

Dade County
Metropolitan Planning
Organization

**Dade County
Transit Corridors
Transitional Analysis**

**Corridors
Evaluation
Report**

Executive Summary

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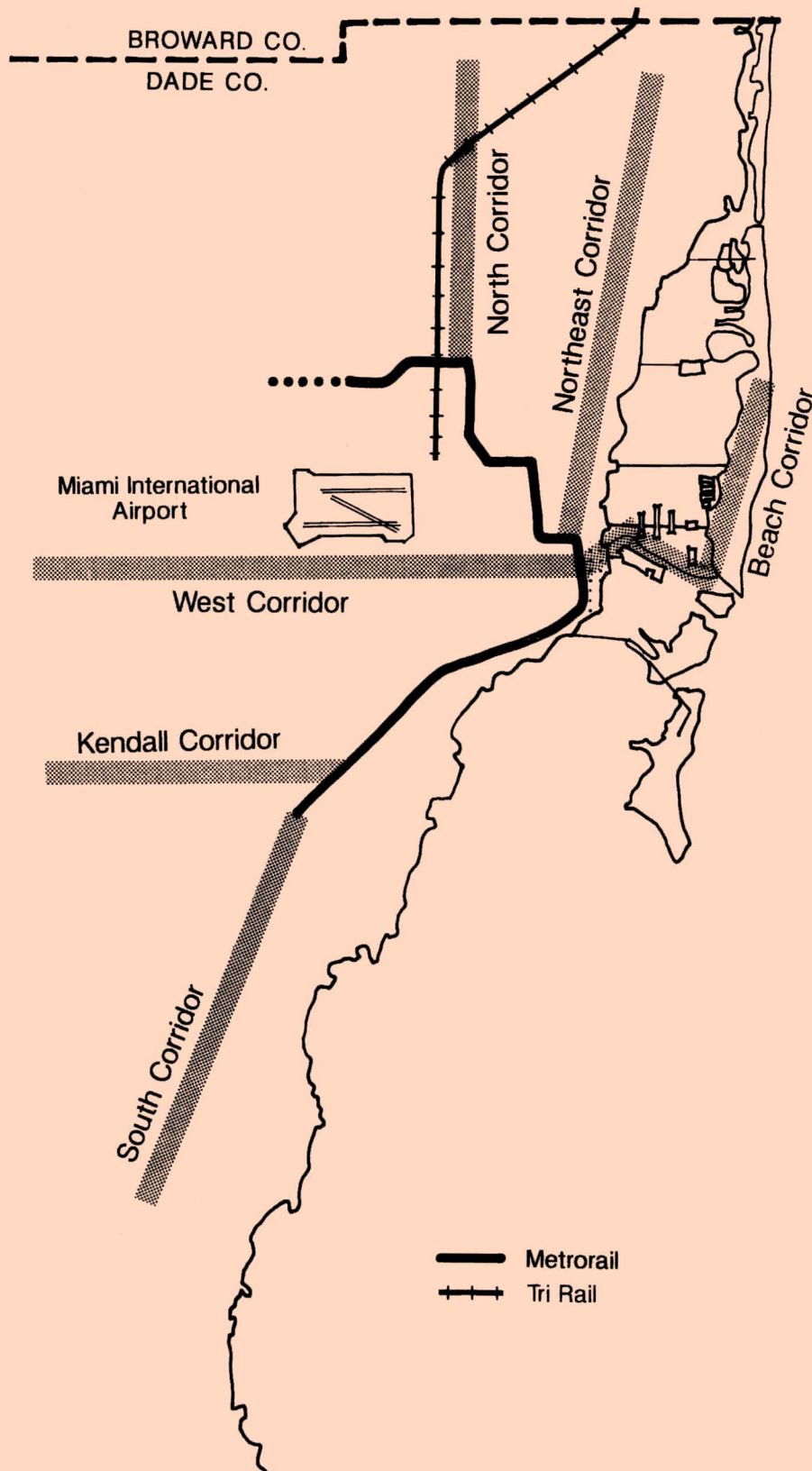
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Dade County Transit Corridors Transitional Analysis

Candidate
Corridors
Studied



NOT TO SCALE

Figure E.1

EXECUTIVE SUMMARY

Study Purpose

The Transit Corridors Transitional Analysis is being conducted by the Dade County Metropolitan Planning Organization to identify and evaluate transit alternatives in six corridors within the County. These six corridors were recommended for further study in the Metro Dade Year 2010 Transportation Plan prepared in 1990 by the County. This plan identifies that the future travel needs of these six corridors are beyond most roadway-oriented solutions. The transit improvement alternatives identified for each corridor are described, analyzed, and evaluated and a set of the most promising alternatives presented for possible further consideration and development.

Corridors Considered

The six corridors under study (see Figure E.1) are:

South: Dadeland South Metrorail Station to Homestead/Florida City (19.2 miles -- includes the programmed 9-mile South Dixie Busway between Dadeland South and Cutler Ridge)

Kendall: Dadeland North Metrorail Station to SW 137th Avenue (7.5 miles)

North: Dr. M.L. King Jr. Metrorail Station to NW 215th Street (8.5 miles)

Northeast: Downtown Miami to NE 199th Street (13.6 miles)

Beach: Downtown Miami to 71st Street on Miami Beach (10.9 miles)

West: Downtown Miami to Florida International University at the Homestead Extension of the Florida Turnpike (HEFT) (12.1 miles) with direct connection or branch service to Miami International Airport.

A seventh element which combines aspects of both the West and Beach Corridors, including a connection between Miami International Airport and the Seaport via downtown Miami, is also analyzed and evaluated:

West-Beach: Florida International University to the Miami Beach Convention Center via downtown Miami with a direct connection or branch service to both the airport and the Seaport (22.0 miles)

Study Scope and Process

The Dade County Transit Corridors Transitional Analysis began in July 1991. The work includes a sequence of analytical tasks regarding:

- review and revision of a travel demand forecasting model including the incorporation of jitney service;
- development of an evaluation methodology and criteria, as well as other study methodologies;

- development and analysis of transit improvement alternatives for each corridor, including ridership and travel benefits projections, capital and operating and maintenance cost estimates, and environmental assessments, and;
- evaluation of the alternatives within each corridor and comparison of the corridor results.

The study was directed by the Metropolitan Dade County Metropolitan Planning Organization Secretariat, with guidance and review provided by technical and policy committees from Metro Dade Transit and Aviation agencies, and Florida Department of Transportation (District 6.)

******IMPLICATIONS OF HURRICANE ANDREW ON STUDY RESULTS******

The Transit Corridors Transitional Analysis looks at transportation needs and improvements based on the year 2010 projected land use, population and employment patterns for Dade County. These projections are based on current patterns, however, Hurricane Andrew has drastically altered these patterns in the near term. Concerns were raised as to how the aftermath of the hurricane may affect the outcome of the study. Based on an assessment of the near (next five years) and long (five to 20 years) term implications of the hurricane, the effects of the storm on the year 2010 horizon of the study will be negligible.

When Hurricane Andrew struck South Florida on August 24, 1992, it wrought extensive damage to homes and businesses in southern Dade County, particularly south of Kendall Drive. This resulted in two major temporary shifts in travel in Dade County. First, many residents of the affected areas relocated temporarily to northern Dade County and Broward County. These people were added to those already commuting south to jobs in downtown and other employment areas in Dade County and reduced travel from the south to central Dade County. Second, southern Dade County, which had been primarily residential, became a major employment center as repair crews, insurance agents, and others began commuting from residences and hotels in northern Dade County to effect repairs in the damaged areas.

However, these effects are primarily temporary. Although some people have permanently relocated from southern Dade County, most residents are expected to return as their homes again become habitable. Other homes and lots are expected to be sold and new residents will move into the area as conditions return to normal. As repairs progress the volume of southbound traffic by repair crews and workers will also subside. The distribution of population is expected to be nearly restored within the next several years and business is expected to be restored to its former level within approximately the same time.

Some reports suggested that it would be many years before the affected areas return to normal. In some respect there will be lasting remnants of the storm for many years as some buildings or other elements such as fences will not quickly be rebuilt and damage to trees and vegetation will be visible for many years. However, these impacts of the storm will not greatly affect travel patterns in the longer term.

The future of the Homestead area is more affected by the future use of Homestead Air Force Base. The status of the base has not been determined at this time and plans for alternate uses for the airfield and associated land are under consideration. However, since the transit improvements under study in the South Corridor do not serve the air base market, the status of the air base is only peripherally tied to the transit improvements. Thus, Hurricane Andrew will not have a significant long term effect on the transit corridors under study.

Transit Proposals in Response to Hurricane Andrew

In the aftermath of Hurricane Andrew which extensively damaged south Dade County, several proposals have been, or are being, considered as means to extend fixed guideway transit service as soon as possible into devastated areas. The purpose of

these immediate-response proposals is to provide additional transportation service, demonstrate a commitment to rebuilding south Dade County, and act as a stimulus and focus for redevelopment.

The **South Dade Transit Linkage** is a proposal to extend Tri-Rail from the Miami International Airport to the Metrorail Dadeland North Station via existing FEC and former CSX railroad right of way. The South Dixie Busway, whose northern terminus is at the Dadeland South Metrorail Station, is extended northward to the Dadeland North Station. These extensions combine to form a transit hub at Dadeland North combining Metrorail, bus, and Tri-Rail services. The transit linkages provided by this program serve additional markets to those served by the Transitional Study South Corridor alternatives and will complement rather than compete with or preclude each other.

Transit Modes Considered

Eight public transit modes may be applied to meet transit needs in Dade County. The key features and operating characteristics of each mode are outlined below. Within these general outlines, variations in specific details are possible. Table E.1 indicates the various modes considered in each corridor.

**TABLE E.1
POTENTIAL APPLICATION OF MODE TECHNOLOGIES**

	Priority Bus Lanes	Express Busway	Light Rail Transit*	Metrorail		Local Bus/Jitney**	Notes
SOUTH		•		H	S	O	
KENDALL	•	•		H	S	O	Busway and bus lanes combined in one alternative
NORTH	•				S	O	
NORTHEAST		•	S	H	S	O	
BEACH			S			O	
WEST			S	H	S	O	Various alignments
WEST-BEACH			H			<u>O</u>	Dedicated bus/van service
• Line-Haul Service Mode Alternative S Standard LRT or Metrorail H "Hybrid" LRT or Metrorail				O Background Service Mode <u>O</u> Special Service			

*"Hybrid" rail transit vehicles can operate both on Metrorail lines and in mixed traffic or with at-grade crossings.

**Local bus service may include regular buses, minibuses, and/or jitneys. Special airport-seaport bus service represents existing cruise company bus services.

Local On-Street Minibus/Jitney

This mode represents minibuses and jitney services presently operating in Dade County. Minibus service operates in mixed traffic making frequent stops and may provide feeder service to another mode such as Metrorail. Significant features include:

- Serves light passenger volumes
- Slow speed
- Dense localized network useful for short trips
- Extremely flexible routing and scheduling

Local On-Street Bus

This mode represents the majority of Metrobus routes operating in Dade County. Local bus service operates in mixed traffic making frequent stops and may provide feeder service to another mode such as heavy rail. Significant features include:

- Serves light to heavy passenger volumes
- Slow speed
- Dense areawide network useful for short to medium length trips
- Flexible routing and scheduling

Priority Bus Lanes

Priority bus lanes or transitways are characterized by buses operating on exclusive bus lanes along a street and making periodic stops. A busway may be located in the median of a roadway or may consist of restricted lanes available full time or only during peak flow periods along the sides of the roadway. The speed of service depends on the spacing of stops and degree of separation from other traffic. Significant features include:

- Serves medium to high passenger volumes
- Slow to medium speed
- May serve short to long trips (depending on operating speed and bus stop spacing)
- May be intermixed with on-street bus operation

Express Busway

This mode is represented by express buses operating on a busway or separate bus lane along a roadway or segregated right-of-way. In such service, buses normally collect passengers on local streets or at park-and-ride facilities at one end of the busway, then operate with few or no stops until reaching the other end of the busway. Express buses may serve the CBD directly or they may feed a rail transit station. Significant features include:

- Serves medium to high passenger volumes
- Primarily serves long distance commuter trips
- Buses may continue on a local collector route to provide a one-seat ride without transfers
- May operate in HOV lanes with other traffic or on exclusive lanes
- High speed -- buses avoid roadway congestion by use of exclusive lanes

Automated Guideway Transit (AGT)

This mode is represented in Dade County by Metromover. AGT usually operates as a local distribution system. Because it is automated (driverless), AGT systems operate on an exclusive right-of-way. Significant features include:

- Serves low to medium passenger volume
- Medium speed
- Serves short to medium length trips
- Automated, control by computer with supervision from central control center
- Must be grade separated throughout
- Stations spaced 1/4 to 1/2 mile apart
- Cars may operate alone or in pairs

Light Rail Transit (LRT)

Light rail transit is a flexible mode which can operate in a variety of settings. Key distinctions between light and heavy rail are light rail's use of overhead power collection as opposed to the track-level third rail used by heavy rail and light rail's shorter trains of articulated vehicles. With overhead power collection, light rail trains can operate in mixed traffic like streetcars, on an at-grade right-of-way with street and pedestrian crossings, or on a fully segregated right-of-way. Since passengers can walk across tracks, stations can be simple with low platforms or use high platforms for faster loading and unloading.

Significant LRT features include:

- Serves medium to high passenger volume
- Low to high speed (depending on degree of separation of right-of-way and distance between stops)
- May serve short to long distance trips
- Normally uses overhead power collection, but may also use third rail
- May operate in mixed traffic, with cross-traffic, or on exclusive right-of-way
- Stations may be elaborate or simple. May use low platforms, high platforms, or both
- Stations spaced 1/2 to 1 mile apart
- Vehicles may operate alone or in trains of up to four vehicles
- Lower capital cost than heavy rail
- Lower environmental and neighborhood impacts than heavy rail
- May be automated where exclusive right-of-way is used
- Fare collection may be performed in stations, on board vehicles, or both

Hybrid Light Rail Transit ("Hybrid" LRT)

A light rail transit option which may be of particular interest in Dade County is a "hybrid" vehicle which can operate both on Metrorail tracks and on tracks with street crossings or in mixed traffic. Such a vehicle would be equipped to collect power both from a third rail (for operation along existing Metrorail lines) and from overhead catenary wires (where street crossings or mixed traffic is present), would have both high and low platform access, and would be compatible with both automatic operation on Metrorail and manual operation where grade crossings are present. In this study, this configuration is referred to as "hybrid" LRT while the typical configuration (no third rail power collection) is referred to as standard LRT.

In addition to its ability to operate on Metrorail guideways, significant "hybrid" LRT features are the same as those listed above for standard LRT.

Heavy Rail

This mode is represented in Dade County by Metrorail. Heavy rail, which collects power from a "third rail", must be on an exclusive guideway throughout -- vehicle or pedestrian crossing of tracks is not possible. Heavy rail provides the highest passenger capacity and fastest service possible but at the highest capital cost. Significant features include:

- Serves high passenger volume
- Medium to high speed
- Serves medium to long trips
- Must be an exclusive right-of-way throughout (no crossings)
- Highest per-unit capital cost
- Must use high platforms
- Power collection from "third rail"
- Medium to long trains (usually 4 to 10 cars)
- Stations spaced 3/4 to 1-1/2 miles apart

"Hybrid" Metrorail

In several of alternatives, Metrorail vehicles, which pick up their propulsion power by means of a third rail, would be equipped with a roof-top pantograph to pick up power from an overhead wire, and be able to operate like a light rail transit line. In this study, this configuration is referred to as "hybrid" Metrorail.

Significant features of "hybrid" Metrorail for this study include:

- Operates on existing or future Metrorail guideways.
- Reduces cost of Metrorail extensions by allowing at-grade construction with street-level crossings.
- Can use existing Metrorail vehicle fleet and maintenance and storage facilities.

Commuter Rail

This mode is represented in South Florida by Tri-Rail. Commuter rail service uses typical railroad technology to provide long distance, high speed commuter service. Commuter rail service typically consists of unpowered passenger cars pulled by a locomotive. In the case of Tri-Rail, diesel locomotives pull bi-level coaches. Significant features include:

- Serves medium to high passenger volume
- Medium to high speed
- Serves long trips
- Normally on railroad right-of-way, may have street crossings
- High or low platforms (Tri-Rail uses low platforms only)
- Diesel locomotive power (as with Tri-Rail) or electric locomotive power from overhead catenary wire
- Medium to long trains (usually 4 to 10 cars)
- Stations spaced 2 to 6 miles apart

Commuter rail was not considered for the corridors under study due to its wide station spacing, orientation to longer distance travel and general operating characteristics.

SUMMARY OF CORRIDORS

Ridership and Travel Benefits

The West-Beach Options by far, generates the most riders and travel benefits of all the corridors. As separate corridors, the West Corridor and Beach Corridor rank next highest in terms of new transit riders and line passenger boardings, followed closely by the Northeast Corridor. The South Corridor has a fairly high number of boarding passengers but most are existing riders diverted from existing transit services. Both the Kendall and North corridors have modest ridership volumes, although the North Corridor rail options attract a much higher number of new transit riders.

Capital Costs

As a group, the West-Beach Options are the most costly because they are relatively long (with the exception of the South Corridor) and involve several expensive crossings of rivers and other obstacles. The South Corridor, being the longest, is the next most costly group, followed by the West Corridor. The North and Kendall Corridors are lower in cost than the above corridors because of their shorter length. The Beach Corridor is the least costly as a corridor by virtue of the relatively inexpensive at-grade light rail transit mode considered.

The busway alternatives are the least costly modal option. The at-grade light rail transit and "hybrid" rail transit are less costly on a per mile basis than the Metrorail options because they can have at-grade crossing of roadways and relatively simpler stations. The fully exclusive guideway and stations required under the Metrorail alternatives, make them the most expensive group of options.

Operating and Maintenance Costs

In general, the longer the corridor, the higher the O&M cost. The West-Beach Options as a group are the most costly to operate because they involve the longest route lengths and represent, for the most part, a separate line from the existing Metrorail system. For similar reasons, the West Corridor alternatives are the second costliest group. The rail alternatives for the South, North, Northeast, Beach, and Kendall Corridors have a similar order of magnitude costs. The busway options have small cost increases given that they represent TSM bus service plans operating over new guideways.

Many of the alternatives, particularly the rail options, free up bus vehicles which can be used for service in other areas of Dade County.

Environmental Assessment

The alternatives considered in this study were developed to avoid or minimize impacts to existing communities and the man-made and natural environments. Alignments or transit modes that would have major community/environmental impacts were screened out from consideration early in the study process. The alternatives considered in this study do have some impacts; however, most can be mitigated. Nevertheless, there are some impacts associated with the construction and/or the operation of an alternative which vary among the different alternatives and particularly among the different corridors. These are highlighted in the Summary Evaluation below.

Air quality is an important environmental concern, particularly given the requirements of the federal Clean Air Act of 1990. Transit improvements are generally regarded as having a beneficial effect on air quality and part of an overall regional air quality improvement program. Key indicators of the degree to which the various alternatives improve air quality are the number of auto trips diverted to transit and the diverted number of auto vehicle miles travelled (VMT), as these are measures of the reduction in auto emissions. Diverted auto trips and VMT are presented in the evaluation matrix for each corridor. Generally those alternatives that attract the most new riders, such as the West-Beach options, have the greatest reductions in auto trips and VMT, and therefore auto emissions. While the amount of reductions in any one corridor may not be large on a regional basis, they nevertheless contribute to an overall program to improve air quality.

Summary Evaluation

This study examined and evaluated sets of transportation improvement alternatives for seven corridors in Dade County. The results of the technical analyses are presented and various indicators of performance, benefits, costs and impacts are listed and used to identify those alternatives and corridors, of those considered, that represent the best opportunities for transportation investment. To the extent possible within the scope of this systems level of technical analysis, consideration of community and environmental impacts and sensitivities have been incorporated into the development and evaluation of the alternatives. An ongoing financial analysis is examining the resources and opportunities to fund the construction and operations of potential improvements.

The following findings can be drawn from the results of the technical analysis presented above:

- The **South Corridor** busway alternative, which is an extension to the programmed South Dixie Busway to Cutler Ridge, represents a relatively low cost, and cost effective option for the South Corridor. Although it does not attract as many new riders as the rail options, it does carry nearly the same number of total riders. This option provides improved access for bus riders and improved operating reliability to the Metrorail from south Dade County. The rail extension alternatives attract more new ridership but at a higher cost.
- The alternatives in **Kendall Corridor** improve access and travel times for existing riders but only attract relatively modest new ridership compared to the investment required. Therefore, the transit service improvements included in the TSM alternative for this corridor, enhanced with some modest capital projects such as traffic queue by-pass lanes and other transit priority treatments at selected locations, represent an inexpensive, non-disruptive, and effective means of addressing the transportation needs in the Kendall Corridor.

- Improvements in the **North Corridor** attract many new riders as well as serve existing users. The rail extension straight up NW 27th Avenue is the most attractive investment for the corridor. The bus lane is a cost effective, lower cost investment, although its transportation benefits are modest as it carries only about a third of the riders as the rail options and only attracts about a third as many new transit trips. The required street widening under the bus lane alternative raises serious community impact questions because of the loss of parking and associated business and property impacts.
- The **Northeast Corridor** busway is a very cost effective and relatively low cost option. It gains more new riderships than any of the rail options examined in the corridor and costs substantially less to build and operate. Of the Northeast Corridor rail alternatives, Standard Light Rail Transit is the most cost-effective. It generates comparable ridership benefits to the other rail alternatives, but at a lower capital cost and operating and maintenance cost. Because these alternatives run along the existing FEC railroad right of way, the community and environmental impacts are minimal. The Northeast Corridor Busway has the best FTA C/E index of all the alternatives considered in this study.
- The **West-Beach Options** represent an opportunity to provide a major transportation improvement to better serve existing riders, attract a large number of new riders to transit, and provide a economically-valuable direct connection between the Miami International Airport and the Seaport as well as to Florida International University. While the benefits are great, so is the investment. The two components that comprise this corridor -- **West Corridor and Beach Corridor** -- each are viable, beneficial, and reasonably cost-effective investments by themselves, especially the Beach LRT. This opens up the opportunity for staged implementation of an overall program for the corridors based on availability of funding. The alignment in the West Corridor and the connection the Beach across Biscayne Bay require more detailed analysis to determine the preferred configuration.

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