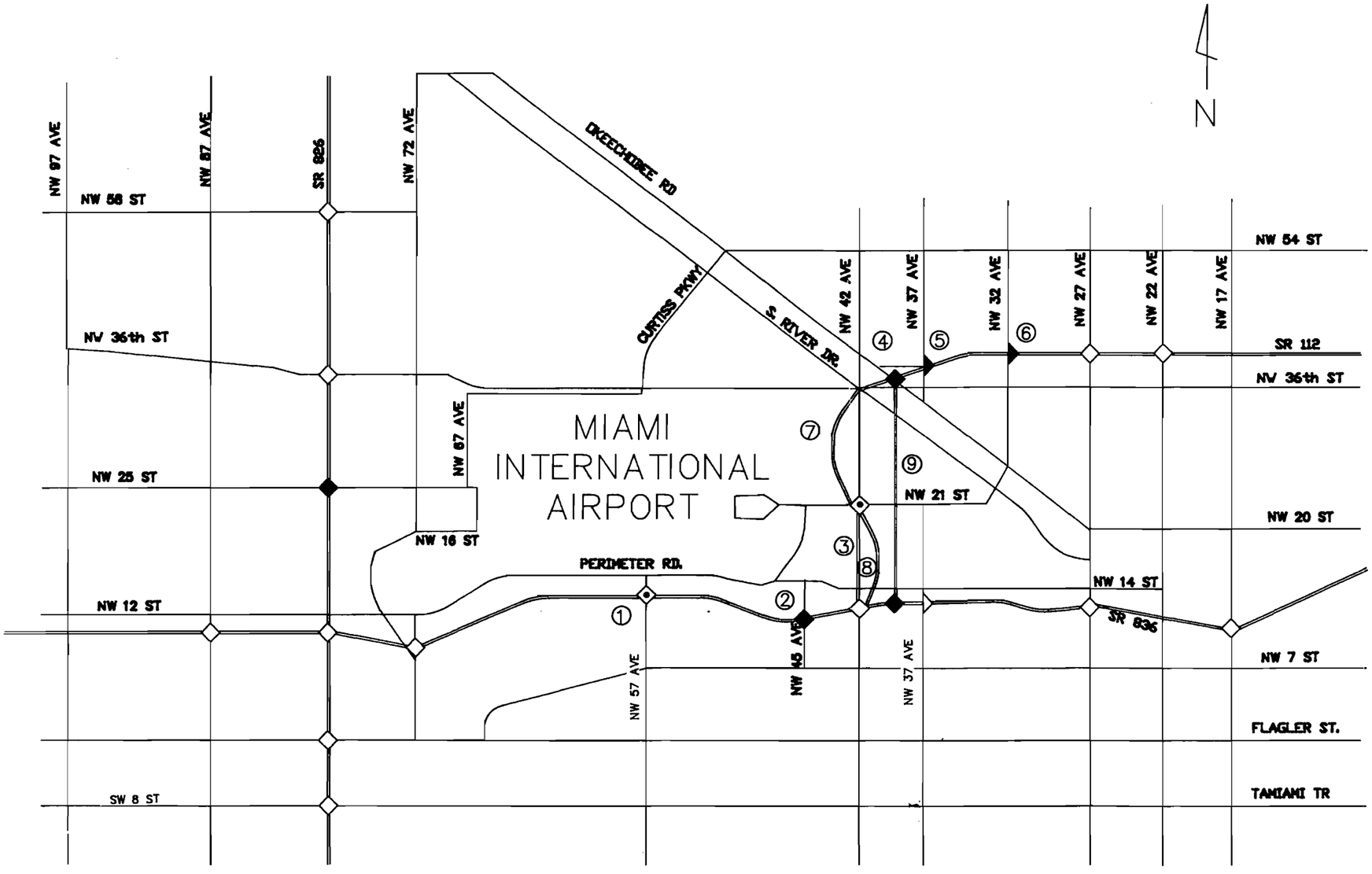


LEGEND

- FREEWAY
- SURFACE STREET
- EXISTING INTERCHANGE
- PROPOSED INTERCHANGE
- EXISTING PARTIAL INTERCHANGE
- PROPOSED PARTIAL INTERCHANGE
- PROPOSED MODIFIED INTERCHANGE
- EXISTING METRORAIL
- METRORAIL EXPANSION
- METRORAIL STATION

NOTE:
THE HIGHWAY PORTION OF ALTERNATIVE C IS THE SAME AS THE YEAR 2010 BASE NETWORK

FIGURE V-4
YEAR 2010 ALTERNATIVE C
METRORAIL EXPANSION



LEGEND

- FREEWAY
- SURFACE STREET
- EXISTING INTERCHANGE
- PROPOSED INTERCHANGE
- EXISTING PARTIAL INTERCHANGE
- PROPOSED PARTIAL INTERCHANGE
- PROPOSED MODIFIED INTERCHANGE

① SR 836/NW 57 AVE INTERCHANGE MODIFICATION
② SR 836/NW 45 AVE INTERCHANGE
③ LEJEUNE RD (NW/SW 42 AVE)
④ SE14 ST (CITY OF HIALEAH)
⑤ NW 37 AVE INTERCHANGE
⑥ NW 32 AVE INTERCHANGE
⑦ SR 112/MIA CONNECTOR
⑧ SR 836/MIA CONNECTOR
⑨ SR 836/SR 112 CONNECTOR

FIGURE V-5

YEAR 2010 ALTERNATIVE D

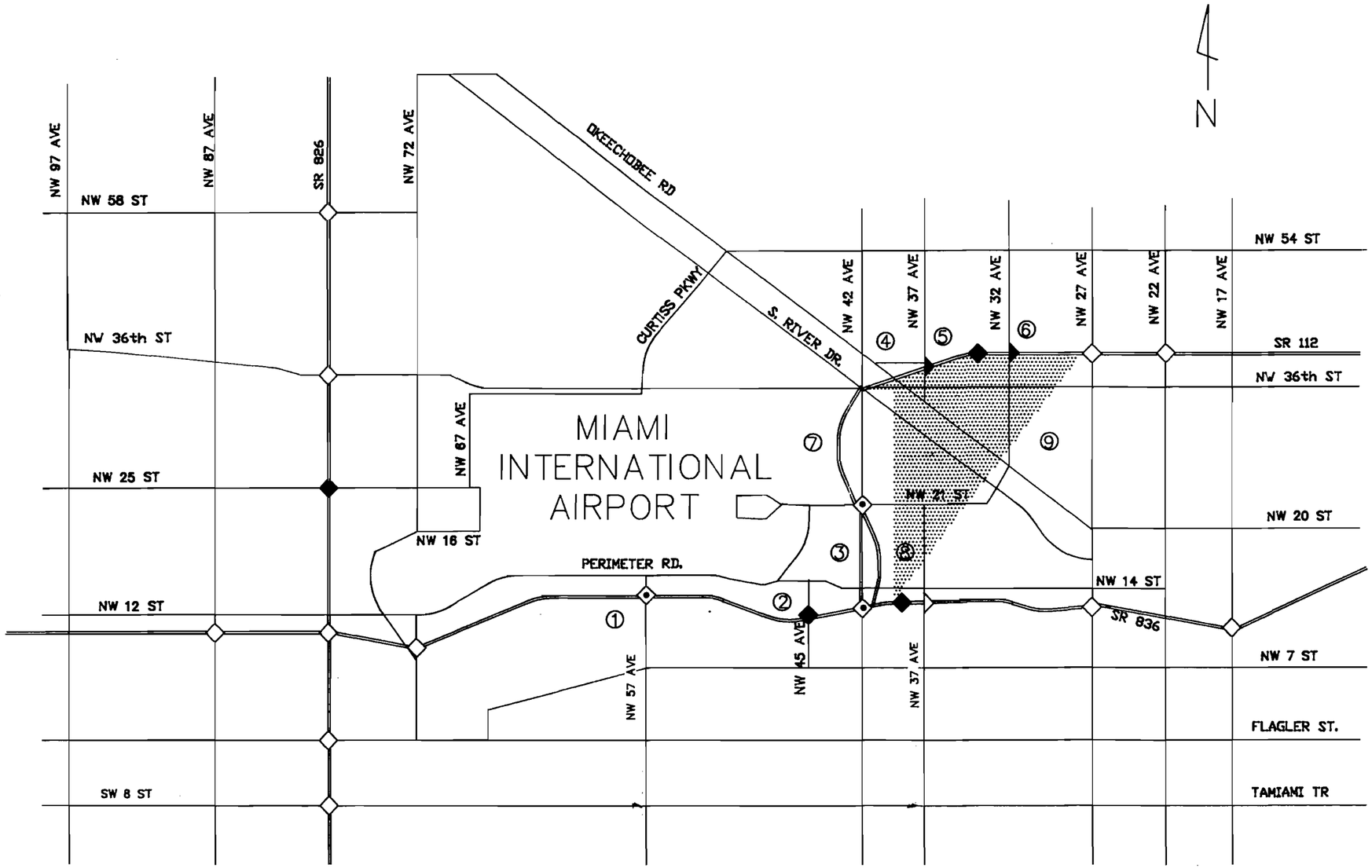


FIGURE V-6
YEAR 2010 ALTERNATIVE E
(HIGHWAY)

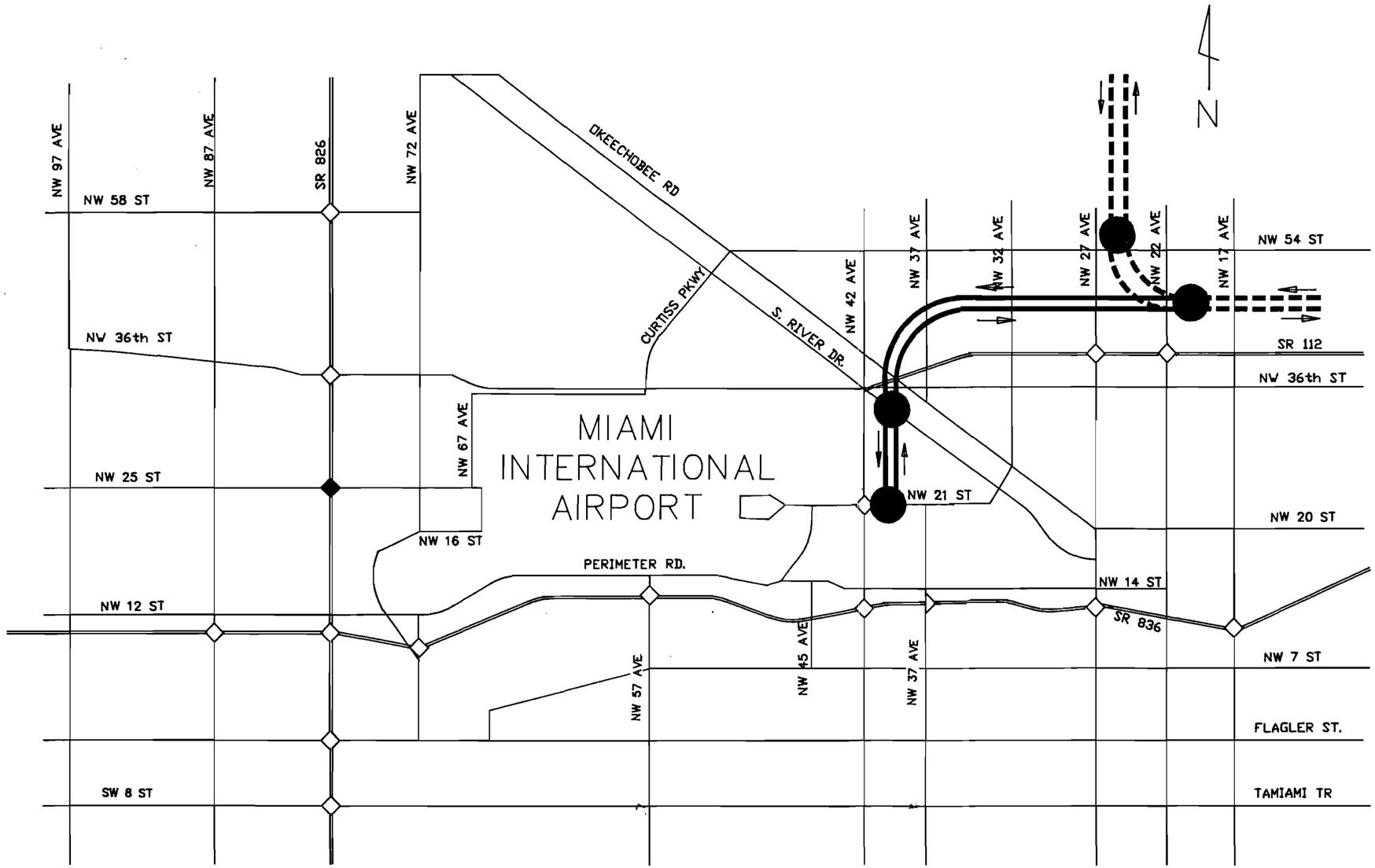


FIGURE V–7
YEAR 2010 ALTERNATIVE E
(METRORAIL EXTENSION)

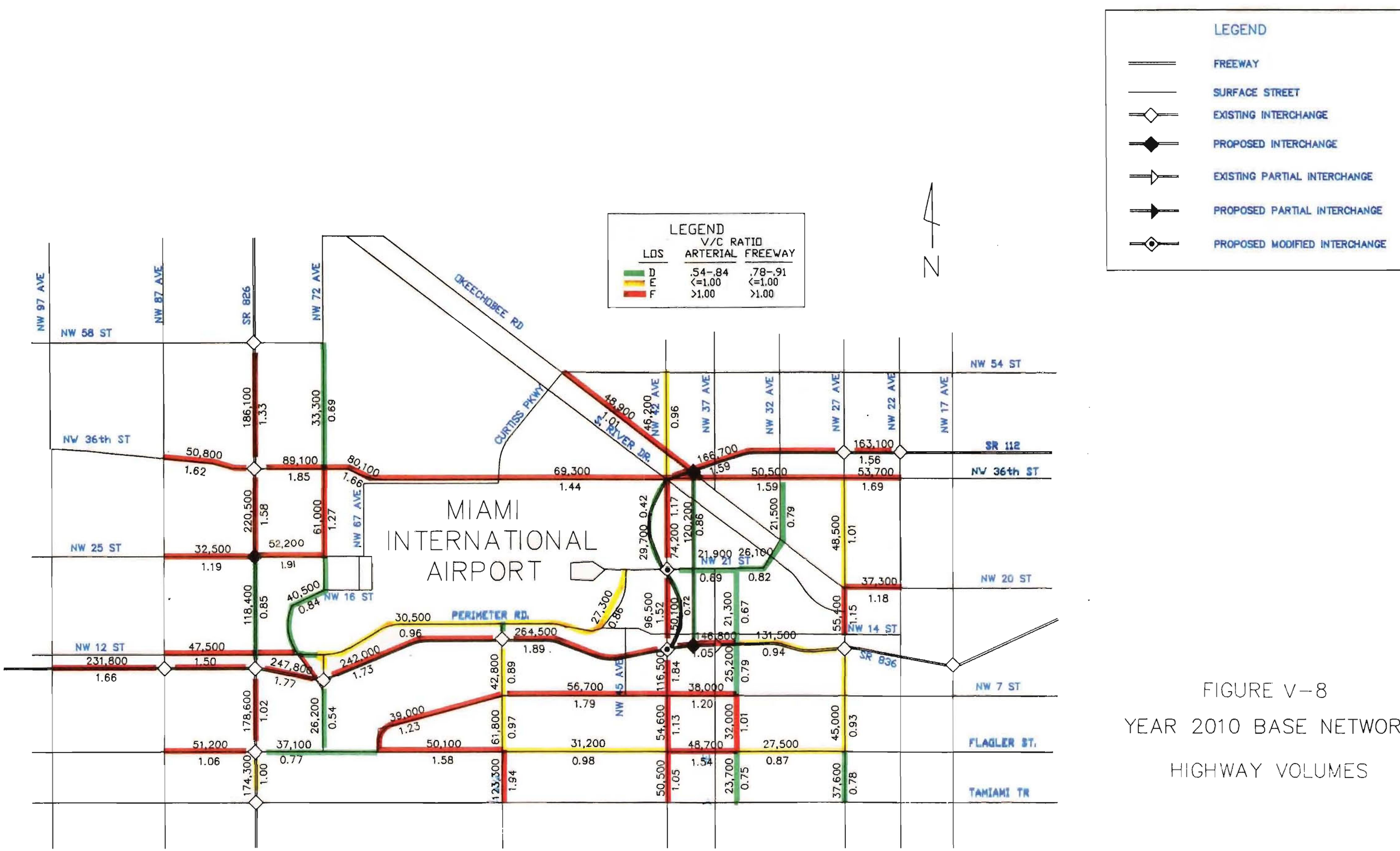


FIGURE V-8

YEAR 2010 BASE NETWORK

HIGHWAY VOLUMES

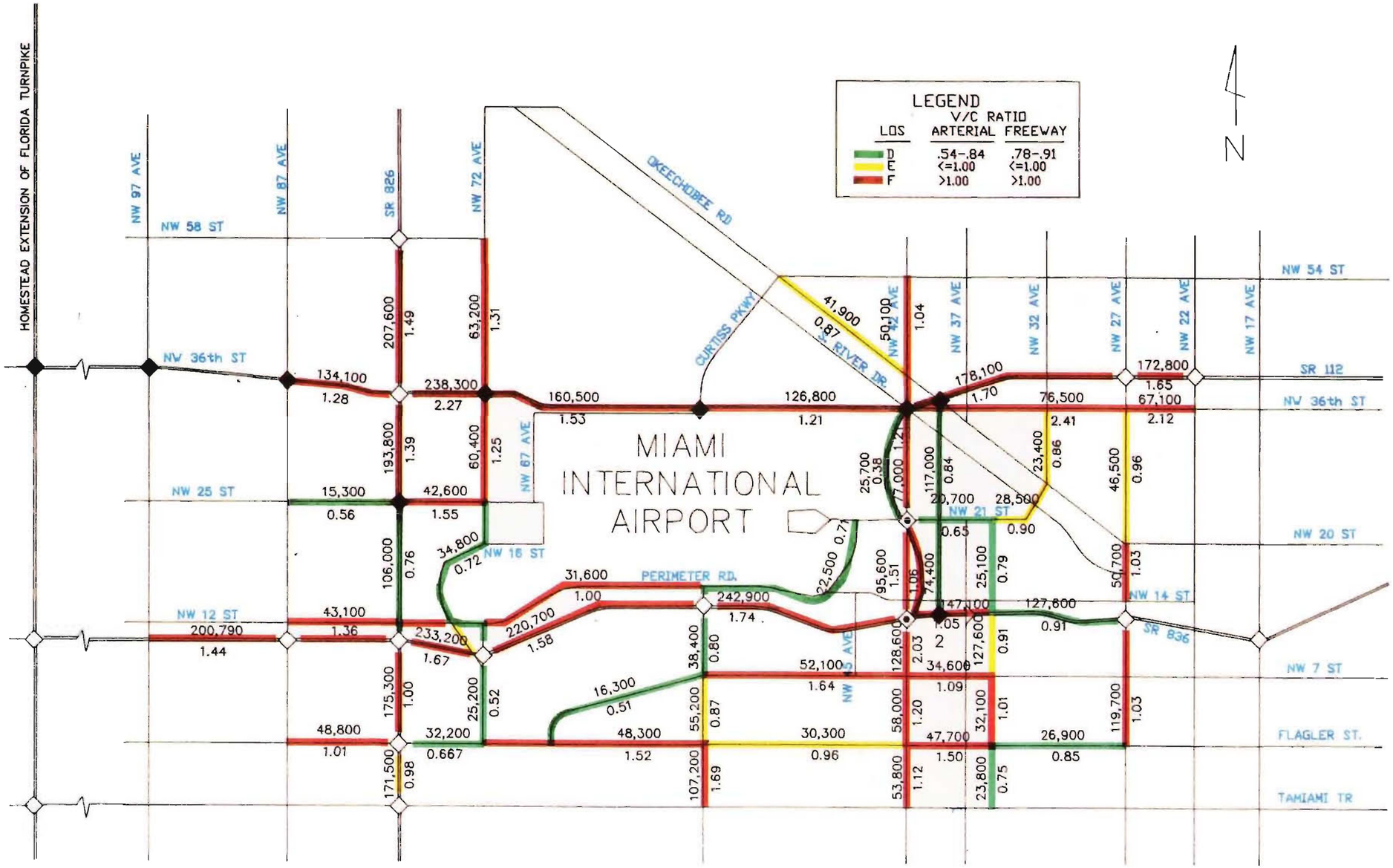
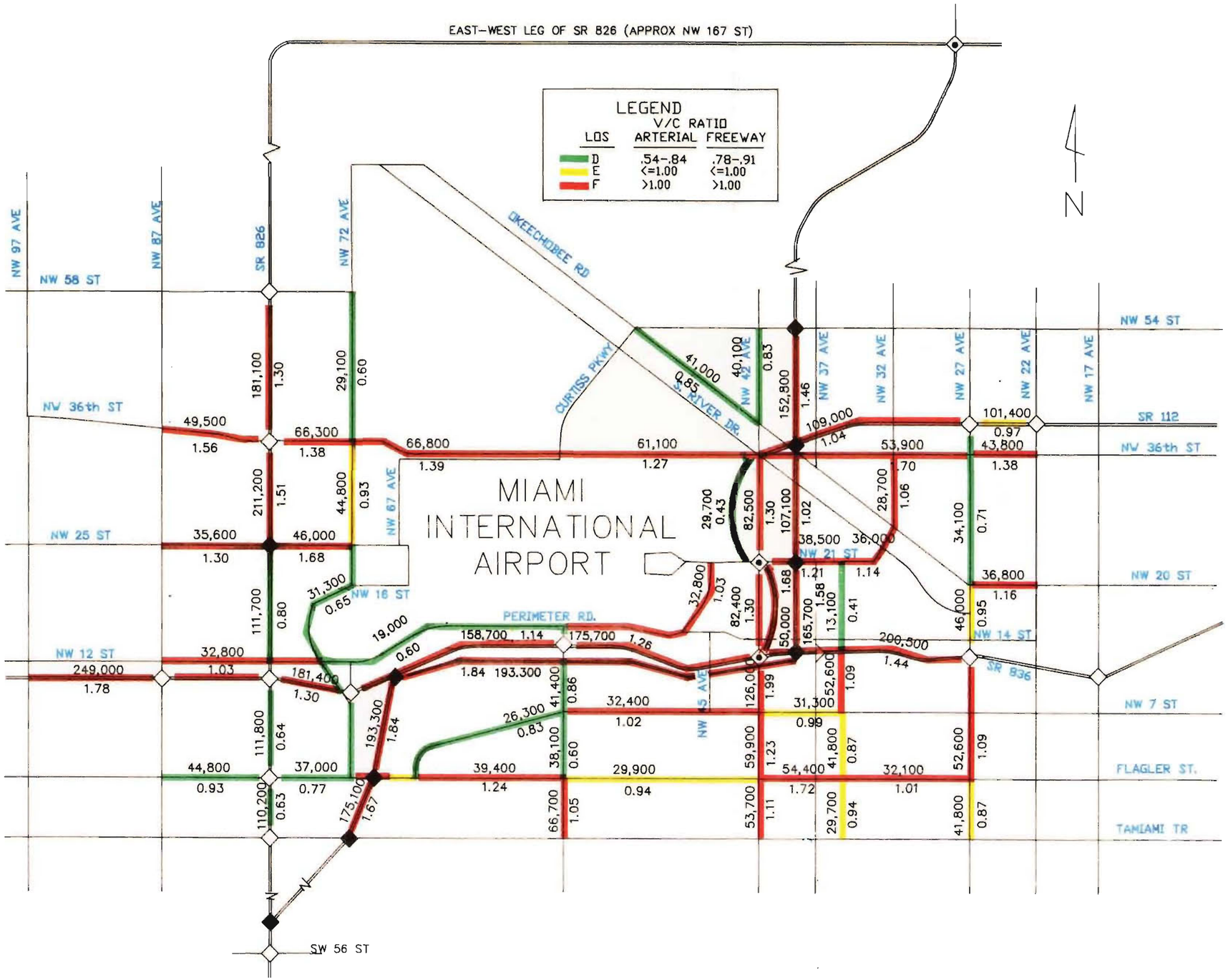


FIGURE V-9

YEAR 2010 ALTERNATIVE A

HIGHWAY VOLUMES



LEGEND

- FREEWAY
- SURFACE STREET
- EXISTING INTERCHANGE
- PROPOSED INTERCHANGE
- EXISTING PARTIAL INTERCHANGE
- PROPOSED PARTIAL INTERCHANGE
- PROPOSED MODIFIED INTERCHANGE

FIGURE V–10

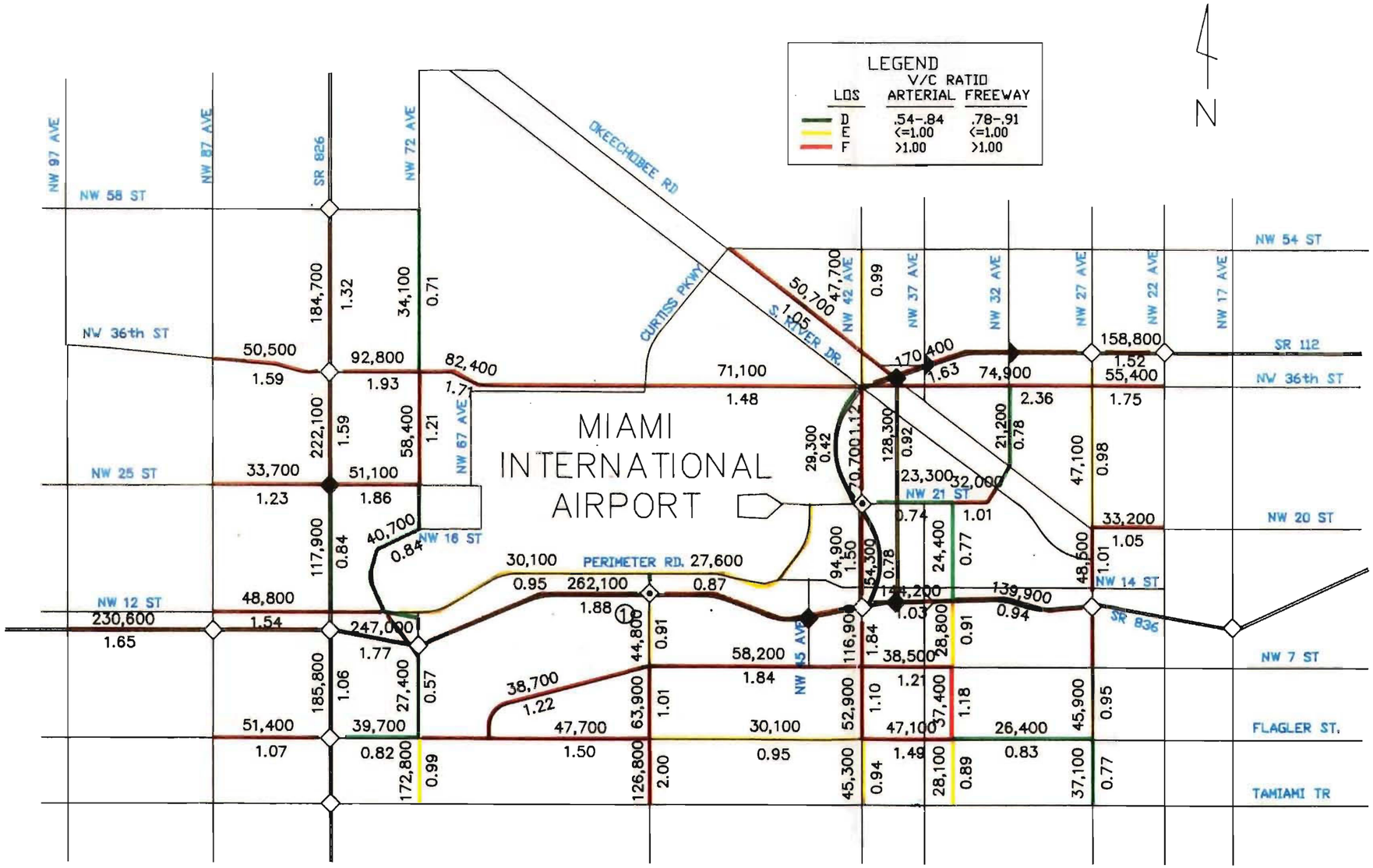
YEAR 2010 ALTERNATIVE B

HIGHWAY VOLUMES

FIGURE V-11

YEAR 2010 ALTERNATIVE C

HIGHWAY VOLUMES



LEGEND

- FREEWAY
- SURFACE STREET
- EXISTING INTERCHANGE
- PROPOSED INTERCHANGE
- EXISTING PARTIAL INTERCHANGE
- PROPOSED PARTIAL INTERCHANGE
- PROPOSED MODIFIED INTERCHANGE

FIGURE V–12

YEAR 2010 ALTERNATIVE D

HIGHWAY VOLUMES

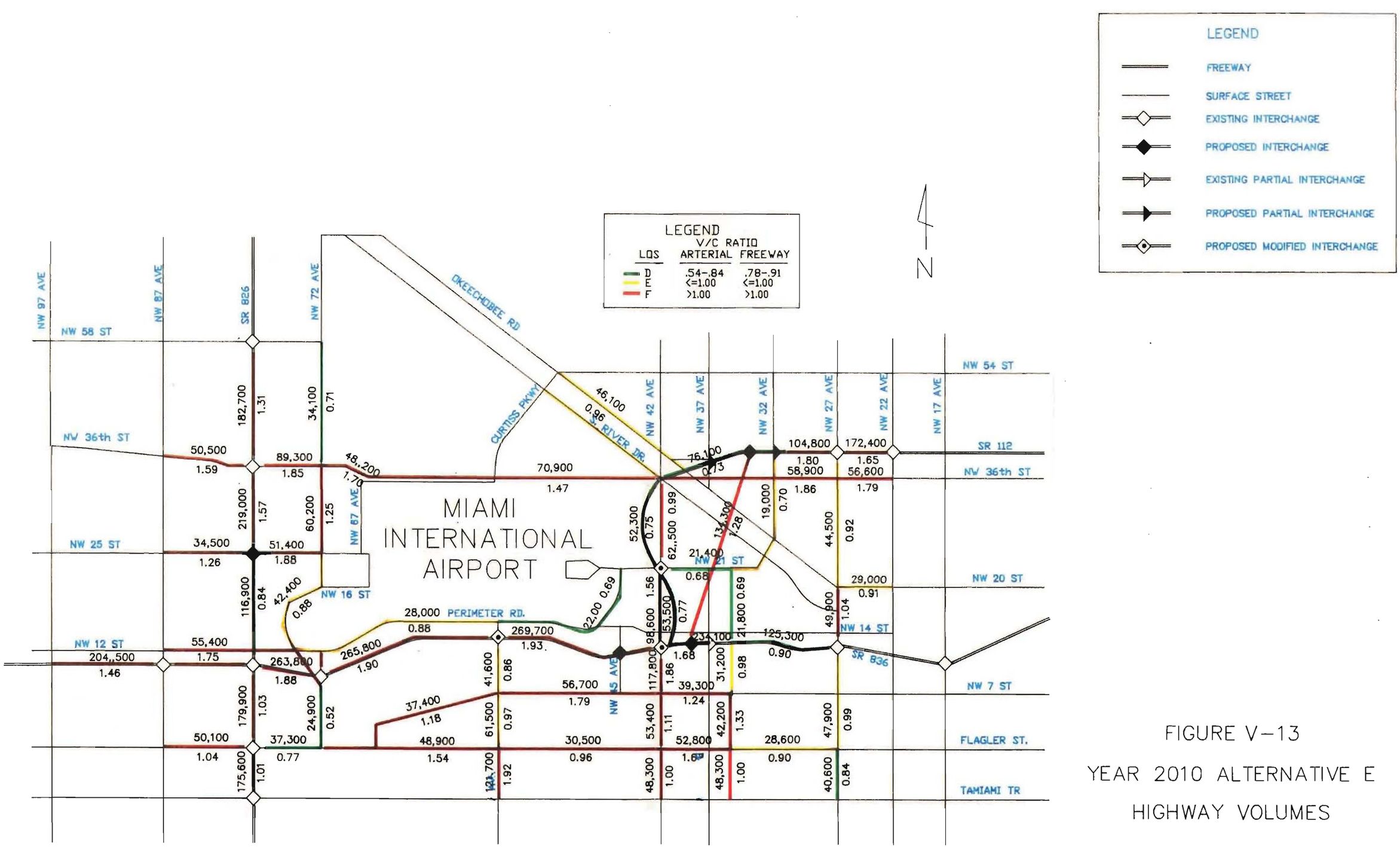


FIGURE V-13

YEAR 2010 ALTERNATIVE E

HIGHWAY VOLUMES

Year 2010 rapid transit traffic assignments were prepared for Alternatives C and E. These are the two alternatives which included extensions of the rapid transit system in the MIA study area. These are shown in Figure V-14 and V-15, respectively, which depict projected morning peak period rapid transit ridership.

Surface transit projections for the year 2010 were also prepared for the Base Network and for Alternatives C and E. These are shown in Figures V-16, V-17 and V-18, respectively, which depict projected morning peak hour surface bus ridership. It should be noted that no surface transit improvements were included in any of the year 2010 analyses. Therefore, these figures show projected long range surface bus ridership on the existing (1986) service system.

These projections were used for the subarea assessment of alternatives.

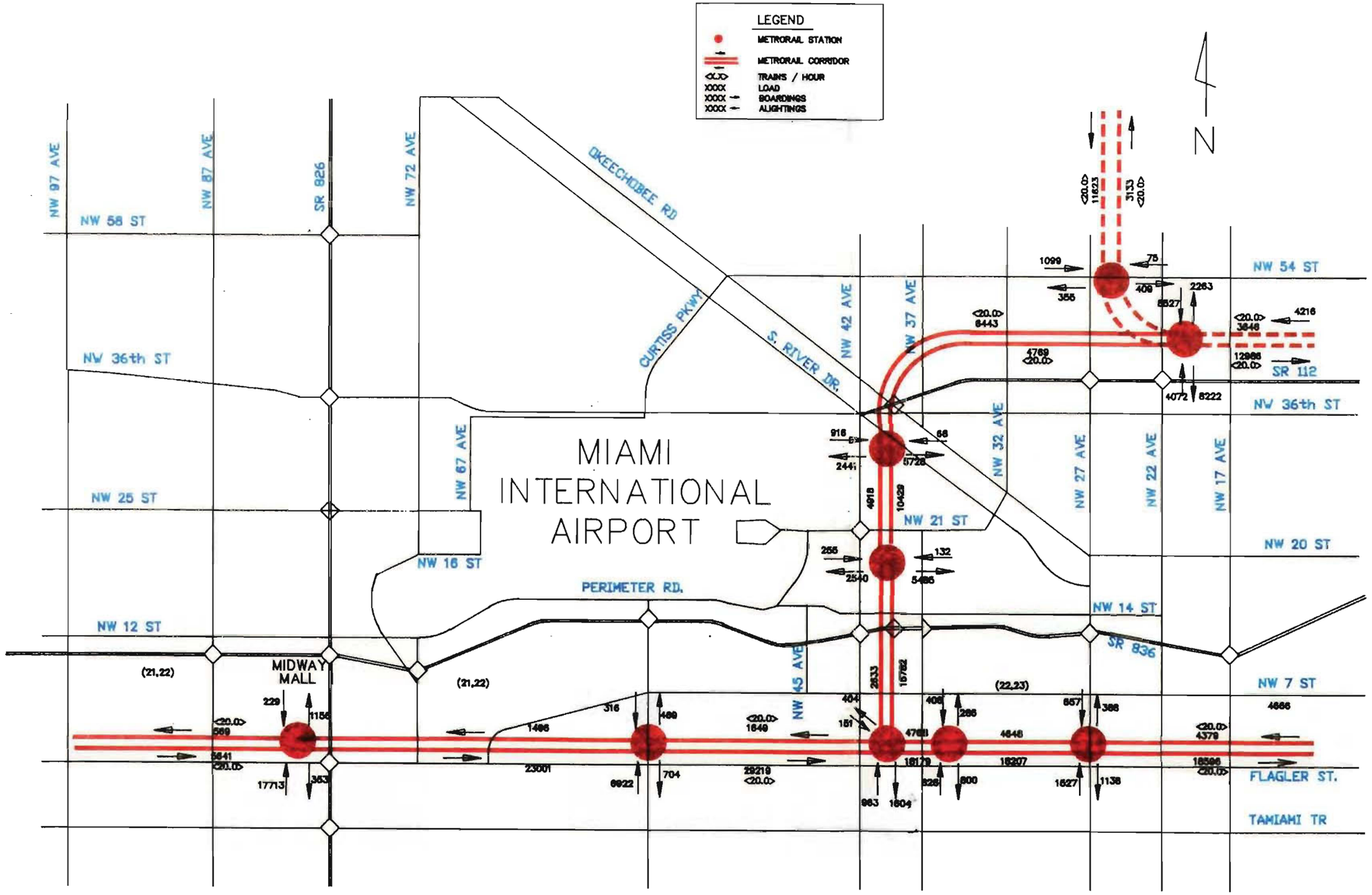
SUBAREA ASSESSMENT OF ALTERNATIVES

Alternative transportation improvements were considered both to improve access to Miami International Airport and also to provide facilities which non-MIA traffic can use without interfering with Airport traffic. Assessment of the alternatives was carried out on both a subarea and microscale basis to find a system alternative which would best provide additional system capacity by implementing capital improvements to the highway and transit systems to reduce delays, eliminate capacity restrictions and provide alternative travel paths.

The subarea-level assessment was carried out during the development of the successive system alternatives. The traffic measurements which were incorporated in the subarea assessment enabled the Steering Committee to analyze the performance of both the Base Network and the Alternatives. These analyses also provided valuable guidance in formulating and refining subsequent alternatives.

Key factors considered in the evaluation of alternatives included:

- Selected systemwide measures of effectiveness including:
  - Total vehicle-miles and vehicle-hours of travel
  - Travel speed
  - System volume/capacity ratio



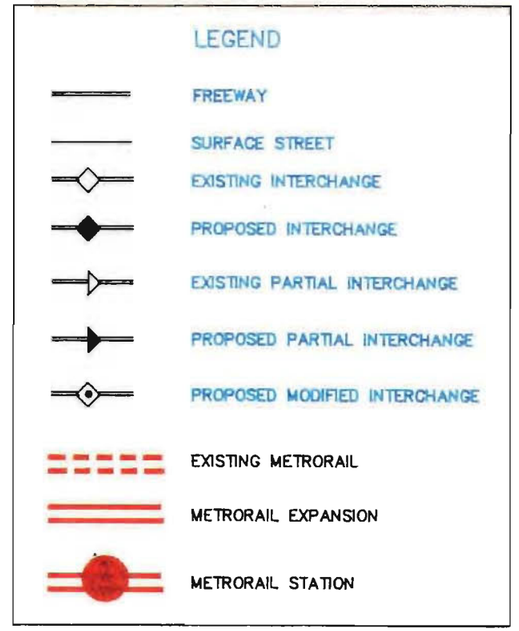
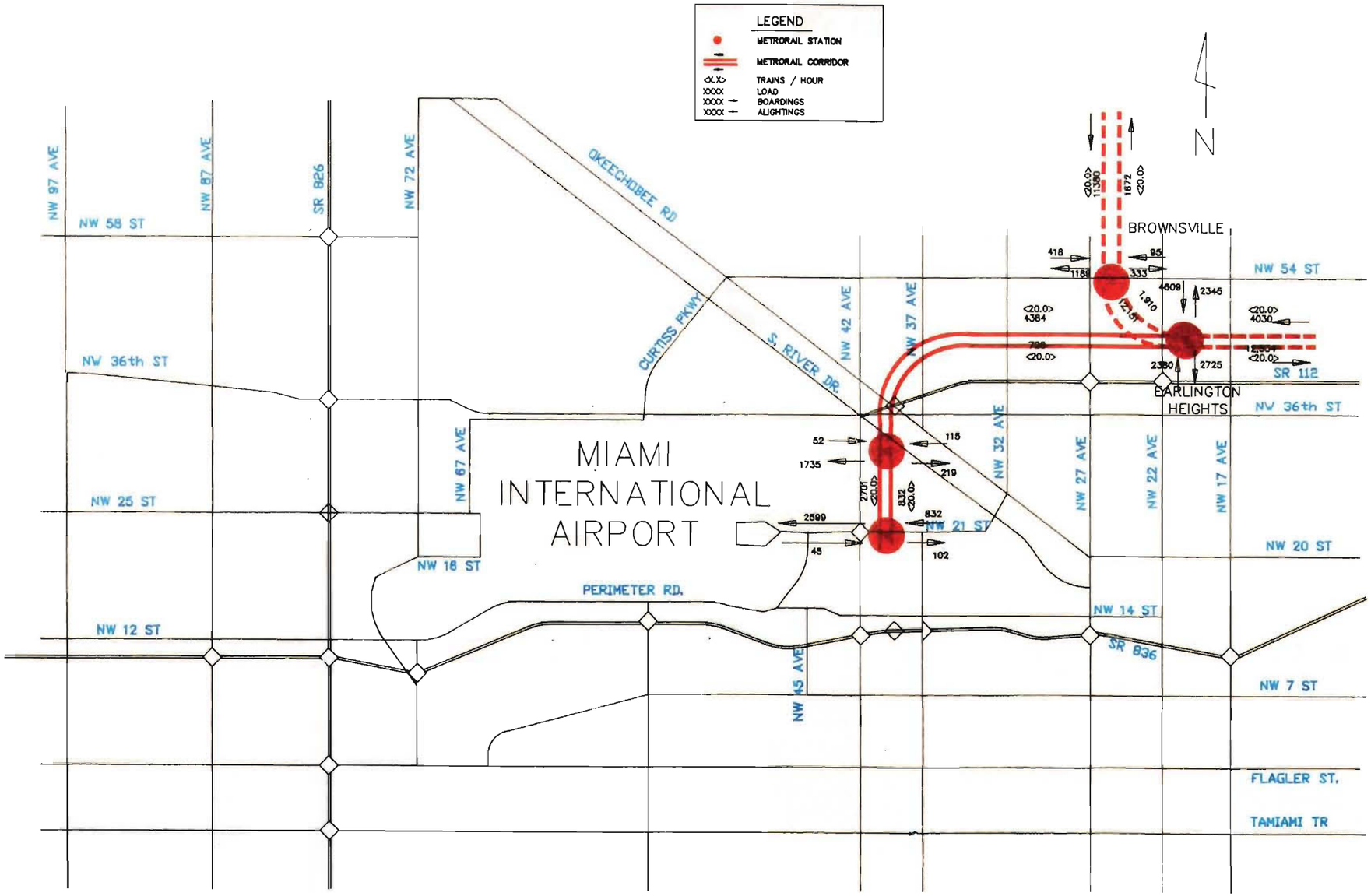


FIGURE V–14

YEAR 2010 ALTERNATIVE C

METRORAIL RIDERSHIP



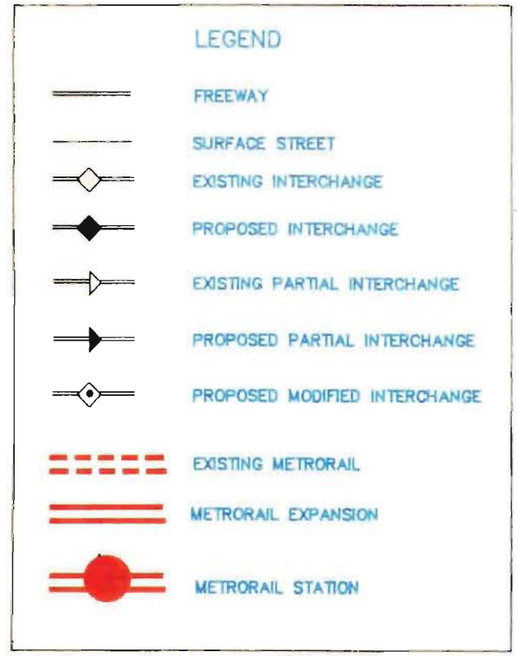


FIGURE V-15

YEAR 2010 ALTERNATIVE E

METRORAIL RIDERSHIP

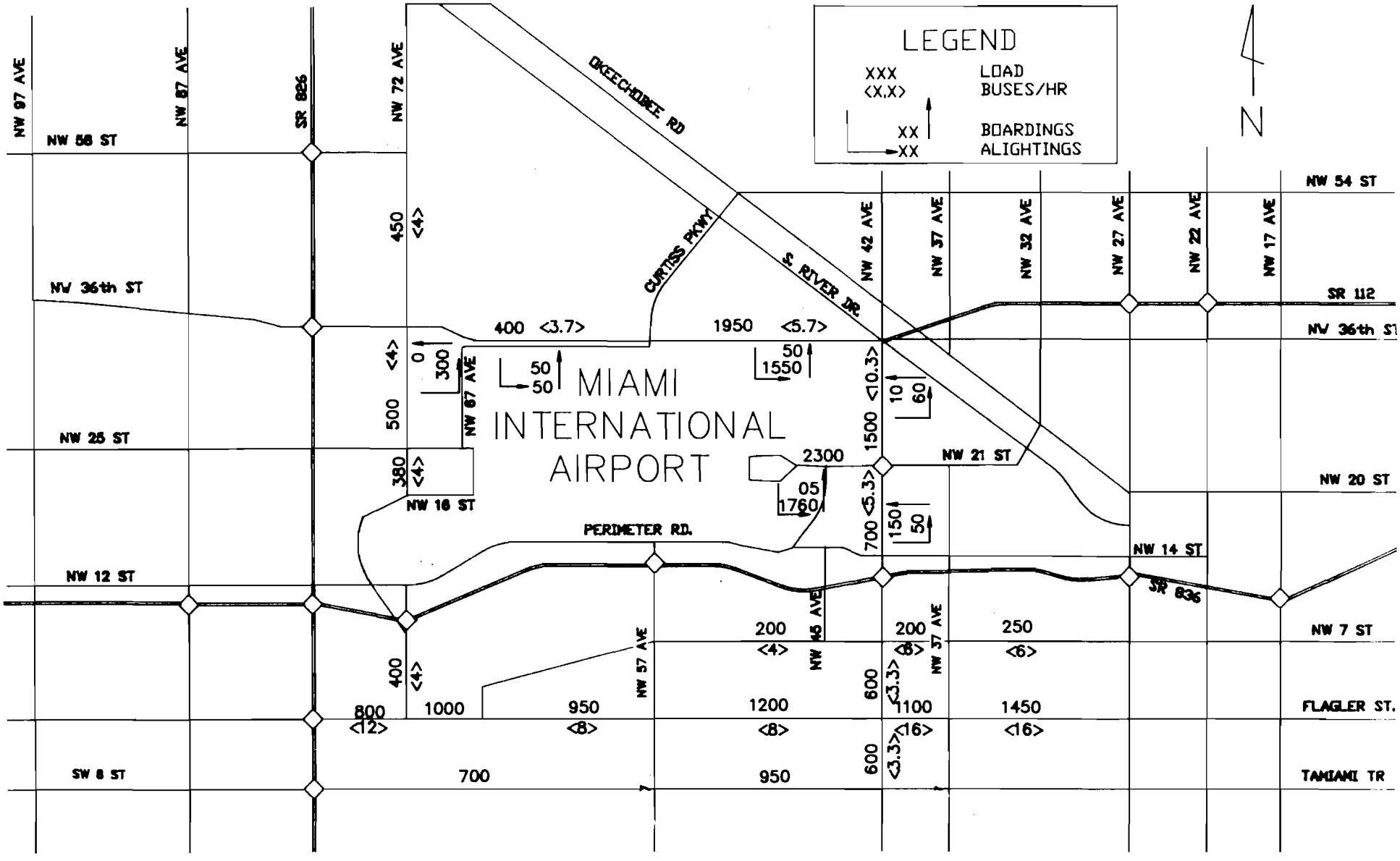


FIGURE V-16 YEAR 2010
SURFACE TRANSIT (AM PEAK HOUR)

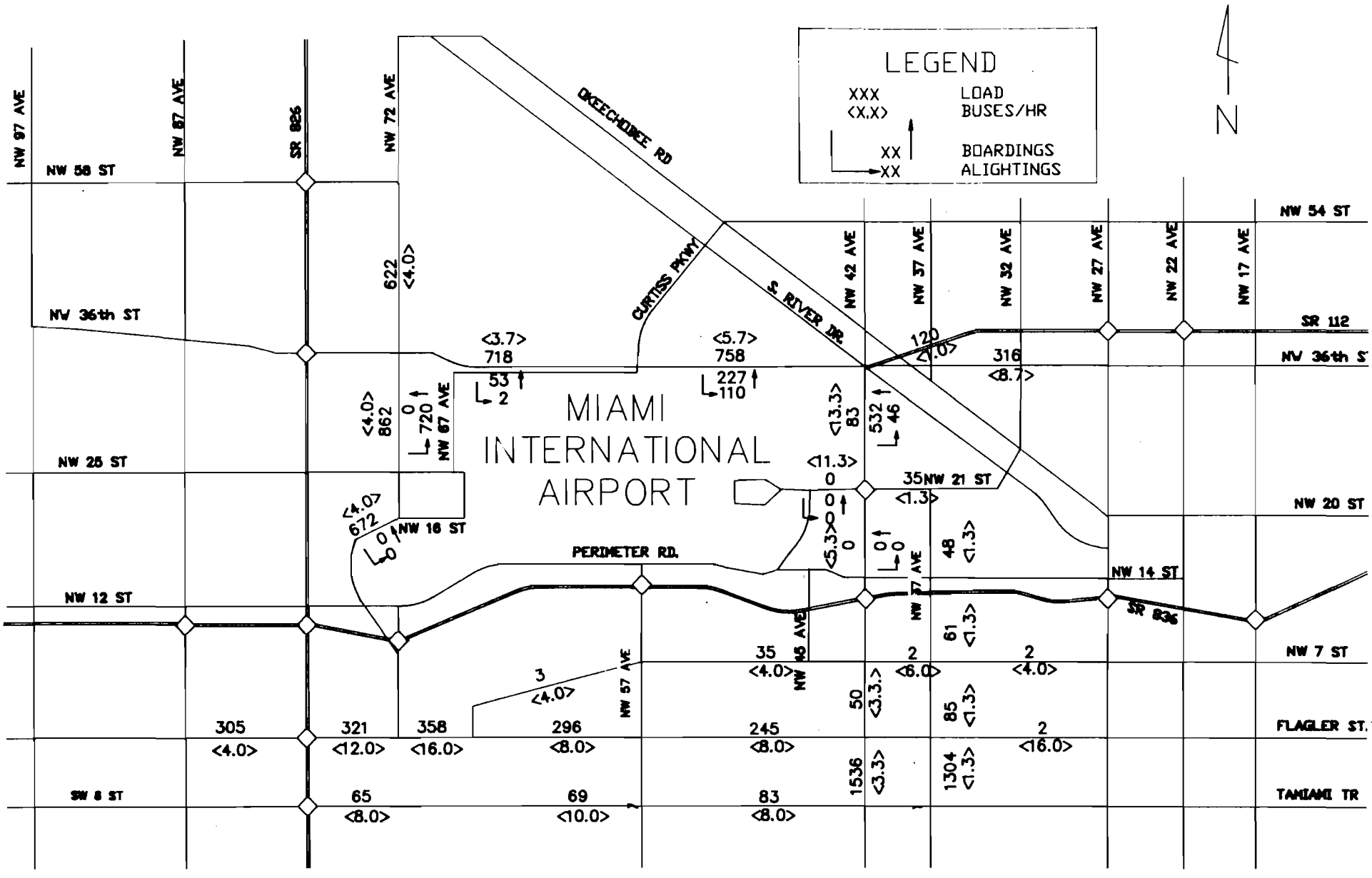


FIGURE V-17 YEAR 2010 ALTERNATIVE C
SURFACE TRANSIT (AM PEAK HOUR)

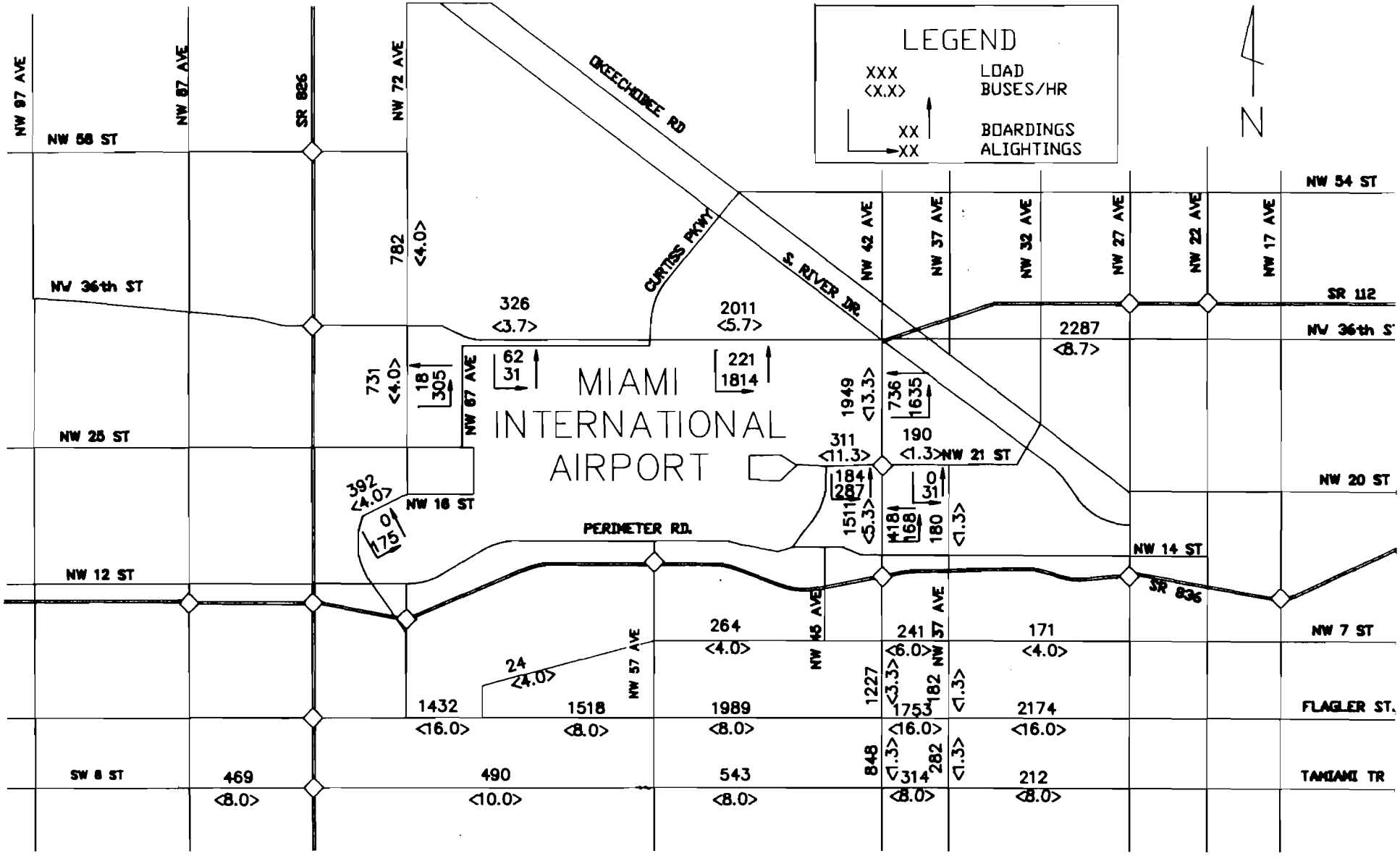


FIGURE V–18 YEAR 2010 ALTERNATIVE E
SURFACE TRANSIT (AM PEAK HOUR)

  - Travel hazard
  - Pollutant emissions
  - Fuel Consumption
  - Delay due to congestion
- o Order of Magnitude costs
- o Roadway and transit network impacts
- o Environmental, land use and social impacts
- o Improved access to MIA

These evaluation factors are summarized in Table V-1. This subarea evaluation matrix was considered by the Steering Committee in formulating the recommendations contained in Chapter VI of this report. The subarea assessment of alternatives is described in detail in Technical Memorandum 3: **FORMULATIONS AND ASSESSMENT OF ALTERNATIVES.**

The subarea assessment of alternatives led to the following general conclusions:

- o The recommended improvements include both new roadway and transit facilities and improvements to existing facilities. However, a substantial portion of the roadway and transit facilities which will serve the future travel demands of the MIA area is already in place and operating. The influence of the existing transportation system is evident in Table V-1 which shows that there are no dramatic differences in the performance measures among the several alternatives and the Base Network.
- o Traffic on roadways within the MIA study area will increasingly be composed of regional traffic that is seeking to bypass the Airport on its way to non-Airport destinations. This component will be in addition to traffic destined to the Airport and to Airport-related land uses.
- o Although MIA is the largest single traffic generator, study area traffic problems are not solely attributable to MIA. It is important that transportation solutions developed for the MIA study area be fully integrated into county-wide and regional transportation plans.
- o Introducing major new freeway corridors may draw regional traffic volumes from other roadways into the MIA area. Existing expressways and arterial streets which provide important access to MIA may also be required to serve

TABLE V-I SUMMARY EVALUATION MATRIX

Evaluation Factor	Year 2010 Base	IMPACT Year 2010 A	Year 2010 B	Year 2010 C	Year 2010 D	Year 2010 E
Minimize Vehicle-Miles of Travel (VMT)	VMT = 17,113,600	17,403,888 (+1.7%)	17,225,248 (+0.7%)	16,834,016 (-1.6%)	17,122,672 (+0.1%)	17,157,104 (+0.3%)
Minimize Vehicle-Hours of Travel (VHT)	VHT = 1,126,720	1,035,872 (-8.1%)	987,450 (-12.4%)	1,031,564 (-8.4%)	1,134,141 (+0.7%)	1,103,537 (-2.1%)
Minimize Travel Speed Difference	Diff = 16.50 MPH	15.17 mph (-8.1%)	14.42 mph (-12.6%)	15.37 mph (-6.8%)	16.58 mph (+0.5%)	16.18 mph (-1.9%)
Minimize System Volume/Capacity Ratio:						
1) Based on VMT	v/c (VMT) = 1.56	1.51 (-3.2%)	1.49 (-4.5%)	1.53 (-1.9%)	1.56 (-0.0%)	1.55 (-0.6%)
2) Based on VHT	v/c (VHT) = 1.93	1.82 (-5.7%)	1.78 (-7.8%)	1.83 (-5.2%)	1.93 (-0.0%)	1.90 (-1.6%)
Minimize Number of Accidents	#ACC = 203	197 (-3.0%)	196 (3.4%)	201 (-1.0%)	204 (+0.4%)	203 (-0.0%)
Minimize Pollution Emissions	Emiss. = 327.1 Ton	326.4 (-0.2%)	326.7 (-0.1%)	321.1 (-1.8%)	328.0 (+0.3%)	327.3 (+0.1%)
Minimize Fuel Consumption	Cons = 1,400,458 gal	1,408,925 (+0.6%)	1,396,136 (-0.3%)	1,379,514 (-1.5%)	1,403,129 (+0.2%)	1,403,894 (+0.2%)
Minimize Delay Due to Congestion	Delay = 656,393 Hour	564,996 (-13.7%)	520,473 (-20.7%)	568,019 (-13.5%)	662,264 (+0.9%)	631,086 (-3.9%)
Minimize Order of Magnitude Cost ($ Million)	96.9	771.7	521.2	945.2	106.4	275.6
Minimize Cutline v/c Ratio:						
1) North Cutline	1.02	1.07	1.03	1.00	1.04	1.02
2) South Cutline	1.13	1.12	1.27	1.11	1.13	1.16
3) East Cutline	1.42	1.51	1.58	1.39	1.44	1.43
4) West Cutline	1.75	1.56	1.44	1.70	1.77	1.76

Evaluation Factor	Year 2010 Base	Year 2010 A	Year 2010 B	Year 2010 C	Year 2010 D	Year 2010 E
Maximize Metrorail Passenger Trips in Morning Peak Period	Trips = 40,625	NA	NA	102,347 (+151.9%)	NA	47,791 (+17.6%)
Maximize Metrorail Passenger Miles in Morning Peak Period	Pass. Miles = 239,056	NA	NA	546,087 (+128.4%)	NA	264,073 (+10.5%)
Maximize Metrorail Passenger Hours in Morning Peak Period	Pass. Hours = 7,914	NA	NA	15,340 (+93.8%)	NA	8,645 (+9.2%)
Environmental, Land Use and Social Considerations		o R/W acquisition o Business damages o Residential impacts o Feasibility of grade separations o Community Barrier	o Use CSX R/W to reduce acquisition costs o Extensive revisions to SR 836 mainline and interchanges	o Air quality o Water quality o Noise and vibration o Station area land values o R/W acquisition o Use of air rights, joint development, etc. o Redevelopment impetus o Community barrier o Community intrusion o Feeder bus impacts	o Short-term capacity improvement and congestion relief o Opens alternative travel paths o Does not address long-term areawide needs. o Forms basis of more extensive long-term improvements	o R/W Acquisition o Directional signing o Access to community o Reduction of open space o Community noise and visual impacts of elevated roadway o Community barrier
Improve Access to MIA	o SR 112/MIA Connector o SR 836/MIA Connector o SR 836/SR 112 Connector o NW 32 Ave/NW 21 St/ Miami Canal Bridge o SR 836/NW 25 St Interchange o NW 25 St widening	o Same as Base plus o NW 36 St Expressway	o Same as Base plus o CSX Expressway	o Same as Base plus o Metrorail Expansion	o Same as Base plus o MIA Survival Roadway program	o Same as Alt. D plus o Metrorail extension o NW 36 St. grade separations o SR 836/SR 112 Connector

as feeder roads for new freeways. It appears that introducing major new freeway corridors may address regional traffic needs but may also worsen the traffic problems of the MIA area.

MICROSCALE ANALYSIS

Microscale analysis is a sketch-level design technique for assessing the general feasibility of proposed transportation corridor improvements. This level of analysis was included in the MIA Transportation Study project to identify conceptually those components of the subarea alternative transportation systems which could be effective in solving transportation problems and increasing mobility in the MIA area.

Microscale analysis is generally less intensive and less detailed than preliminary engineering. Microscale analysis identifies the following for each design option:

- Plan View
- Profile View
- Typical cross-section
- Corridor-level right-of-way requirements
- Constraints and compatibility with existing infrastructure
- Environmental land use and social impacts
- Order of Magnitude cost estimate and funding requirements

Many of the components of subarea Alternatives A through E were found to have progressed beyond microscale analysis through other efforts and had already had some level of preliminary engineering. Rather than duplicate previous or ongoing studies the Steering Committee directed Frederic R. Harris, Inc. to conduct microscale analyses of the following proposed improvements:

1) Grade separated intersection at NW 36 Street and NW 72 Avenue
2) Grade separated intersection at NW 36 Street and LeJeune Road
3) Grade separated intersection at NW 36 Street and NW 57 Avenue
4) The SR 836/SR 112 Connector
5) The SR 836/MIA Terminal Connector

The three grade separated intersections along NW 36 Street were selected for microscale analysis to demonstrate the ability of high capacity roadway improvements to increase continuity and to expedite traffic flows in the NW 36 Street corridor between SR 112 and SR 826.

The SR 836/SR 112 Connector was selected for microscale analysis to provide additional north-south capacity thus relieving existing arterials, notably LeJeune Road. The SR 836/MIA Terminal Connector was selected for microscale analysis to serve traffic approaching the MIA Terminal from SR 836 on an exclusive roadway with a minimum of conflict with other traffic on LeJeune Road.

These microscale analyses are documented in detail in Technical Memorandum 3: FORMULATION AND ASSESSMENT OF ALTERNATIVES and were considered by the Steering Committee in formulating the recommendations contained in Chapter VI of this report.

VI. RECOMMENDED IMPROVEMENTS

This chapter presents the recommended transportation improvements resulting from the Miami International Airport Transportation Study. Improvement strategies, priorities and funding requirements are also identified.

IMPROVEMENT STRATEGIES

Early in the planning process it became evident that roadways in the MIA area are subject to high levels of traffic congestion that greatly restrict access to the MIA complex and mobility within the surrounding area. LeJeune Road, NW 36th Street and SR 836 are particularly subject to congestion during peak travel periods and throughout the day. As travel demands increase, due to growth in air travel and growth in the development of Dade County, the level of traffic service on area roadways will continue to deteriorate.

Extensive roadway and public transportation improvements are critically needed both to address existing roadway deficiencies and also to serve future transportation demands. The existing MIA facilities are located in a heavily built-up and rapidly developing section of Dade County that exhibits complex social, economic, environmental and land use characteristics. In this setting, large-scale transportation improvements will not be readily implemented.

In order to address the extensive transportation needs of the MIA area the Steering Committee developed a framework of three ground transportation strategies which are essential to maintaining and improving ground access and mobility within the Miami International Airport Transportation Study area.

These strategies were designed to focus upon transportation improvements from among the alternatives studied which have the greatest potential for:

- Solving critical transportation problems and improving travel mobility in the MIA area.
- Expediting schedule-sensitive Airport-related traffic without experiencing delays due to other non-MIA Traffic.
- Enabling non-Airport traffic to travel with a minimum number of conflicts with Airport traffic.

The strategies that focused upon recommended transportation improvements which are important to the MIA area are as follows:

1) Wherever possible, ground traffic approaching or departing MIA should be carried on separate, exclusive rights of way.

2) Specific transportation improvements are to be programmed for design and construction as soon as funding availability permits. These near-term improvements include:

   - o Intersection improvements (turn lanes, storage lanes, traffic signal improvements, etc.) in selected sites within the roadways surrounding MIA.
   - o Construction of new SR 826, SR 836 and SR 112 expressway interchanges to serve MIA traffic by providing alternative route options.
   - o Modifying existing expressway interchanges to increase their capacity.
   - o Selected roadway widenings to add through-traffic lanes.
   - o Direct connection between MIA and the rapid transit system.

   In many instances these improvements can be constructed in the near term and with a minimum of right-of-way acquisition.

3) Longer range transportation improvements which have impacts in a regional context and which also provide beneficial service to MIA are recommended for inclusion in the countywide transportation plan for Dade County. These improvements include:

   - o New expressway corridors
   - o Major expansion of the rapid transit system

   These will require further study.

   In many instances significant right of way acquisition will be required and construction will be complex. Extensive funding will be needed. However, these long range improvements are key components of the MIA ground transportation recommendations.

RECOMMENDED IMPROVEMENTS/PRIORITIES

The MIA Transportation Study Steering Committee has proposed transportation improvement priorities for recommendation to the Transportation Planning Council and to the Metropolitan Planning Organization. The recommended improvements were derived based on analysis of long range transportation systems alternatives as described in Chapter V of this report and were developed within the context of the needs of the MIA study area. The MIA transportation improvements cannot all be implemented at the same time because of design and funding constraints and the need to maintain traffic and should be considered together with other high-priority county-wide transportation needs. The recommended improvement projects are categorized by implementation priority as follows:

Category 1: These improvements are to be implemented as soon as design plans production and funding permits.

Category 2a: These improvements are recommended for further study and near-term implementation.

Category 2b: These improvements are recommended for further study and long-term implementation.

These are summarized in Table VI-1 and are shown graphically in Figure VI-1.

TABLE VI-1 RECOMMENDED IMPROVEMENTS

Project Location and Limits	Type of Improvement	Approximate Cost (million)	Remarks
CATEGORY ONE: IMMEDIATE IMPLEMENTATION			
o SR 112/MIA Terminal Connector	New 4 lane Roadway	13	Construction 1/89
o SR 836/MIA Terminal Connector	New 4 lane Roadway	13	
o Terminal Lower Drive Improvements		20	Included with Airport Construction Program
o SR 826 at NW 25 St.	New Interchange	15	
o NW 25 St. - SR 826 to NW 67 Ave.	Widen to 4 lanes	3	
o NW 16 St./NW 67 Ave. plus NW 25 St. to MIA Cargo Area	Widen to 4 lanes	3	Included with Airport Construction Program
o NW 36 St. - SR 826 to NW 57 Ave.	Widen to 6 lanes	5	Design Complete. R/W being acquired.
o Bridge over Miami River Connecting NW 21 St. to NW 32/37 Ave.	New Bridge plus Roadway improvements	7	
o SR 112 at NW 32 Ave.	New Interchange	3	
o SR 112 at NW 37 Ave.	New Interchange	4	Plus Connector to existing Tri-County Commuter Rail Station.
o SR 836/LeJeune Rd.	Improve/reconstruct existing interchange	3	
o SR 836/NW 57 Ave.	Improve/reconstruct existing ramps	1	

Table VI-1 Recommended Improvements (continued)

Project Location and Limits	Type of Improvement	Approximate Cost (million)	Remarks
CATEGORY ONE: (continued)			
o NW 36 St. at LeJeune Rd.	Grade separated intersection	7	
o NW 36 St. at NW 72 Ave.	Grade separated intersection	5	
o LeJeune Rd. - SR 836 to NW 21 St.	Relocate and widen plus ramp to NW 21 St.	2	

* Cost estimates are in 1988 dollars and include the costs of construction and land acquisition but do not include the costs of acquiring buildings in the right-of-way, business damages or relocation costs.

Table VI-1 Recommended Improvements (continued)

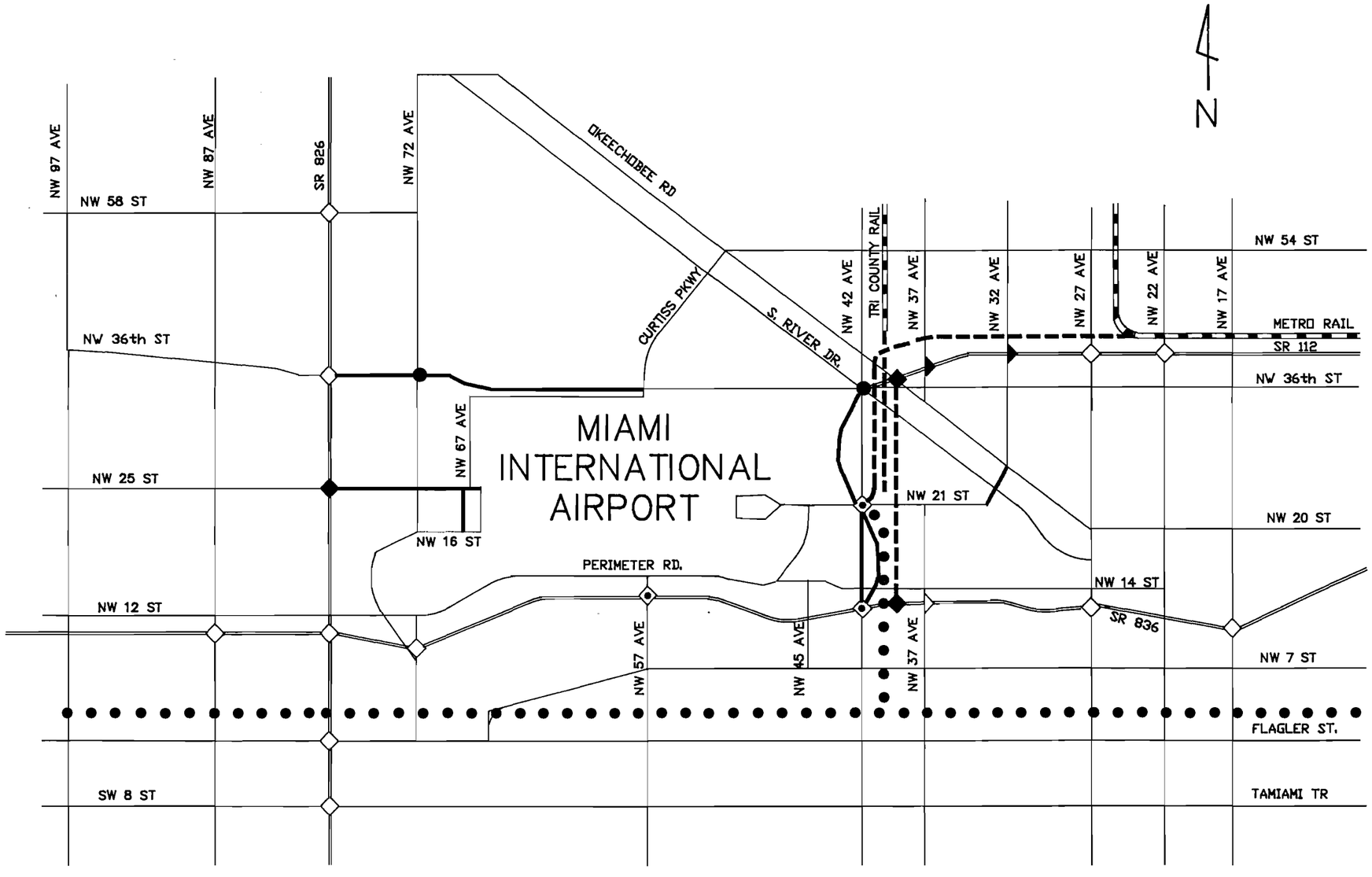
CATEGORY 2a: FURTHER STUDY/NEAR TERM IMPLEMENTATION

- New Transit Connector from Earlington Heights to Airport Area
- SR 836/SR 112 New Connector Expressway
- Tri-County Rail Station serving Terminal Area

CATEGORY 2b: FURTHER STUDY/LONG TERM IMPLEMENTATION

- Metrorail System Expansion including:
  1) East-West line from Downtown to 107 Ave.
  2) Connector from MIA to East-West line.

- MIA Multimodal Transportation Center Located to East of Airport Linking:
  1) Metrorail
  2) Tri-County Commuter Rail
  3) High Speed Rail
  4) Surface Bus



LEGEND

- FREEWAY
- SURFACE STREET
- EXISTING INTERCHANGE
- PROPOSED INTERCHANGE
- EXISTING PARTIAL INTERCHANGE
- PROPOSED PARTIAL INTERCHANGE
- PROPOSED MODIFIED INTERCHANGE
- PROPOSED GRADE SEPARATION
- EXISTING RAIL
- FUTURE RAIL

IMPLEMENTATION PRIORITIES

- CATEGORY 1: IMMEDIATE IMPLEMENTATION
- CATEGORY 2a: NEAR TERM IMPLEMENTATION
- CATEGORY 2b: LONG TERM IMPLEMENTATION

NOTE: CORRIDOR ALIGNMENTS AND INTERCHANGE LOCATIONS ARE FOR GRAPHIC ILLUSTRATIVE PURPOSES ONLY AND DO NOT REFLECT FINAL ALIGNMENTS.

FIGURE VI–1

RECOMMENDED IMPROVEMENTS