

**MIAMI, FLORIDA**  
**SOUTH MIAMI-DADE BUSWAY**

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## **MIAMI, FLORIDA (USA)**

### **South Miami-Dade Busway**

The 8.2-mile South Miami-Dade Busway, opened in February 1997, connects the Dadeland South Metrorail Station with Cutler Ridge. It was built mainly on abandoned rail rights-of-way at a cost of \$59 million—slightly over \$7 million per mile. Plans call for extending the Busway another 17 miles to Florida City.

Six bus routes operate on all or part of the Busway; one of these—the Busway MAX—operates on an express schedule during peak periods. Weekday ridership (2001) exceeds 12,000 and represents about a 70% gain over pre-Busway ridership in 1996.

#### **CITY CONTEXT**

The Miami-Dade urban area has a population of 2.3 million (2000) and a downtown employment population of more than 50,000. Bounded by Biscayne Bay in the east, and the Everglades in the west, it continues to grow rapidly.

The urban area is served by an extensive network of free and tolled express highways and a comprehensive multi-modal public transport system that includes Metrorail, central area people-movers, and an extensive network of Metro-bus local and express bus routes. The 8.2-mile (13 kilometer) South Miami-Dade Busway, which opened in February 1997, connects the Dadeland South Metrorail Station with Cutler Ridge and provides bus service to southeastern parts of Miami-Dade County.

#### **PLANNING/IMPLEMENTATION BACKGROUND AND CORRIDOR OVERVIEW**

The South Miami-Dade Busway corridor, located in the southern part of Miami-Dade County, Florida, is 25 miles (40 kilometers) long, connecting the Dadeland South Metrorail station and Florida City ([Figure 1](#)). Development originally took place in the early years of the twentieth century along Henry Flagler's Florida East Coast Railroad from Miami to Key West.

US Highway 1 was built parallel, and mostly adjacent to, the existing railroad right-of-way <sup>1</sup>. The corridor around the existing Busway primarily contains the middle and upper-middle class suburbs of the City of Miami. To the south are farming areas, small unincorporated village-like settlements, and the cities of Homestead and Florida City, approximately 25 miles (40 millimeters) from Dadeland South. Subsequent portions of the Busway will be built to serve this area.

The County's Long Range Transportation Plan envisions that population in the southern portion of Miami-Dade County will increase by about 185% between 1990 and 2020. Along with this population increase, there will be a 175% increase in automobiles and the associated traffic congestion <sup>2</sup>. Because there are no plans for a

significant increase in roadway capacity in the area, the Long Range Plan designated the US 1 corridor as one of the corridors for a high passenger capacity transit facility.

In 1988, the state of Florida purchased the abandoned right-of-way of the Florida East Coast Railroad in South Miami-Dade to enable future construction of such a facility. The state was seeking a cost-effective way to provide high-capacity transit in a medium-density, suburban corridor. A successful demonstration in Miami-Dade County could be replicated elsewhere in the state.

This corridor runs through the heart of the area devastated by Hurricane Andrew in August of 1992. With over \$20 billion (US) in damage, that event was the costliest natural disaster in the history of the United States. As part of the recovery from the hurricane, plans were initially drawn for an at-grade heavy rail rapid transit line that would extend the County's Metrorail, which opened in 1984. The estimated cost of this extension was \$300 million (US). Even with all of the recovery funds available after the hurricane, \$300 million was believed to be too expensive for a transit facility in the corridor.

After rejection of the at-grade heavy rail line extension because of prohibitive costs, the state began considering lower-cost options and finally decided on an at-grade Busway.

#### **BUSWAY DESCRIPTION AND OPERATIONS**

The South Miami-Dade Busway is an 8.2-mile (13 kilometer), at-grade roadway for exclusive use by buses and emergency/security vehicles. The Busway, which was built mainly in an abandoned railroad right-of-way, connects the Dadeland South Metrorail station with Cutler Ridge. Areas east, west, and south of the Busway are served by bus routes that provide local and limited-stop service on the Busway and in the neighborhoods between Florida City and the Dadeland Metrorail.

The Busway was built by the Florida Department of Transportation and is used by buses operated by the Miami-Dade Transit Agency (MDTA). The direct costs were \$42.9 million for construction, and \$17 million for the allocated right-of-way costs. Thus, the total cost of the 8.2-mile Busway was \$59.9 million, slightly over \$7 million per mile<sup>1</sup>.

Six bus routes operate on all or part of the Busway; one of these—the Busway MAX—operates on an express schedule during peak periods. Weekday ridership (2001) exceeds 12,000 and represents a 70% gain over pre-Busway ridership in 1996.

MDTA transit services over 80,000,000 passengers annually, and weekday boardings exceed 250,000. More than 70% of South Miami-Dade residents are within walking distance of a Metrorail, Metrobus, or Metromover stop.

## DESIGN FEATURES

The Busway is located to the west of US 1. [Figure 2](#) shows the configuration of the Busway and its relationship to the adjacent bicycle path and US 1. Except for the approach to the Dadeland South Metrorail station, the bus lanes are located in the center of a 100-foot (30-meter) right-of-way. Each lane is 12 feet (4.0 meters) wide. Lanes are divided by a 4-foot (1.2-meter) striped median. The bicycle path located to the west of the paved bus lane is about 8 feet (2.4 meters) wide. To the east of the paved bus lanes, there is a deep swale to capture runoff. The swale and the areas on either side of the bicycle path are heavily landscaped. A 3-foot- (1-meter-) high fence was installed along the western edge of the alignment. [Figure 3](#) shows a typical view of the Busway and bicycle path. At the approach to Dadeland South, the right-of-way narrows; there is no swale or median, and the bicycle lane is separated from the bus lanes by a curb. [Figure 4](#) shows the Busway in the Dadeland South environment.

## STATIONS

There are 15 stations in each direction along the Busway. The Busway width varies from 28 feet to 52 feet at stations to enable express buses to bypass stopped vehicles. Stations are long enough to allow several buses to stop at the same time.

Stations are simple, yet attractively designed. [Figure 5](#) is a typical Busway station. Each station has a large, waterproof, translucent fiber canopy extending over the waiting area and partly over the roadway. They are designed to protect passengers from getting wet when boarding and alighting buses during the frequent tropical rainstorms that occur in South Florida. Each station has pay telephones and benches. Highway-type streetlights, walkway lights, and special lights to illuminate the canopy provide lighting for passengers. Signs give bus route descriptions and maps (see [Figure 6](#)).

In the vicinity of the stations, the bicycle path is located at the extreme west side of the right-of-way so that it is behind the canopy. This arrangement separates the bicyclists and skaters from waiting transit passengers.

Stations are located at major intersections and are spaced about 1/2 mile (1 kilometer) apart. At most intersections, the stations are located on the far side of the intersection. At two locations, stations are positioned between intersections. One of the stations serves a vocational school, and the other serves a major strip mall. There is an intermodal terminal at the Dadeland South Metrorail station located at the north end of the Busway. This facility is described in detail later.

About 1/2 mile (1 kilometer) to the south of the southern end of the Busway, there is a park-and-ride lot on the property of the Cutler Ridge Mall. There are few shoppers and, therefore, a large number of available spaces in the area of the lot where Busway riders park. The lot is maintained by the shopping center and is located across the street from the South Miami-Dade Government Center, a complex of buildings including a regional library, police station, administrative offices, and courts. Another park-and-ride lot was built at about the midway point of the Busway, at SW 152nd

Street. This 100-automobile lot is adjacent to the Busway station and is on the property of a county golf course. The lot is used by commuters on weekdays and by golfers on weekends.

#### INTERMODAL TERMINAL

An intermodal terminal was developed at the Dadeland South Metrorail station where most Busway riders board or alight. The station, opened in 1984, allows convenient intermodal transfers among Metrorail, Metrobus (the county's conventional bus service), and automobiles. Pedestrian access and bicycle lockers are provided at the station.

A private developer built the Datan Center, consisting of two office buildings, a Marriott Hotel, and a 2000-automobile parking garage adjacent to the station. The parking is used by Metrorail passengers and the employees/visitors of the Datan Center. The garage is physically located above the four bus bays, in a tunnel-like setting. The transit agency rents approximately half of the parking spaces from the developer, who maintains the parking garage and access to and from Metrorail elevators and escalators. There are several hundred more parking spaces under the Metrorail guideway to the north of the station.

To accommodate a Busway terminal, with its large number of passengers transferring between Metrorail and Busway services, the arrangement of facilities at Dadeland South was changed dramatically. Construction was carried out while maintaining all the passenger flows. There are about 5,300 Metrorail boardings at Dadeland South and about 1,180 automobiles parked each weekday <sup>4</sup>. The Metrorail parking facilities at Dadeland South are typically 92% full each weekday <sup>5</sup>.

A new kiss-and-ride area was built in the surface parking lot north of the station and includes a new covered station entrance with turnstiles, phones, waiting areas, stairs, and an escalator. The old kiss-and-ride area was converted into the new five-bus bay Busway terminal with a U-turn built under the north end of the platform to accommodate turning buses. The buses coming into the station typically run through the old tunnel terminal (with its four bus bays), turn around in the U-turn area, and then stop at one of the five new Busway terminal bus bays for their southbound trip.

Each bus bay is assigned one or two Busway routes. The west (tunnel side) bus bays are used by northbound buses, and the east (Busway side) bus bays are used by southbound buses. Because there are more Metrorail turnstiles at the west side bus bays than on the east side of the station, in the morning peak period, buses discharge at a tunnel bus bay, use the U-turn, and then stop at a Busway terminal bus bay to pick up southbound passengers. Also, to facilitate the transfer between bus and rail, there is no transfer charge for this movement. Northbound Busway boarding passengers are given a transfer to Metrorail on request at no extra charge.

A stairway at the south end of the Metrorail station was converted to an escalator. This new escalator improved vertical circulation at the station. There are three escalators, two sets of stairs, and an elevator for use by passengers using Metrorail.

### **HIGHWAY AND TRAFFIC ASPECTS**

US 1 is a six-lane, divided, at-grade roadway that parallels the Busway. The two facilities are located next to each other for about half the length of the Busway. At the approach to Dadeland South and south of SW 160th Street, the Busway is situated west of US 1, behind commercial establishments, and is as far as ¼ mile (1/2 kilometer) away from US 1.

Traffic on US 1 varies from about 30,000 vehicles per day in the Cutler Ridge area to about 90,000 approaching the Dadeland area. There are signalized intersections about every ½ mile (1 kilometer). The Busway crosses 20 major signalized intersections; 11 of these are within a 50- to 80-foot (15.25- to 24.5-meter) distance of the pavement edge of US 1.

Signals operate on cycle lengths of approximately 120 to 160 seconds depending on time of day and section of highway. Construction of the Busway required major changes in traffic controls at these locations to preclude spillbacks of east-west traffic across the Busway.

Accordingly, at these intersections, the Busway and US 1 operate as a single signalized intersection. Signals for the Busway display red unless loop detectors indicate an approaching bus. If the approaching bus can clear the intersection while US 1 through traffic continues to move, then the bus signals turn green. Otherwise, the Busway traffic waits until the next cycle.

Programmable signal heads were installed on cross streets to prevent confusion between Busway and US 1 signal heads. In addition, extensive southbound right turn lanes with right turn signal indications were added along southbound US 1. During the period that buses cross east-west roadways, the south-to-west right turn movements are prohibited. This control concept was new for the State of Florida, and considerable attention was given to educating drivers. Through public meetings and temporary signs, drivers were told, “no right turn on red.” The campaign has worked, as there have been no traffic accidents at these intersections since the Busway opened.

In the section of Busway south of SW 160th Street, the Busway and US 1 are generally separated by a 1/4 mile (1/2 kilometer). The signals along the Busway and US 1 were originally set to operate independently. The Busway detection loops gave buses a green light wherever buses approached without regard to US 1 signals. Consequently, many accidents occurred in this area. There were 14 accidents in the first 4 months of Busway operation; all were right-angle collisions that involved eastbound vehicles on cross streets conflicting with buses on the Busway. In 11 of the cases, minibuses were involved. Analysis showed that the eastbound drivers were watching the US 1 signal and ignoring the new signals at the Busway. The Busway

intersections had been under construction for over a year, and the relatively light traffic on the Busway lulled the drivers into thinking that the Busway was not yet open—an issue of driver expectancy.

To correct this situation, the following actions were taken:

1. The Busway loop detectors were disengaged and the traffic signals coordinated with those at the US 1 intersection so that US 1 and Busway traffic moved simultaneously.
2. Strobe lights were installed on the roofs of all minibuses operating on the Busway; and
3. New “Busway Ahead” and “Busway Crossing” signs were erected at the approaches to these intersections.

As a result of these actions, the accident rate was reduced significantly, resulting in only five accidents on the Busway in the year ending July 1998.

The single biggest complaint from drivers was their loss of the right turn on red maneuver when turning from east to south across the Busway. These concerns were addressed by providing an eastbound right turn lane for those movements, with a special signal indication for the lane, at the three places where there was sufficient right-of-way on the east-west street. In addition to adding the lane, the east-to-south movement was permitted during the phase when other, non-interfering turning movements were permitted. These actions resolved a major public concern at the three intersections.

At all three intersections, where there was insufficient right-of-way, actions were taken to obtain the needed property to provide the special right turn lanes as warranted. The major improvement of traffic in the corridor was the installation of protected left turn signals for both northbound and southbound traffic at all signalized intersections along US 1. Traffic engineers were looking for an opportunity to install these lanes, and the Busway provided the opportunity.

There are lingering traffic complaints. Most will be resolved when the remaining intersections have their rights-of-way expanded to accommodate traffic more effectively. At several intersections, buses are required to stop for oncoming traffic. Metro Miami-Dade Traffic has required buses to slow to 15 mph on approaches to signalized intersections to improve safety.

### **TRANSIT SERVICE DESIGN**

Since the Busway was the first of its kind (e.g., “feeder Busway”) in North America, little information was available to guide transit service planners in developing new bus routes. Four basic market research techniques were applied to gather information on the needs of both current riders and potential transit riders who could be drawn from their automobiles. These are the following:



1. Random telephone surveys of households in the Busway corridor,
2. Field surveys of drivers on US 1 in their automobiles,
3. Field surveys of passengers on existing bus routes in the corridor, and
4. Review of letters and phone calls to public officials and the transit agency, letters to the editors of newspapers, and comments from those attending public meetings.

Major findings of the market research were the following:

1. About 25% of the drivers on US 1 had destinations in the Busway corridor and were potential Busway users.
2. Current transit riders and potential Busway users were concerned about their complete trip, not just the Busway portion of their trip. For example, there are many potential users who work in areas north of the Busway, and there are many transit riders who have destination areas south of the Busway.
3. Frequency of service and personal security were significant concerns.
4. Concerns about possible traffic delays on US 1 and on cross streets were identified.

Some new transit riders wanted convenience, and current riders wanted their current travel patterns to be improved. All of these concerns were taken into account in the design of stations and of transit service on the Busway.

#### SERVICE DEVELOPMENT

In designing the service that would operate on the Busway, a number of challenges were addressed:

1. This was the first busway of its kind in North America (other than a busway replacing part of a suburban trolley serving the 69th Street station in Philadelphia).
2. Only limited resources were available for the new bus service. Accordingly, existing bus routes in South Miami-Dade were modified to operate on or to the Busway. The only additional operating funds available were for wholly new service along the Busway, and the state would provide grants only for these new services.
3. Since a change of mode was necessary for passengers using Metrorail for part of their trip, transfers between modes at other locations had to be minimized.
4. Most stations were designed with no park-and-ride or kiss-and-ride areas, nor facilities for passengers on feeder buses to transfer to and from

Busway buses. Funding was not programmed for the purchase of the additional land needed for these facilities.

With such challenges and constraints in mind, the following goals for the service design were developed:

1. Maintain the pattern of Metrobus service in South Miami-Dade as much as possible to minimize the inconvenience to current passengers.
2. Shift all bus routes operating on US 1 and the Florida Turnpike to the Busway.
3. Design a variety of services so that the overall frequency of service is high.
4. Provide one-seat rides to the maximum extent possible. Therefore, design feeder routes to circulate through residential neighborhoods along the Busway and also to operate on the Busway for a portion of the route.
5. Design other routes to serve areas north and south of the Busway. These routes would also operate on the Busway to provide one-seat service from points south of the Busway, to and from Metrorail, and to points north of the Busway.

#### ROUTE STRUCTURE

Based on the market research, fiscal constraints, and planning guidelines, a three-part service plan was designed for the Busway and surrounding areas: (1) existing routes using US 1 were diverted to the Busway, (2) new Busway MAX and local service were initiated, and (3) neighborhood collector routes were established. The service span was set at 17 hours. The routes operating along the Busway provide a combined peak-hour headway of about 3 minutes (20 buses per hour) and a midday headway of about 10 minutes (six buses per hour). [Table 1](#) describes the principal services operated.

#### ***Diverted Routes***

Two long established major bus routes in the area, Routes 1 and 52, were moved onto the Busway from US 1. The routes serve areas to the north of the Busway including the cities of South Miami and Coral Gables, as well as neighborhoods off the Busway in South Miami-Dade. Route 1 Busway provides local service 7 days a week between South Miami Heights, east Perrine, and Metrorail. The route serves all Busway stations between SW 168th Street and the Dadeland South Metrorail station inclusive. Service is every 20 minutes during weekday rush hours, every 40 minutes at midday on weekdays and on Saturdays, and every hour on Sundays. Weekday service is provided by full-size buses, and weekend service is provided by minibuses. With their diversion, no bus routes remain on US 1 where it parallels the Busway. This action has helped traffic flow on US 1 because there are no bus pullouts, or buses stopped in

moving traffic lanes, to serve passengers who require bus service beyond the Busway to, or toward, their final destinations.

### ***New Busway Routes***

Two new routes were designed to operate the length of the Busway. The Busway Local (31) serves all Busway stations between Cutler Ridge and the Dadeland South Metrorail station 7 days a week (Figure 7). The Busway Local operates every 15 minutes during the weekday rush hours and every 30 minutes at other times. The Busway MAX is a limited-stop route between Florida City and Metrorail (Figure 8). The route operates on the Busway north of Cutler Ridge and along US 1 south of Cutler Ridge serving Goulds, Homestead, and Florida City. Service between the SW 152nd Street Busway station and Dadeland South Metrorail station is non-stop during weekday rush hours; the route serves all Busway stations at all other times. The Busway MAX utilizes full-sized and articulated buses at all times and operates every 15 minutes during weekday rush hours and every 30 minutes in the off-peak hours. The Busway MAX serves the park-and-ride at Cutler Mall.

### ***Other New Routes***

Two new routes, Coral Reef MAX and Sage Bay MAX, serve neighborhoods east and west of the Busway that previously did not have transit. The Coral Reef MAX provides limited-stop service, 7 days a week, between Country Walk and the Dadeland South Metrorail station via SW 152nd Street and the Busway. The route serves Metrozoo during its operating hours. The service, provided by minibuses, runs every 20 minutes during the weekday rush hours, every 45 minutes at midday during the week, and every 40 minutes on weekends. The Sage Bay MAX is a limited-stop, weekday rush hour service between Sage Bay and Metrorail. The route, operated by minibuses, serves Busway stations between SW 168th Street and the Dadeland South Metrorail station inclusive (Figure 9). Service is every 15 minutes during weekday rush hours.

The combination of all the bus routes provides frequent service at the busiest Busway stations. In the peak periods, there are up to 20 buses per hour in each direction. It is believed that this high service frequency has been able to attain high levels of ridership.

## **TRAVEL TIMES**

A one-way trip between Cutler Ridge and Dadeland South takes about 25 minutes. The Busway provided modest time savings when opened, but with substantially improved reliability. However, after the start-up accident experience, bus speeds were reduced to 15 mph at grade crossings. This has resulted in slightly lower speeds than those along US 1 before the Busway was open.

Peak travel time between Dadeland South and Perrine was 18 minutes along US 1 before the Busway opened, 16 minutes along the Busway when it first opened, and, since 1991, has been 19 minutes.

Buses routinely travel at the 40 mph Busway speed limit. However, the US 1 schedule for all-stop service implies trip speeds of 12 to 14 mph. The MAX express services have trip speeds closer to 18 mph because the buses make fewer stops.

### **RIDERSHIP**

Transit ridership in the Busway Corridor has far exceeded expectations. In the first year, ridership was up each month approximately 50% on weekdays and weekends. Ridership has continued to grow in subsequent years, but at a more gradual rate (see [Figure 10](#)). During this same period, the rest of the transit systems had 2% fewer boardings.

In the first quarter of 2001, ridership was up 68% on weekdays and 125% on weekends over the comparable quarter in 1996. As shown in [Table 2](#), existing weekday ridership exceeds 12,000, and combined weekend ridership exceeds 13,000. Reasons cited for this increase were (1) a greater span of service, (2) more frequent service, and (3) new areas served. Except for Saturdays, revenue miles increased even faster than boardings.

Anecdotal information suggests that the ridership increases came from several sources. Passenger-related ridership increases include the following:

1. Passengers who used to drive all or part of the way to work,
2. Passengers who used to drive to Dadeland South and park there, and
3. Passengers who were transit customers in the past but now ride more often.

Service-related ridership increases include the following:

1. The high level of service frequency especially in the peak periods and
2. Provision of new routes in areas that never had transit service.

### **VEHICLES**

Both the Busway Local and the Busway MAX services were originally designed as minibus routes ([Figure 11](#)), with full-size buses used only in the peak periods. With the dramatic increase in ridership, the Busway MAX was assigned full-size, articulated buses at all times ([Figure 12](#)). Larger buses were also added to other routes as warranted. The route number, description, and destination are clearly marked on the buses. However, there is no distinct logo for Busway services. Fares are paid on vehicles.

### **MARKETING**

The marketing of the Busway had several goals. These include the following:

1. To convince drivers to use transit at least some of the time for part of their trip,
2. To let non-riders know the value of the Busway to the community, and
3. To inform then-existing transit riders of the improvements in transit service that would be possible when buses started operating on the Busway.

The marketing effort included cable television videos, brochures, and free fares during the first two weeks of operations. MDTA marketing staff worked with a local television station to develop videos at no cost to MDTA. Several 30-second spots were shown on the cable television network serving the corridor. A 4-minute video was shown at dozens of public meetings before civic and business groups, religious organizations, and homeowner associations. Many of the meetings were set in cooperation with the South Miami-Dade Chamber of Commerce. The Chamber made the Busway a major priority in its activities because of the perceived benefits to the business community in South Miami-Dade. The public meetings were held in the last 6 months before the opening of the Busway and during the first 6 months of operation.

There are two sets of printed materials. Individual route guides were developed for the four new routes that were inaugurated when the Busway opened. In addition, a South Miami-Dade Directory was published to look like a telephone directory. The directory provided maps and schedules of all routes in South Miami-Dade, all of which either operated on the Busway or fed passenger traffic to the Busway. A Sunday morning party took place on the Busway the day before the start of revenue service. It was attended by thousands of county residents, and rides on all Busway routes were free for the first two weeks of operation.

#### **FARE STRUCTURE**

Base fares for bus routes operating on the Busway are the same as for other routes in the county (\$1.25 with reduced fares of \$0.60 for elderly, disabled, and youth), and countywide transit passes (\$60 per month) are valid on Busway routes.

To encourage the use of the Busway routes to access Metrorail, the fee that existed for transferring from bus to Metrorail at Dadeland South for inbound passengers (\$0.25 full, \$0.10 reduced) was eliminated. This free transfer linked the Busway to Metrorail in the minds of riders and speeded the boarding of the northbound buses. To further encourage the use of the Busway, the Busway park-and-ride lots did not (and do not) charge for parking.

#### **OPERATING COSTS**

The use of minibuses, at a cost to MDTA of \$31 to \$35 per hour, was significantly less expensive than the \$51 to \$53 per hour cost to operate full-size buses. The

difference in cost reflects lower fuel and maintenance costs and also the lower wages paid to minibus operators under a 1996 agreement between MDTA and transit unions.

### **COMMUNITY CONCERNS**

A group of architects indicated to the state and county that the canopies at the stations could be extended at minimal additional cost to offer better protection from wind-driven rain. These architects also would like each station to have a design unique to the Busway extension.

Homeowners who live adjacent to the Busway objected to the proximity of the Busway. Prior to construction of the Busway there was at least a 100-foot (30-meter) vacant area between homes and US 1. The Busway is only a few feet from bedroom windows. The landscaping was not believed to be sufficient to keep down the noise from the buses; however, tests showed that the noise level of the buses was insignificant to the homes.

Consideration is also being given to extending Metrorail south to 104th Street and building a new intermodal terminal there, where adequate space is available, and congestion is less.

### **BUSWAY EXTENSION**

The Busway is being extended about 11 miles south to the cities of Homestead and Florida City. It will include 12 additional stations, continuation of the South Miami-Dade Trail, a bike path, and planting mature landscaping. Costs are estimated at \$38 million. The extension will be divided into three segments: Northern Segment (5 miles), Central Segment (3.75 miles), and Southern Segment (2.73 miles). The Florida DOT is working on right-of-way acquisition. The MDTA is studying traffic signalization with the County Public Works Department and a consultant is preparing a Project Management Plan. The northern segment construction contract is currently out for bid.

In addition improvements along the existing Busway are being explored. Analysts will study three alternatives for improving Busway speeds and safety across major street intersections focusing first on a single demonstration intersection. This will include the study of three alternatives: elevated structure, depressed by-pass, and at-grade warning devices and signals.

### **ASSESSMENT**

The South Miami-Dade Busway is an exclusive, two-lane, at-grade “feeder” transitway—perhaps the first of its kind in North America. The Busway was built at a relatively low cost, less than \$10 million per mile, in a short time frame. Corridor bus ridership on the Busway is more than 50% higher than before its opening. Improved identity and amenities of the Busway, along with the provision of new services, have contributed to the ridership growth.

The project posed unique challenges to highway traffic engineers and transit planners. The teamwork of these professionals, together with the support of professionals in market research, marketing, and public outreach, has helped make the Busway a success. Metro-Dade Transit cites the following reasons for its success:

1. Transit and highway techniques were applied to complement each other;
2. Transit and intermodal services, facilities, and amenities were built to attract drivers from their automobiles;
3. Market research was employed to identify market demands, and based on this information, unique routes and schedules were developed to meet identified markets; and
4. Marketing techniques were used to let existing and potential riders know about new and revised services and to inform non-riders of the benefits of the project.

#### LESSONS LEARNED

Several lessons emerge from the South Miami-Dade Busway:

1. An at-grade “feeder” busway provides a cost-effective alternative to extending rail transit through low-density areas.
2. A railroad right-of-way provides an opportunity for building a low-cost, minimum-environmental-impact busway. However, where that right-of-way is close to a parallel major roadway, care must be exercised in developing a coordinated system of traffic controls to ensure safety and minimum delay.
3. Where a busway crosses highways, positive traffic protection is essential. If accidents persist, gating of bus crossings may be necessary.
4. To minimize transfers, it is necessary to “overlay” the line-haul busway routes with services to residential areas. However, the overlay service should be limited in scope to maximize clarity of the busway route structure.
5. A fixed-transit facility with frequent service can increase ridership. Even with no travel time advantage, the “presence” or “identity” of the service can enhance ridership.
6. Every effort should be made to obtain rights-of-way as inexpensively and quickly as possible and to avoid alignments that may pose problems or barriers to implementation.
7. A good program of traffic controls, signage, and motorist education is necessary to ensure safe pedestrian crossings of the busway.

8. At-grade busways require close working arrangements between transit planners and traffic engineers in the design and treatments of cross streets and traffic controls.
9. Effective support from state, regional, and local government agencies, as well as the public, is essential. There is need for a sustained public information program throughout project development.

#### APPLICATIONS ELSEWHERE

The use of railroad rights-of-way for busway development—as in South Miami-Dade County—has application elsewhere. The basic design features (two-lane busway with passing capabilities at stations and simple yet attractive, stations) and provisions of ample park-and-ride space can be applied in many communities. Finally, the need for integrated busway and highway traffic controls—and cooperative working arrangements between transit and highway agencies—is essential.



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3. Richmond, Jonathan E.D., New Rail Transit Investments – A Review, Taubamn Center for State and Local Government, John F. Kennedy School of Government, Harvard University, June 29, 1998, p. 65.
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5. Miami-Dade Transit Agency, op. cit., p. 9.

## **ACKNOWLEDGEMENT**

Much of the information in this case study was extracted from a paper (updated) entitled “The South Miami-Dade Busway: A Transit and Highway Joint Project” by David R. Fialkoff, P.E., Chief, Service and Mobility Planning, Miami-Dade Transit Agency, Miami, Florida, USA.

**Table 1: South Miami-Dade Busway Services**

ROUTE	DESCRIPTION	WEEKDAY HEADWAY (MIN)	
		PEAK	OFF PEAK
1	SOUTH MIAMI-DADE GOV'T CENTER DADELAND NORTH METRORAIL	20	40
52	SOUTH MIAMI-DADE HEALTH CENTER CORAL GABLES	NA	NA
38	BUSWAY MAX FLORIDA CITY DADELAND SOUTH	15	30
31	BUSWAY LOCAL CUTLER RIDGE MALL DADELAND SOUTH	15	30
252	CORAL REEF MAX COUNTRY WALK DADELAND SOUTH METRORAIL	20	45
287	SAGA BAY MAX SAGA BAY DADELAND SOUTH	(1) 15	-

**WEEKDAY PEAK PERIODS ONLY**  
**SOURCE: MIAMI-DADE TRANSIT**

**Table 2: Average Boardings Per Day (January – March 2001)**

<b>ROUTE</b>	<b>WEEKDAY</b>	<b>SATURDAY</b>	<b>SUNDAY</b>
STATE-URBAN CORRIDOR FUNDED			
BUSWAY MAX	3,710	3,326	2,776
BUSWAY LOCAL	1,808	1,202	733
CORAL REEF MAX	975	749	478
SAGA BAY MAX	356	0	0
ROUTE 1 BUSWAY	1,424	1,083	513
<b>TOTAL</b>	<b>8,273</b>	<b>6,360</b>	<b>4,500</b>
ROUTE 52 AND OTHER ROUTES	3,921	3,051	
SERVING CORRIDOR	12,194	13,911	
% INCREASE FROM 1996	<b>+68%</b>	<b>+125%</b>	

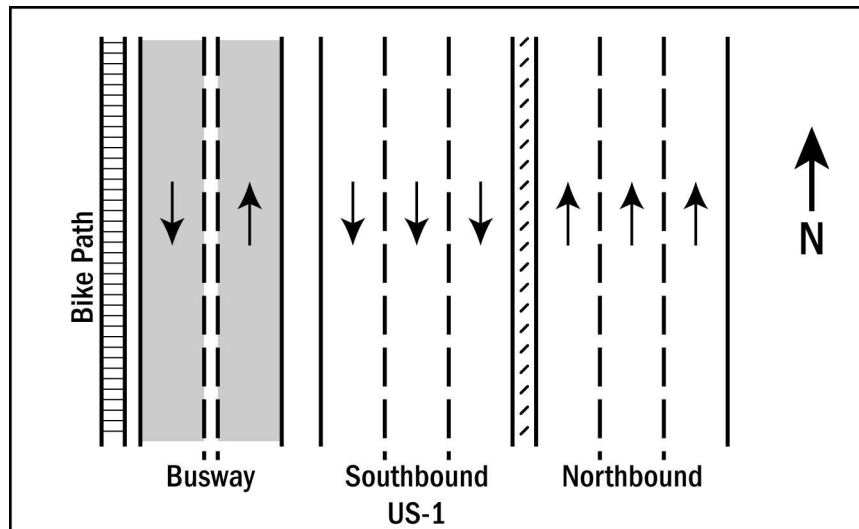
Source: Miami-Dade Transit Project Status/Progress Report, January 1 – March 13, 2001

# South Miami-Dade Busway

This map illustrates the South Miami-Dade Busway system, which runs from Kendall in the north to Florida City in the south. The busway is shown as a thick grey line with various stations and landmarks marked along its route. Key features include:

- Stations and Landmarks:** MDCC Kendall Campus, Killian Dr, SW 117 Ave, SW 112 St, SW 117 St, SW 124 St, SW 128 St, SW 136 St, SW 144 St, SW 152 St, SW 160 St, SW 168 St, SW 173 St, SW 184 St, SW 200 St, SW 216 St, SW 220 St, SW 268 St, SW 280 St, Homestead Air Reser ve Sta tion, Mowry Dr, West Palm Dr, Florida City, South Dade Govt Ctr., Health Center, Old Cutler Rd, 102 Ave, 112 Ave, 127 Ave, 132 Ave, 142 Ave, 157 Ave, 177 Ave, 187 Ave, 197 Ave, 207 Ave, 217 Ave, 227 Ave, 237 Ave, 247 Ave, 257 Ave, 267 Ave, 277 Ave, 287 Ave, 297 Ave, 307 Ave, 317 Ave, 327 Ave, 337 Ave, 347 Ave, 357 Ave, 367 Ave, 377 Ave, 387 Ave, 397 Ave, 407 Ave, 417 Ave, 427 Ave, 437 Ave, 447 Ave, 457 Ave, 467 Ave, 477 Ave, 487 Ave, 497 Ave, 507 Ave, 517 Ave, 527 Ave, 537 Ave, 547 Ave, 557 Ave, 567 Ave, 577 Ave, 587 Ave, 597 Ave, 607 Ave, 617 Ave, 627 Ave, 637 Ave, 647 Ave, 657 Ave, 667 Ave, 677 Ave, 687 Ave, 697 Ave, 707 Ave, 717 Ave, 727 Ave, 737 Ave, 747 Ave, 757 Ave, 767 Ave, 777 Ave, 787 Ave, 797 Ave, 807 Ave, 817 Ave, 827 Ave, 837 Ave, 847 Ave, 857 Ave, 867 Ave, 877 Ave, 887 Ave, 897 Ave, 907 Ave, 917 Ave, 927 Ave, 937 Ave, 947 Ave, 957 Ave, 967 Ave, 977 Ave, 987 Ave, 997 Ave, 1007 Ave, 1017 Ave, 1027 Ave, 1037 Ave, 1047 Ave, 1057 Ave, 1067 Ave, 1077 Ave, 1087 Ave, 1097 Ave, 1107 Ave, 1117 Ave, 1127 Ave, 1137 Ave, 1147 Ave, 1157 Ave, 1167 Ave, 1177 Ave, 1187 Ave, 1197 Ave, 1207 Ave, 1217 Ave, 1227 Ave, 1237 Ave, 1247 Ave, 1257 Ave, 1267 Ave, 1277 Ave, 1287 Ave, 1297 Ave, 1307 Ave, 1317 Ave, 1327 Ave, 1337 Ave, 1347 Ave, 1357 Ave, 1367 Ave, 1377 Ave, 1387 Ave, 1397 Ave, 1407 Ave, 1417 Ave, 1427 Ave, 1437 Ave, 1447 Ave, 1457 Ave, 1467 Ave, 1477 Ave, 1487 Ave, 1497 Ave, 1507 Ave, 1517 Ave, 1527 Ave, 1537 Ave, 1547 Ave, 1557 Ave, 1567 Ave, 1577 Ave, 1587 Ave, 1597 Ave, 1607 Ave, 1617 Ave, 1627 Ave, 1637 Ave, 1647 Ave, 1657 Ave, 1667 Ave, 1677 Ave, 1687 Ave, 1697 Ave, 1707 Ave, 1717 Ave, 1727 Ave, 1737 Ave, 1747 Ave, 1757 Ave, 1767 Ave, 1777 Ave, 1787 Ave, 1797 Ave, 1807 Ave, 1817 Ave, 1827 Ave, 1837 Ave, 1847 Ave, 1857 Ave, 1867 Ave, 1877 Ave, 1887 Ave, 1897 Ave, 1907 Ave, 1917 Ave, 1927 Ave, 1937 Ave, 1947 Ave, 1957 Ave, 1967 Ave, 1977 Ave, 1987 Ave, 1997 Ave, 2007 Ave, 2017 Ave, 2027 Ave, 2037 Ave, 2047 Ave, 2057 Ave, 2067 Ave, 2077 Ave, 2087 Ave, 2097 Ave, 2107 Ave, 2117 Ave, 2127 Ave, 2137 Ave, 2147 Ave, 2157 Ave, 2167 Ave, 2177 Ave, 2187 Ave, 2197 Ave, 2207 Ave, 2217 Ave, 2227 Ave, 2237 Ave, 2247 Ave, 2257 Ave, 2267 Ave, 2277 Ave, 2287 Ave, 2297 Ave, 2307 Ave, 2317 Ave, 2327 Ave, 2337 Ave, 2347 Ave, 2357 Ave, 2367 Ave, 2377 Ave, 2387 Ave, 2397 Ave, 2407 Ave, 2417 Ave, 2427 Ave, 2437 Ave, 2447 Ave, 2457 Ave, 2467 Ave, 2477 Ave, 2487 Ave, 2497 Ave, 2507 Ave, 2517 Ave, 2527 Ave, 2537 Ave, 2547 Ave, 2557 Ave, 2567 Ave, 2577 Ave, 2587 Ave, 2597 Ave, 2607 Ave, 2617 Ave, 2627 Ave, 2637 Ave, 2647 Ave, 2657 Ave, 2667 Ave, 2677 Ave, 2687 Ave, 2697 Ave, 2707 Ave, 2717 Ave, 2727 Ave, 2737 Ave, 2747 Ave, 2757 Ave, 2767 Ave, 2777 Ave, 2787 Ave, 2797 Ave, 2807 Ave, 2817 Ave, 2827 Ave, 2837 Ave, 2847 Ave, 2857 Ave, 2867 Ave, 2877 Ave, 2887 Ave, 2897 Ave, 2907 Ave, 2917 Ave, 2927 Ave, 2937 Ave, 2947 Ave, 2957 Ave, 2967 Ave, 2977 Ave, 2987 Ave, 2997 Ave, 3007 Ave, 3017 Ave, 3027 Ave, 3037 Ave, 3047 Ave, 3057 Ave, 3067 Ave, 3077 Ave, 3087 Ave, 3097 Ave, 3107 Ave, 3117 Ave, 3127 Ave, 3137 Ave, 3147 Ave, 3157 Ave, 3167 Ave, 3177 Ave, 3187 Ave, 3197 Ave, 3207 Ave, 3217 Ave, 3227 Ave, 3237 Ave, 3247 Ave, 3257 Ave, 3267 Ave, 3277 Ave, 3287 Ave, 3297 Ave, 3307 Ave, 3317 Ave, 3327 Ave, 3337 Ave, 3347 Ave, 3357 Ave, 3367 Ave, 3377 Ave, 3387 Ave, 3397 Ave, 3407 Ave, 3417 Ave, 3427 Ave, 3437 Ave, 3447 Ave, 3457 Ave, 3467 Ave, 3477 Ave, 3487 Ave, 3497 Ave, 3507 Ave, 3517 Ave, 3527 Ave, 3537 Ave, 3547 Ave, 3557 Ave, 3567 Ave, 3577 Ave, 3587 Ave, 3597 Ave, 3607 Ave, 3617 Ave, 3627 Ave, 3637 Ave, 3647 Ave, 3657 Ave, 3667 Ave, 3677 Ave, 3687 Ave, 3697 Ave, 3707 Ave, 3717 Ave, 3727 Ave, 3737 Ave, 3747 Ave, 3757 Ave, 3767 Ave, 3777 Ave, 3787 Ave, 3797 Ave, 3807 Ave, 3817 Ave, 3827 Ave, 3837 Ave, 3847 Ave, 3857 Ave, 3867 Ave, 3877 Ave, 3887 Ave, 3897 Ave, 3907 Ave, 3917 Ave, 3927 Ave, 3937 Ave, 3947 Ave, 3957 Ave, 3967 Ave, 3977 Ave, 3987 Ave, 3997 Ave, 4007 Ave, 4017 Ave, 4027 Ave, 4037 Ave, 4047 Ave, 4057 Ave, 4067 Ave, 4077 Ave, 4087 Ave, 4097 Ave, 4107 Ave, 4117 Ave, 4127 Ave, 4137 Ave, 4147 Ave, 4157 Ave, 4167 Ave, 4177 Ave, 4187 Ave, 4197 Ave, 4207 Ave, 4217 Ave, 4227 Ave, 4237 Ave, 4247 Ave, 4257 Ave, 4267 Ave, 4277 Ave, 4287 Ave, 4297 Ave, 4307 Ave, 4317 Ave, 4327 Ave, 4337 Ave, 4347 Ave, 4357 Ave, 4367 Ave, 4377 Ave, 4387 Ave, 4397 Ave, 4407 Ave, 4417 Ave, 4427 Ave, 4437 Ave, 4447 Ave, 4457 Ave, 4467 Ave, 4477 Ave, 4487 Ave, 4497 Ave, 4507 Ave, 4517 Ave, 4527 Ave, 4537 Ave, 4547 Ave, 4557 Ave, 4567 Ave, 4577 Ave, 4587 Ave, 4597 Ave, 4607 Ave, 4617 Ave, 4627 Ave, 4637 Ave, 4647 Ave, 4657 Ave, 4667 Ave, 4677 Ave, 4687 Ave, 4697 Ave, 4707 Ave, 4717 Ave, 4727 Ave, 4737 Ave, 4747 Ave, 4757 Ave, 4767 Ave, 4777 Ave, 4787 Ave, 4797 Ave, 4807 Ave, 4817 Ave, 4827 Ave, 4837 Ave, 4847 Ave, 4857 Ave, 4867 Ave, 4877 Ave, 4887 Ave, 4897 Ave, 4907 Ave, 4917 Ave, 4927 Ave, 4937 Ave, 4947 Ave, 4957 Ave, 4967 Ave, 4977 Ave, 4987 Ave, 4997 Ave, 5007 Ave, 5017 Ave, 5027 Ave, 5037 Ave, 5047 Ave, 5057 Ave, 5067 Ave, 5077 Ave, 5087 Ave, 5097 Ave, 5107 Ave, 5117 Ave, 5127 Ave, 5137 Ave, 5147 Ave, 5157 Ave, 5167 Ave, 5177 Ave, 5187 Ave, 5197 Ave, 5207 Ave, 5217 Ave, 5227 Ave, 5237 Ave, 5247 Ave, 5257 Ave, 5267 Ave, 5277 Ave, 5287 Ave, 5297 Ave, 5307 Ave, 5317 Ave, 5327 Ave, 5337 Ave, 5347 Ave, 5357 Ave, 5367 Ave, 5377 Ave, 5387 Ave, 5397 Ave, 5407 Ave, 5417 Ave, 5427 Ave, 5437 Ave, 5447 Ave, 5457 Ave, 5467 Ave, 5477 Ave, 5487 Ave, 5497 Ave, 5507 Ave, 5517 Ave, 5527 Ave, 5537 Ave, 5547 Ave, 5557 Ave, 5567 Ave, 5577 Ave, 5587 Ave, 5597 Ave, 5607 Ave, 5617 Ave, 5627 Ave, 5637 Ave, 5647 Ave, 5657 Ave, 5667 Ave, 5677 Ave, 5687 Ave, 5697 Ave, 5707

### Figure 1: South Miami-Dade Busway Map



**South Miami-Dade Busway Configuration**  
**Figure 2: South Miami-Dade Busway Configuration**



**Figure 3: Typical South Miami-Dade Busway Cross Section**



**Figure 4: South Miami-Dade Busway in Dadeland South Vicinity**



**Figure 5: Typical South Miami-Dade Busway Station**



**Figure 6: Route Signage at Busway Stations**



# Busway Local

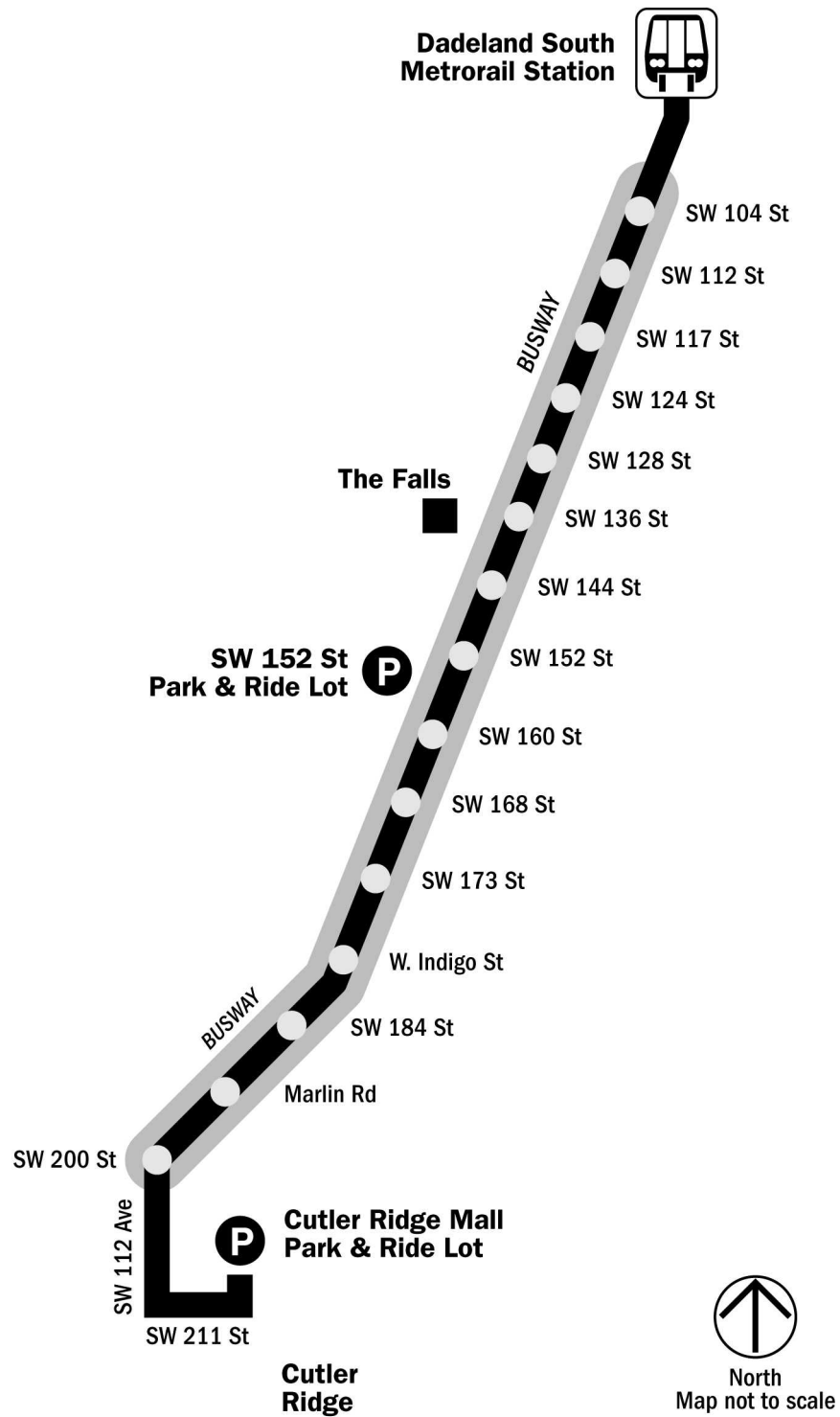
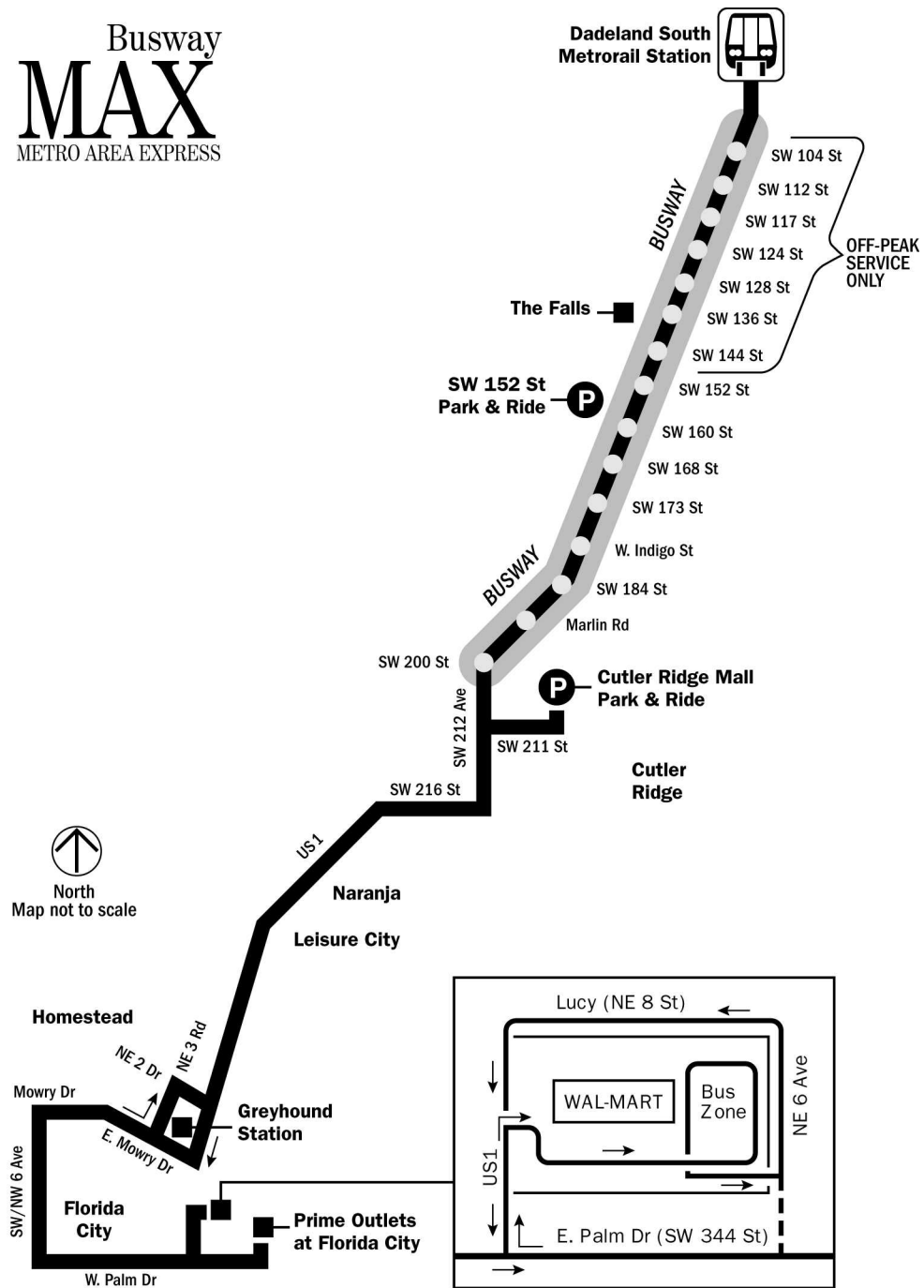


Figure 7: Busway Local (Between Cutler Ridge and Dadeland South Metro)

Busway  
**MAX**  
METRO AREA EXPRESS



**Figure 8: Busway MAX (Between Florida City and Dadeland South Metro)**

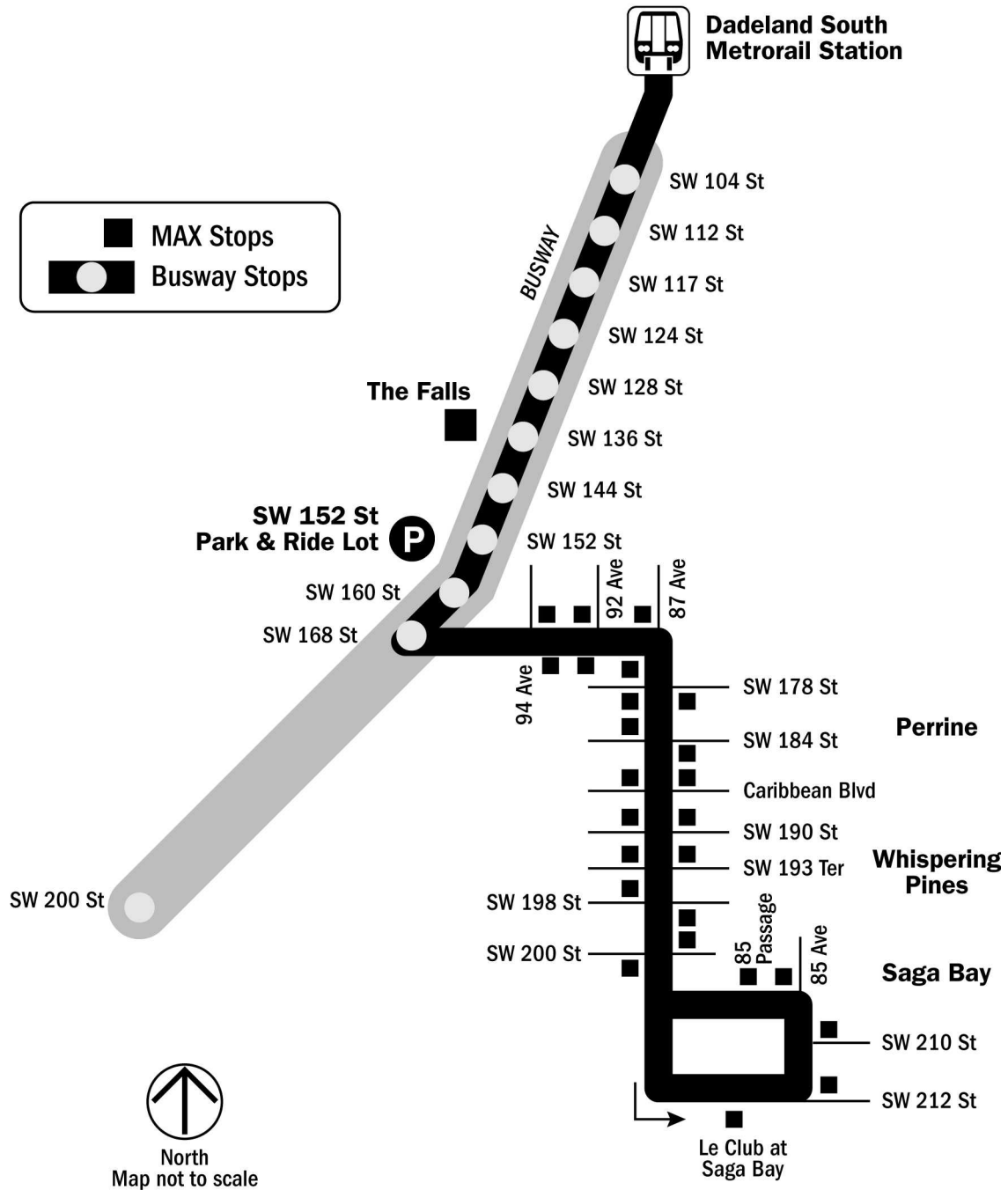
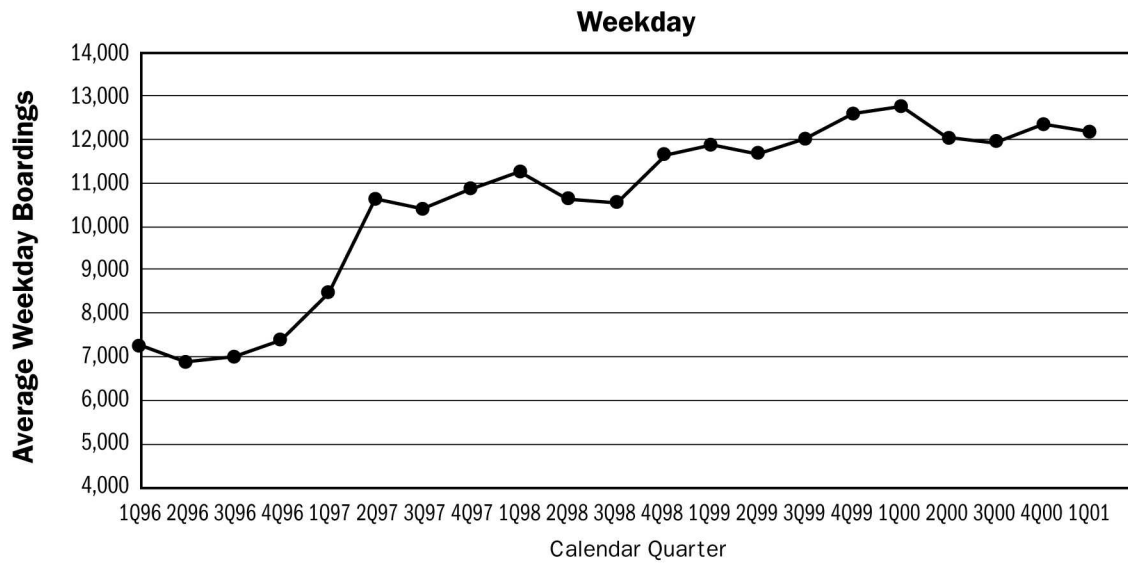
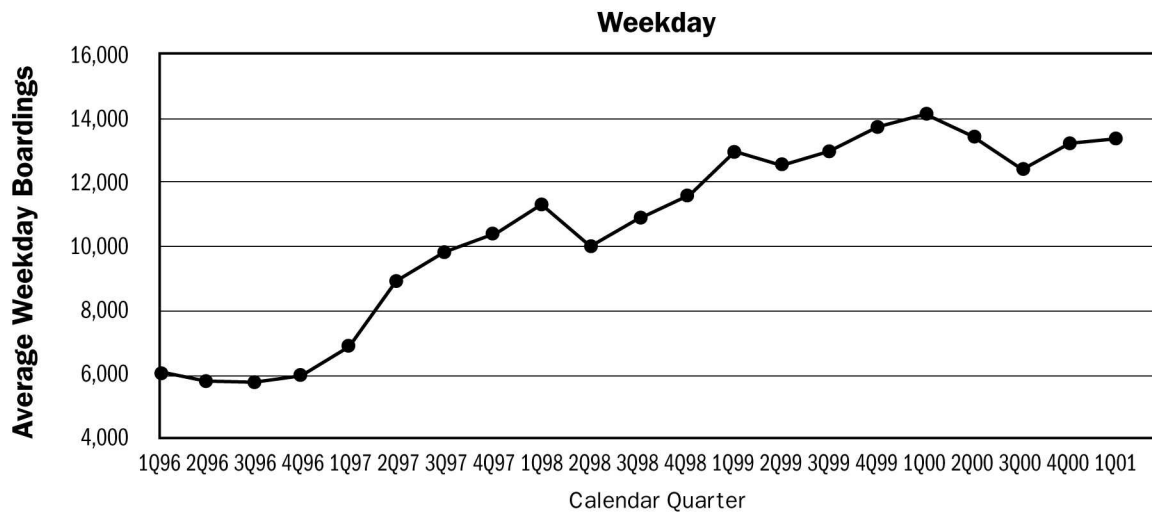


Figure 9: Saga Bay MAX (from Saga Bay to Dadeland South Metro)



NOTE: Busway service began February 1997



**Figure 10: Ridership Growth Graph**



**Figure 11: Photograph of Miami-Dade Transit Minibus**



**Figure 12: Photograph of Miami-Dade Transit Full-Size, Articulated Bus**