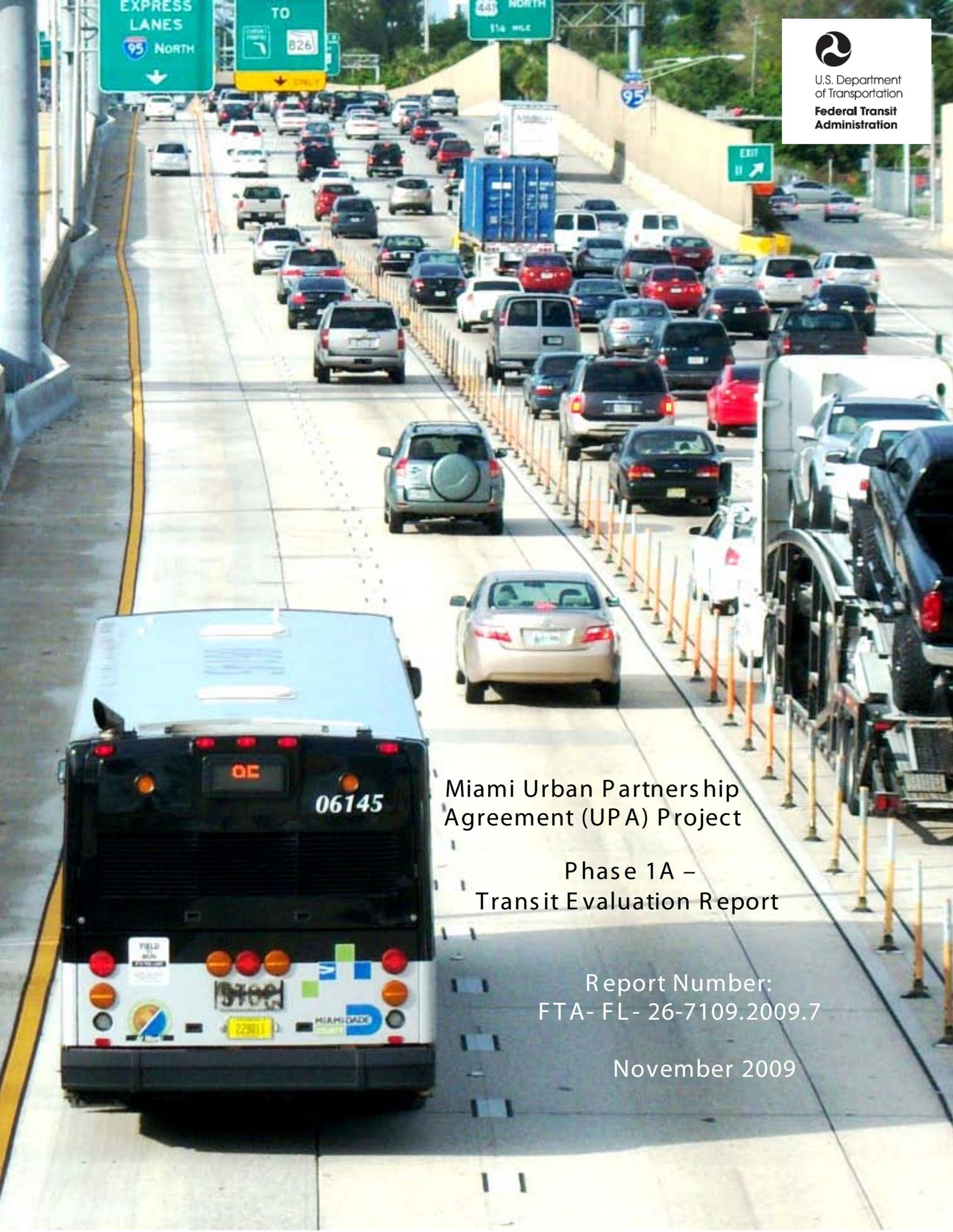




U.S. Department of  
Transportation  
**Federal Transit  
Administration**



Miami Urban Partnership  
Agreement (UPA) Project

Phase 1A –  
Transit Evaluation Report

Report Number:  
FTA- FL- 26-7109.2009.7

November 2009

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# Miami Urban Partnership Agreement (UPA) Project

## Phase 1A - Transit Evaluation

Funded by the Federal Transit Administration



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**November 2009**

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## Executive Summary

Miami is one of the United States Department of Transportation (USDOT)'s Urban Partnership Agreement (UPA) program sites. This federally funded project is being implemented by the Florida Department of Transportation (FDOT), supported by Florida's Turnpike Enterprise, Miami Dade Transit (MDT), Broward County Transit (BCT), and South Florida Commuter Services, to alleviate traffic congestion on the I-95 corridor between I-595 in Broward County and I-395 in Miami-Dade County. The project involves replacing the existing High Occupancy Vehicle (HOV) lanes with '95 Express Lanes' which are based on the High Occupancy Toll (HOT) concept, supported by transit and Travel Demand Management enhancements. Phase 1A was implemented in December 2008 providing new '95 Express Lanes' on the northbound direction of I-95 between downtown Miami and Golden Glades Interchange. Southbound Express Lanes on this section will open in early 2010 (Phase 1B). Phase II, from Golden Glades to I-595, is scheduled to open in 2011. This report presents the results of the transit evaluation for Phase 1A.

The National Bus Rapid Transit Institute (NBRTI) is responsible for the evaluation of the transit elements of the Miami UPA project, addressing the following questions/hypotheses identified in the National Evaluation Framework:

- (i) The UPA project will enhance transit performance (through reduced travel times, increased reliability, increased capacity, etc.)
- (ii) The UPA project will increase ridership and facilitate a mode shift to transit.
- (iii) Mode shift to transit/increased ridership will contribute to congestion mitigation.
- (iv) What was the contribution of each UPA project element to increased ridership and/or mode shift to transit?

The first hypothesis, which relates to the impacts of the UPA project on **transit performance**, is discussed in Chapter 5 of this report. The second hypothesis, which documents the impacts of any changes in transit performance on **service usage**, is considered in Chapter 6. The third and fourth hypotheses, which relate to the **impacts of transit on congestion**, require input for other areas of the evaluation and will be discussed in the Conclusions section (Chapter 7).

### Transit Service Performance Impacts

Express Lanes (Miami Phase 1A) implementation has had a significant impact on the northbound travel times of 95 Express bus routes between downtown Miami and Golden Glades Interchange, with travel times on this 7.5 mile section decreasing from 25 minutes to 8 minutes on average. This has allowed Miami-Dade Transit to decrease scheduled northbound travel times from downtown Miami to Golden Glades Interchange from 32 to 22 minutes, now 10 minutes quicker than before and 10 minutes quicker than in the opposite direction. Service reliability, measured in terms of on-time performance, has remained unchanged although it was not possible to isolate the northbound direction only in the calculation of this metric. Service quantity on the 95 Express service, measured in terms of revenue miles, has decreased slightly by 7.0 percent while corridor bus service quantity decreased by 4.2 percent, the result of systemwide service cuts due to budget constraints. Parking capacity at Golden Glades Interchange has been fully utilized since summer 2008.

## **Transit Service Usage Impacts**

Bi-directional ridership on the 95 Express bus service increased by 30 percent when comparing the first three months of 2009 with the same period of the previous year, with a significant increase coinciding with Express Lanes implementation in December 2008. This represents a significant increase in productivity of 40 percent, measured in terms of boardings per revenue mile. At the corridor level however, bus ridership actually dropped by 4.6 percent, with corridor level boardings per revenue mile remaining unchanged. This is likely due to small systemwide reductions in service quantity and significant fare increases, coupled with exogenous factors like lower gas prices and economic recession, plus the fact that the 95 Express accounts for less than one fifth of total corridor ridership. The higher income profile of express bus users is one reason why the fare increase has not impacted 95 Express ridership in the same way in which it has impacted the MDT system as a whole.

Data from FDOT's I-95 Lane Monitoring Reports were used to assess the impacts of Express Lanes implementation on transit person throughput and mode share. Transit person throughput was measured at 1.4 percent higher in 2009 compared to 2008. While the sampled transit person throughput remained approximately the same, SOV person throughput increased dramatically due to SOVs being permitted to legally use the managed lanes. The net effect of this was that transit mode share in the managed lanes decreased from 15 percent in 2008 to 12.3 percent in 2009, while transit mode share for the facility as a whole remained unchanged at around 3.5 percent. Mode shift to transit may be constrained by the lack of parking capacity at Golden Glades Interchange.

## **Transit User Perceptions**

Though the 95 Express bus service is already highly rated, Express Lanes implementation has further improved customer satisfaction, with statistically significant increases in perceptions of travel time and service reliability (as well as seat availability). The only element receiving a lower rating in 2009 was "value for money of service", though the rating difference was not statistically significant. This lower rating likely relates to the significant increase in fare and pass costs imposed in October 2008.

Several questions were included in the 2009 survey to assess potential mode shift resulting from Express Lanes implementation. It was found that almost all surveyed users (92%) had been riding the service before the Express Lanes were implemented, suggesting negligible mode shift due to Express Lanes. However, 50 percent of the total sample stated that their prior mode for the trip was travelling alone by car, which suggests that the 95 Express bus service in general has had some success over time in attracting private auto users. The rate at which private auto users have been attracted to the 95 Express service has remained relatively unchanged over time, providing further evidence that mode shift to transit due to Express Lanes has been negligible. It was also observed that only 4.2 percent of all surveyed users indicated that they previously carpooled in the HOV lanes, with no prior carpoolers among those that began using the service after Express Lanes implementation. This indicates that current 95 Express users are generally not prior carpoolers, and that changing the eligibility requirement to use the Express Lanes from unregistered 2+ to registered 3+ has not induced prior carpoolers to switch to transit.

## **Context of Phase 1A Transit Impacts**

Overall this analysis has shown that Express Lanes implementation has had a positive impact on the transit services that use I-95, significantly improving northbound travel times between downtown Miami and Golden Glades Interchange, as well as improving user perceptions of an already highly rated service. While these improvements in performance appear to have induced a significant increase in ridership on the transit services using I-95, this has not translated into corridor level ridership gains. This is likely due to systemwide service cuts and fare increases, coupled with exogenous factors like low gasoline prices and economic recession, plus the fact that the 95 Express accounts for less than one fifth of total corridor ridership. Within this context, the ridership gains observed on the 95 Express bus service are even more impressive, though transit mode share on the Express Lanes has actually reduced slightly due to a significant increase in the number of SOVs on the facility. Finally, it should be noted that most 95 Express users are commuters on daily round trips, and as such still have to endure high levels of traffic congestion in the southbound direction. Thus, the competitiveness of the 95 Express bus service as a round trip commute mode versus the private auto cannot be fully realized until the southbound direction is similarly improved under Phase 1B of the project.

## **National Evaluation Hypotheses**

The table on the next page summarizes the main conclusions of this report and relates them to the overarching hypotheses posed in the National Evaluation Framework document.

## Conclusions Summary in Relation to NEF Hypotheses/Questions

Hypothesis/ Question	Measures of Effectiveness	Conclusion
<p>The UPA project will enhance transit performance in the UPA/CRD corridors (through reduced travel times, increased reliability, increased capacity, etc.)</p>	<ul style="list-style-type: none"> <li>– Travel times have decreased significantly from 25 mins in 2008 to 8 mins in 2009 on the northbound Express Lanes between downtown Miami and Golden Glades Interchange</li> <li>– Two-way reliability levels (measured in terms of on-time performance) have remained unchanged</li> <li>– Statistically significant improvements were observed in transit user perceptions of travel time and reliability</li> <li>– Transit service quantity (revenue miles) for the 95X decreased by 7% and corridor bus service quantity decreased by 4.2%</li> <li>– Parking capacity at Golden Glades Interchange is fully utilized</li> </ul>	<ul style="list-style-type: none"> <li>– The Express Lanes have significantly decreased northbound transit travel times between downtown Miami and Golden Glades Interchange</li> <li>– Customer perceptions of travel time and reliability on this section of I-95 have improved significantly.</li> <li>– Parking capacity constraints at Golden Glades Interchange is likely to be restricting potential growth in corridor ridership</li> </ul>
<p>The UPA project will increase ridership and facilitate a mode shift to transit.</p>	<ul style="list-style-type: none"> <li>– 95X ridership has increased by 30%</li> <li>– Corridor bus ridership decreased by 4.6%</li> <li>– Systemwide MDT ridership decreased by 5%</li> <li>– Boardings per revenue mile on the 95X have increased by 40% showing a significant increase in productivity</li> <li>– Net corridor boardings per revenue mile have remained constant</li> <li>– Average vehicle occupancies on the Express Lanes and on the facility as a whole have decreased due to significant increases in SOV volumes</li> <li>– Transit mode share within the managed lanes decreased from 15% to 12.3% between 2008 and 2009</li> <li>– Transit mode share for the whole facility has remained relatively consistent (3.6% in 2008 and 3.5% in 2009)</li> </ul>	<ul style="list-style-type: none"> <li>– 95X ridership has increased significantly due to Express Lanes, but this has not impacted corridor level ridership, which has decreased slightly due to exogenous factors coupled with a slight reduction in corridor service quantity and a significant increase in fares</li> <li>– Express Lanes introduction has slightly decreased transit mode share within the Express Lanes due to the significant increase in SOVs within these lanes</li> <li>– Facility level transit mode share has remained unaffected by opening of Express Lanes</li> </ul>
<p>Mode shift to transit / increased ridership will contribute to congestion mitigation</p>	<ul style="list-style-type: none"> <li>– Transit mode share for the whole facility has remained relatively consistent (3.6% in 2008 and 3.5% in 2009)</li> <li>– Express Lanes have reduced traffic congestion between SR 112 and NW 125<sup>th</sup> St, with PM Peak LOS improving from LOS F in 2008 to LOS C in 2009*.</li> </ul>	<ul style="list-style-type: none"> <li>– While traffic congestion has been reduced, transit mode share has not changed and therefore transit has not contributed to the observed reduction in traffic congestion</li> </ul>
<p>What was the contribution of each UPA project element to increased ridership and/or mode shift to transit?</p>	<ul style="list-style-type: none"> <li>– Travel times have decreased significantly from 25 mins in 2008 to 8 mins in 2009</li> <li>– 95X ridership has increased by 30%</li> <li>– Transit mode share for the whole facility has remained relatively consistent (3.6% in 2008 and 3.5% in 2009)</li> </ul>	<ul style="list-style-type: none"> <li>– Improved travel times on the northbound Express Lanes have resulted in significant increases in route level ridership, but this has not impacted transit mode share.</li> </ul>

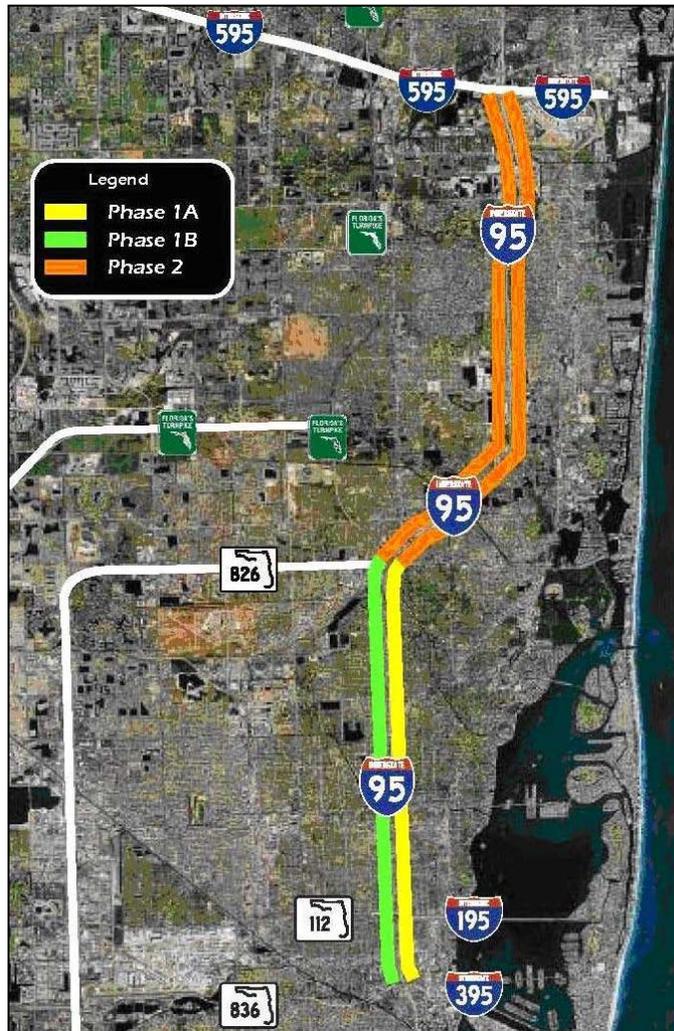
\* Florida Department of Transportation. (2009). *95 Express Managed Lanes Monitoring Report – Phase 1A*. Kimley-Horn & Associates.

# 1 Introduction

## 1.1 Background

Miami is one of the United States Department Of Transportation (USDOT)'s Urban Partnership Agreement (UPA) program sites. This federally funded project is being implemented by the Florida Department of Transportation (FDOT), supported by Florida's Turnpike Enterprise, Miami Dade County Transit, Broward County Transit, and South Florida Commuter Services, to alleviate traffic congestion on the I-95 corridor between I-595 in Broward County and I-395 in Miami-Dade County.

As shown in Figure 1, the project involves replacing the existing High Occupancy Vehicle (HOV) lanes with '95 Express Lanes' which are based on the High Occupancy Toll (HOT) concept. Phase 1A was implemented in December 2008 providing new '95 Express Lanes' on the northbound direction of I-95 between downtown Miami and Golden Glades Interchange. Southbound Express Lanes on this section are expected to be added in early 2010 (Phase 1B), with Phase II, from Golden Glades to I-595, scheduled to open in 2012.



**Figure 1 – The Miami UPA Project**

Source: Briefing of 95 Express Progress NTOC, FDOT, 2009.

Various transit measures are also planned to support the 95 Express Lanes project by providing high-quality BRT service and infrastructure to, from, and on the I-95 corridor.

- **Miami-Dade Transit Express bus service.** Current and new express bus/BRT service within the portions of the newly-converted I-95 HOT lanes that extend between downtown Miami, the Golden Glades Interchange and destinations north along I-95 to Broward Boulevard. These transit services will be operated by Miami-Dade Transit.
- **Broward County Express bus service.** Express bus routes north-south along US 441/SR 7 and SR 817 and east-west on Hollywood/Pines Boulevard. These new services will serve as a possible one-seat ride between Broward County and downtown Miami and act as feeder services to the Golden Glades Interchange. These transit services will be operated by Broward County Transit.

- **Transit facility improvements.**

- Transit Signal Priority (TSP) at 50 intersections to facilitate the movement of transit vehicles along US 441/SR 7 and SR 871.
- Platforms, ramps, and shelters with access for persons with disabilities to the I-95/Broward Boulevard park-n-ride lot.
- Uniquely branded stations for the new express services and pedestrian facilities.

While MDT will continue to operate express bus service on the I-95 corridor, and even add additional service during Phase 1A, most of these improvements are scheduled for implementation during Phase 1B and Phase 2.

## 1.2 Evaluation Roles and Responsibilities

The National Bus Rapid Transit Institute (NBRTI) is responsible for the evaluation of the transit elements of the Miami UPA project, with FDOT responsible for the other aspects of the evaluation. General NBRTI responsibilities are defined as follows:

- a) Provide technical assistance to Miami UPA local partners by providing input on the development of, and reviewing and commenting on, evaluation materials, such as the evaluation plan, test plans, and surveys as applicable.
- b) Analyze data collected by local partners.
- c) Develop and submit transit evaluation reports to the Federal Transit Administration (FTA) and National UPA Evaluator (Battelle Memorial Institute), and to assist FDOT with the transit-related sections of their evaluation reports.

FDOT has produced an overarching Phase 1A report titled *“95 Express Mid-Year Report. Project Status for Urban Partnership Agreement”*. This report includes a section on transit impacts which summarizes the main findings of this transit evaluation report.

## 1.3 Transit Evaluation Objectives

A Transit Evaluation Plan was developed for FTA to guide the transit evaluation process. A summary of this is provided as a matrix in Appendix I<sup>1</sup>. The plan aims to address the four basic objectives identified in the National Evaluation Framework document developed by the National Evaluation team led by the Battelle Memorial Institute. This document identifies the following core questions/hypotheses to be addressed in the Transit Analysis section:

- (i) The UPA project will enhance transit performance (through reduced travel times, increased reliability, increased capacity, etc.)
- (ii) The UPA project will increase ridership and facilitate a mode shift to transit.
- (iii) Mode shift to transit/increased ridership will contribute to congestion mitigation.
- (iv) What was the contribution of each UPA project element to increased ridership and/or mode shift to transit?

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<sup>1</sup> Some indicators shown in the Transit Evaluation Matrix have not been assessed within this report:

- Operating cost/farebox data are not available at the corridor level
- Safety data are not available at the corridor level
- ADA Compliance has not been assessed due to no infrastructure changes related to the project

The first hypothesis, which relates to the impacts of the UPA project on **transit performance**, is discussed in Chapter 5 of this report. The second hypothesis, which documents the impacts of any changes in transit performance on **service usage**, is considered in Chapter 6. The third and fourth hypotheses, which relate to the **impacts of transit on traffic congestion**, due to increased ridership and/or transit mode shift, require input from other areas of the evaluation and will be discussed in the Conclusions section (Chapter 7).

## 1.4 Terminology

Various terms are used interchangeably in the report in reference to the northbound High Occupancy Toll (HOT) lanes. The locally defined “Express Lanes” term is used in most cases, though the term “managed lanes” is sometimes used due to this term being adopted by other reports and datasets referenced in this study. The more generic “managed lanes” term is also used when comparing the prior High Occupancy Vehicle (HOV) lane with the new Express Lanes.

## 2 Project Description

### 2.1 95 Express Lanes – Phase 1A

On December 5, 2008 the 95 Express Lanes opened in the northbound direction between downtown Miami and the Golden Glades Interchange. This meant the replacement of the existing northbound HOV lane (one lane in each direction) with two HOT lanes. The additional space required for the extra lane was obtained by narrowing the width of the existing lanes from 12 feet to 11 feet and by narrowing the width of the shoulder lane.

Eligibility requirements to travel free in the Express Lanes were changed from unregistered two or more persons per vehicle (2+) to registered carpools and vanpools of three or more persons (3+, in addition to other requirements based on the home and work location of each registrant), plus hybrid vehicles. Motorcycles and emergency vehicles are permitted to use the lanes for free without registering, as are public transit vehicles, school buses, and other over-the-road coaches.

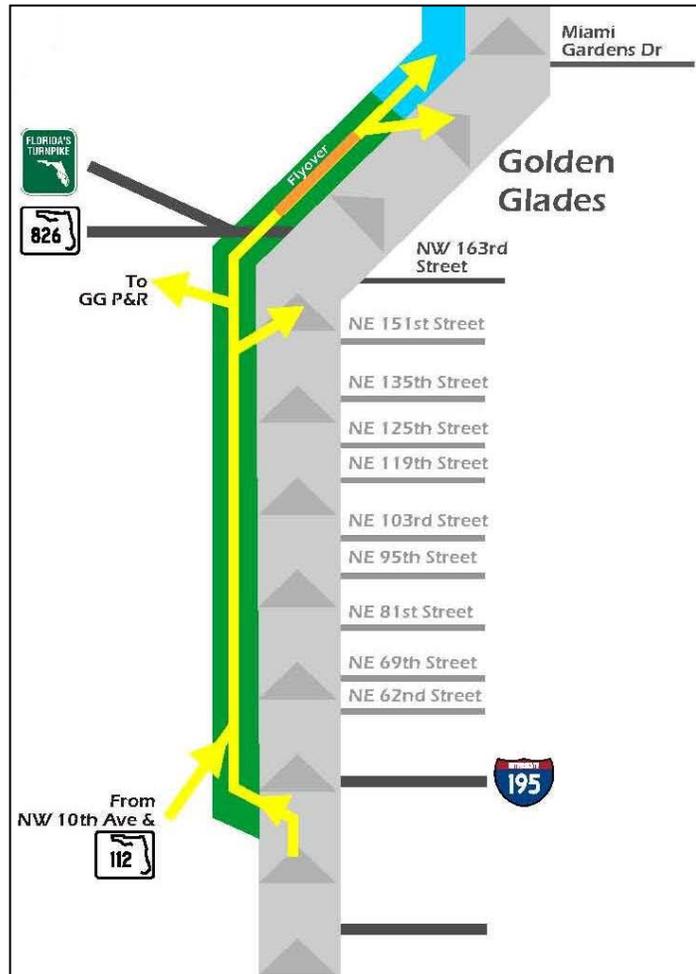


Figure 2 - 95 Express Lanes - Phase 1A

Source: FDOT. [www.95express.com](http://www.95express.com)

Unregistered vehicles participating in the SunPass prepaid toll program are permitted to travel in the Express Lanes for a fee that ranges from \$0.25 to \$6.25 in order to ensure average speeds of 45mph or above in the Express Lanes. Access to the lanes has been restricted to specific entry and exit points using closely spaced delineator poles, where previously vehicles could merge in and out of the HOV lanes at will.

### 2.2 The 95 Express Bus Transit Service

Transit service on I-95 between downtown Miami and Golden Glades Interchange is operated by Miami-Dade Transit (MDT), branded as the I-95 Express bus or 95 Express (95X). This express service connects several locations in northern Miami-Dade County with various locations in downtown Miami.

Each variant serves different locations at either end of the route, with I-95 between downtown Miami and the Golden Glades interchange acting as the central trunk section of each route. The routes are designed primarily to connect commuters with employment sites in downtown Miami. The service operates on weekdays only from 5:30 am to 10:15 am and 2:30 pm to 6:30 pm in the southbound direction and 6:00 am to 10:30 am and 2.45 pm to 8:00 pm in the northbound direction. During peak periods (7:00 am to 9:00 am, southbound; 4:00 pm to 6:00 pm, northbound), the service operates at three to five minute headways on the I-95 trunk section. Outside these peak periods, and outside the I-95 trunk section of the route, services run at lower frequencies of 15 to 30 minutes. Since December 2008, the 95 Express bus services use the Express Lanes in the northbound direction and the pre-existing HOV lane in the southbound direction.

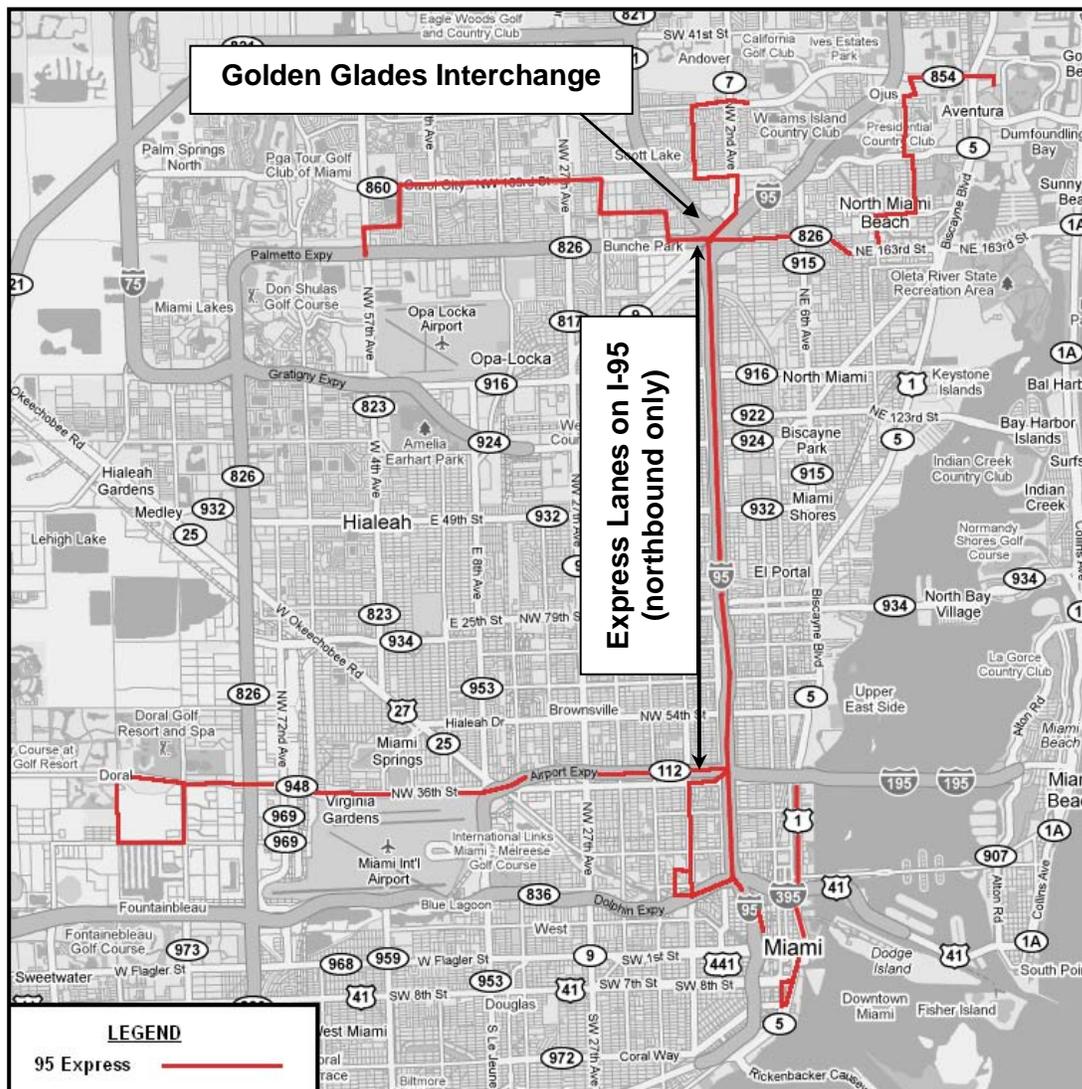


Figure 3 - 95 Express Bus Route Alignments and the Location of Express Lanes Phase 1A

### **3 Methodology**

#### **3.1 Definition of Pre and Post Deployment Evaluation Periods**

The general approach used in this evaluation is a before-after comparison. Ideally, this would encompass at least one year of baseline “before” data and one year of post-deployment “after” data. However, given the reporting timelines and the time constraints on data availability, a baseline period of January to March 2008 and post-deployment period of January to March 2009 was defined. This allowed the same three months of the calendar year to be evaluated pre-and post deployment, removing the potential for any bias due to seasonal factors. While these two three-month periods are the focus of the pre and post deployment comparisons, the entire period between January 2008 and March 2009 are presented where possible to show the overall trends over this 15 month period.

Transit mode share and transit travel time impacts were considered using data from FDOT’s I-95 Lane Monitoring Reports, the most recent of which reported data collected in April 2009. These data were compared against the outputs of similar studies conducted in prior years as documented in FDOT’s biannual HOV Lane Monitoring Reports.

Pre and post deployment on-board surveys were conducted to assess the impact of Miami UPA Phase 1A on transit user perceptions. These surveys were conducted in May 2008 (baseline) and May 2009 (post-deployment).

#### **3.2 Scope of Evaluation**

Corridor transit services are separated into two tiers for evaluation purposes:

Tier 1: Transit services that are part of the UPA project are defined as Tier 1 services. These services are likely to experience changes in performance (service capacity, travel time, reliability, etc) that are aimed at stimulating increased ridership and transit mode share. These services require to be evaluated in full using all the data sources identified in the National and Local evaluation plans.

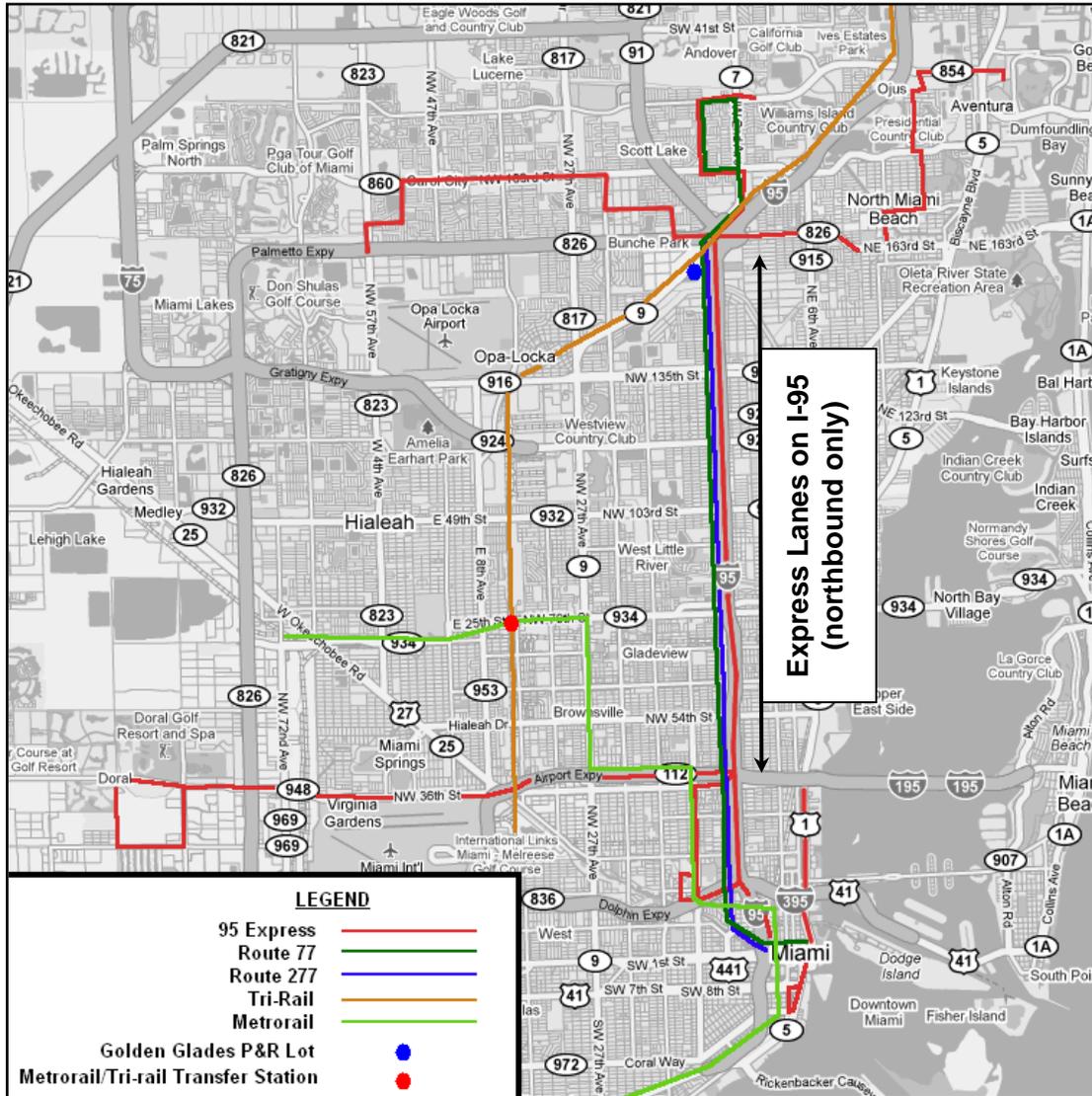
Tier 2: Transit services that are not part of the UPA project, but that operate within the UPA corridors, are defined as Tier 2 services. While these are not technically within the scope of the UPA evaluation, it is important to document any changes in service quantity and ridership on these services during the evaluation periods, so that corridor level impacts of the UPA project can be assessed. For instance, UPA funded improvements to transit services within a corridor may attract transit riders from other non-UPA funded services. While these riders represent a ridership increase on the UPA funded services, they do not represent new transit riders. Data collection activities related to these systems are therefore limited to transit service characteristics and ridership.

The following table summarizes the services that are proposed for evaluation under each of the specified tiers. The alignment of these services is shown in Figure 4.

**Table 1 – Transit Services Defined under Each Evaluation Tier**

Transit Agency*	Tier 1 – Full Evaluation	Tier 2 – Partial Evaluation
Miami Dade Transit	95 Express	Routes 77 & 277
Tri-Rail		Golden Glades Interchange to MetroRail Station

\* Broward County Transit services are not included in this evaluation report as they are not being implemented until later phases of the Miami UPA project.



**Figure 4 – Scope of Miami Phase 1A Transit Evaluation**

MDT Routes 77 and 277(7<sup>th</sup> Ave. MAX) run parallel to I-95 on 7<sup>th</sup> Avenue. They are not part of the UPA project, but do provide service between Golden Glades Interchange and downtown Miami. Tri-Rail is a regional commuter rail service running north-south between West Palm Beach and Miami International Airport. The service allows people living in Broward and Palm Beach counties to access downtown Miami (by transferring to MetroRail), and also features a station at Golden Glades Interchange, and therefore is included in this evaluation. These routes are therefore considered as Tier 2 transit services.

## 4 Exogenous Factors and Regional Trends

Implementation of Express Lanes on the northbound section of I-95 was just one event impacting travel patterns on the corridor. This section summarizes some of the other major events that occurred during the 15 month period between January 2008 and March 2009 that may have had an impact on travel patterns and mode choice decisions within the corridor.

### 4.1 Changes in MDT Service Characteristics

#### 4.1.1 Fare Structure Changes

MDT's fare structure was revised in October 2008, as illustrated in Table 2.

**Table 2 - Fare Structure Before and After October 2008**

	Pre 10/2008	Post 10/2008	% change
Express Bus One-Way Fare	\$1.85	\$2.35	27.0%
Monthly Metropass	\$75.00	\$100.00	33.3%
Monthly Metropass - Group Discount (100 or more passes)	\$65.00	\$85.00	30.8%

Table 2 shows that the October 2008 fare restructuring imposed a significant increase in fare and pass costs for 95 Express users. The regular cash fare was increased by 50 cents from \$1.85 to \$2.35, representing a 27 percent increase. The cost of the monthly Metropass was increased by \$25 from \$75 to \$100, representing a 33.3 percent increase. The discounted pass available through Miami area employers was increased by \$20 from \$65 to \$85, representing a 30.8 percent increase.

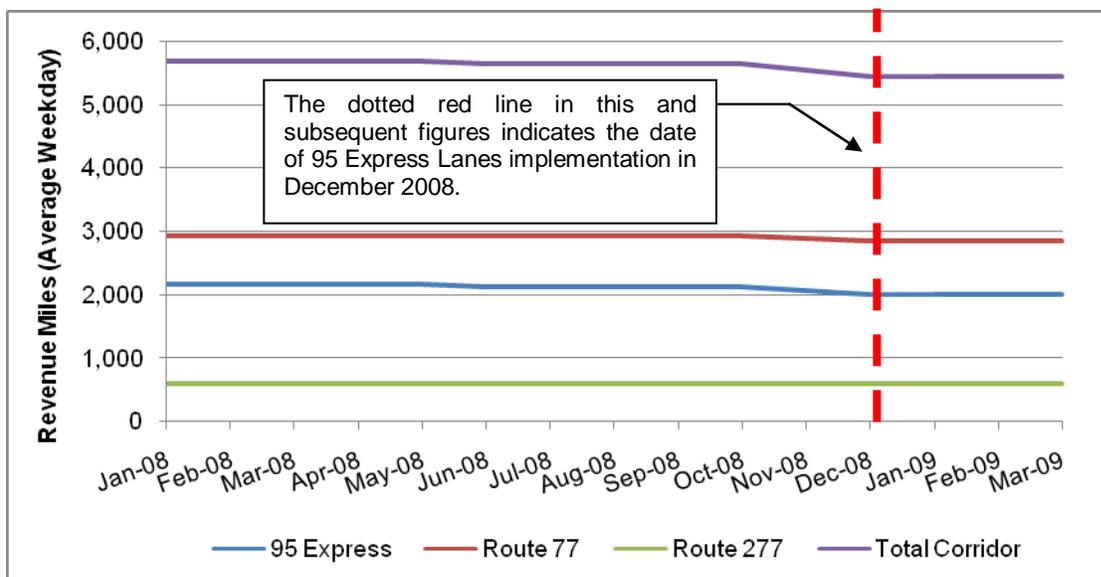
#### 4.1.2 Service Changes

MDT implemented systemwide service changes in June 2008 and June 2009. The changes made to the UPA corridor routes are summarized in Table 3, which shows that most of these changes are service cuts, which reflects a systemwide effort by MDT to reduce operating costs due to budget restrictions. For the 95 Express service this meant that some reverse commute direction trips with very low patronage were converted to deadhead trips to save revenue miles). Two new trips were added to the 95 Express bus service from downtown Miami to Golden Glades Interchange in June 2009 in response to increased passenger demand following Express Lanes implementation. This was after the post-deployment data collection period of January to March 2009 and after the post-deployment survey in May 2009. Thus, any impact of these two new trips would not be picked up in this evaluation study.

**Table 3 Changes Made to UPA Corridor Services in 2008 and 2009**

Route	June 2008	June 2009
95 Express	<ul style="list-style-type: none"> <li>– Midday service to downtown Miami and the Civic Center will be discontinued.</li> <li>– The last morning trip to downtown Miami will be at 9:30 a.m.</li> <li>– The first afternoon trip from downtown Miami (Courthouse) will be 3:10 p.m.</li> <li>– The first afternoon trip from the Civic Center will be 3:30 p.m. Alternative service is available by using Tri-Rail with a transfer to and from Metrorail or by catching Route 77 to and from downtown Miami.</li> <li>– Minor schedule adjustments will be made in anticipation of the opening of the new I-95 northbound express lanes this summer as well as the continued construction of the southbound I-95 express lanes.</li> </ul>	<ul style="list-style-type: none"> <li>– The segment from Miami Ave. to Golden Glades via NW 199 St., NW 7 Ave., and NW 2 Ave. will be discontinued. Passengers can use Metrobus Route 77 or Broward County Transit routes 18, University Breeze, and 441 Breeze.</li> <li>– <b>Two new northbound trips will be added to the PM schedule departing from downtown Miami [to Golden Glades] at 4:20 and 5:30 p.m.</b></li> <li>– The following trips will be discontinued because of low ridership: <ul style="list-style-type: none"> <li>7:15 a.m. – Golden Glades to NW 36 St. and 87 Ave.</li> <li>8:25 a.m. – Golden Glades to downtown Miami</li> <li>8:30 a.m. – Carol City to Golden Glades</li> <li>8:45 a.m. – Golden Glades to dtown Miami/ Brickell</li> <li>4:35 p.m. – NW 36 St. /87 Ave. to Golden Glades</li> <li>5:10 p.m. – Golden Glades to Carol City</li> <li>6:45 p.m. – Civic Center to Golden Glades</li> </ul> </li> </ul>
Route 277	– No changes	– No changes
Route 77	<ul style="list-style-type: none"> <li>– Overnight service that operates in the early morning hours will be discontinued.</li> <li>– S/B from NW 183 Street, the last trip will be 11:55pm and the first trip will leave at 4:31 am</li> <li>– N/B from Downtown Miami, the last trip is at 1:10 a.m. and the first trip is at 5:25 a.m.</li> </ul>	– No changes

Figure 5 shows the average weekday revenue miles provided on the 95 Express routes between January 2008 and March 2009, as well as on Routes 77 and 277. Tri-Rail service quantity data was not available in a format compatible with the MDT data, so the total corridor service quantity line does not include the Tri-Rail service. Table 4 compares the three-month average figures for the evaluation periods of Jan-March 2008 and Jan-March 2009.



**Figure 5 Revenue Miles (Average Weekday) on UPA Corridor Routes**

**Table 4 Corridor Revenue Miles (Three Month Average 2008 vs 2009)**

	Jan 08 - Mar 08	Jan 09 - Mar 09	% change
95 Express	2,156.8	2,006.9	-7.0%
Route 277	599.3	599.3	0.0%
Route 77	2,931.2	2,844.1	-3.0%
Total UPA Corridor*	5,687.3	5,450.3	-4.2%

\* Tri-Rail Revenue Miles data at the corridor level not available

Figure 5 shows that the June 2008 service changes documented in Table 3 have the net effect of slightly reducing service quantity on the 95 Express and Route 77, while Route 277 service quantity remained constant. Comparing January to March 2008 versus 2009, a 7.0 percent reduction in 95 Express service quantity and a 4.2 percent reduction in overall corridor service quantity were observed. MDT staff estimate that at least half the reduction in 95 Express revenue miles was due to the previously mentioned low patronage reverse commute off-peak trips being converted to deadhead.

## 4.2 Gas Prices

Gas prices have been unusually volatile in recent times, potentially impacting the attractiveness of private auto use versus alternative modes. Figure 6 below shows historic monthly average prices for regular unleaded gasoline in the Miami metro area from January 2007 through June 2009. Also shown on the figure are the timing of other events within the same period that could potentially affect travel patterns and mode choice decisions within the corridor, as well as the timing of the pre and post deployment data collection periods and survey exercises.

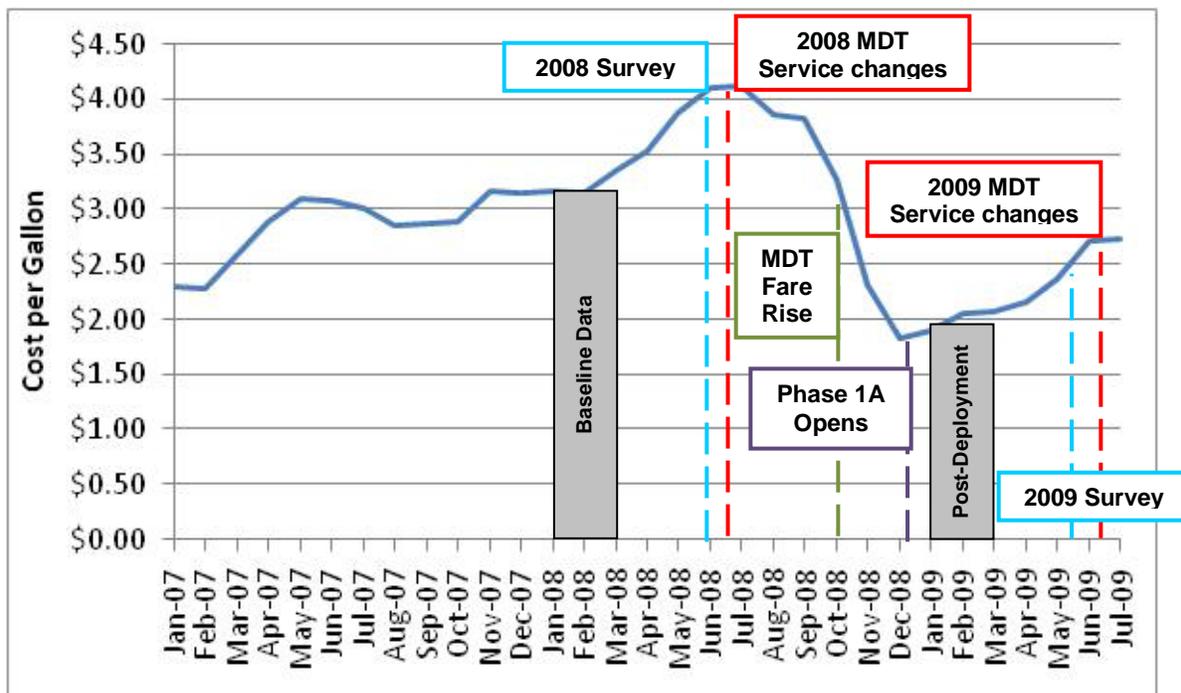


Figure 6 - Historic Gas Prices in Miami in Relation to other Events Affecting UPA Corridor\*  
 \* Source: American Automobile Association

Figure 6 shows that the baseline data collection period occurred when gas prices were around \$3 per gallon while the 2009 data collection period occurred when gas prices were at only \$2 per gallon. Between these two periods some minor changes were made to MDT transit services on the corridor (see Table 3) in June 2008 and the systemwide fare increase was also implemented in October 2008. The 2008 on-board survey was conducted during the period of unusually high gas prices when gas prices were over \$4.00 per gallon. Prices then began to drop in the Fall of that year and by the time that Phase 1A opened, prices were under \$2.00 per gallon. By the time the 2009 survey was conducted in May, gas prices had risen to just over \$2.50 per gallon.

Overall, the figure illustrates the fact that the opening of Miami UPA Phase 1A was just one of many events that potentially impacted travel on the corridor over the 15 month evaluation period between January 2008 and March 2009. These exogenous effects will be taken in to account later in the report when discussing the impact of the UPA project on transit services within the corridor. It should be noted that the economic recession could also have an impact on corridor travel patterns, but a detailed assessment of this is considered to be outside the scope of this evaluation effort.

### 4.3 Regional Transit Ridership Trends

The following two figures provide systemwide MDT Metrobus and Tri-Rail ridership, in order to provide a regional perspective on ridership trends over the 15 month evaluation period and to assess whether any exogenous factors may have had an impact on transit service within the UPA corridor.

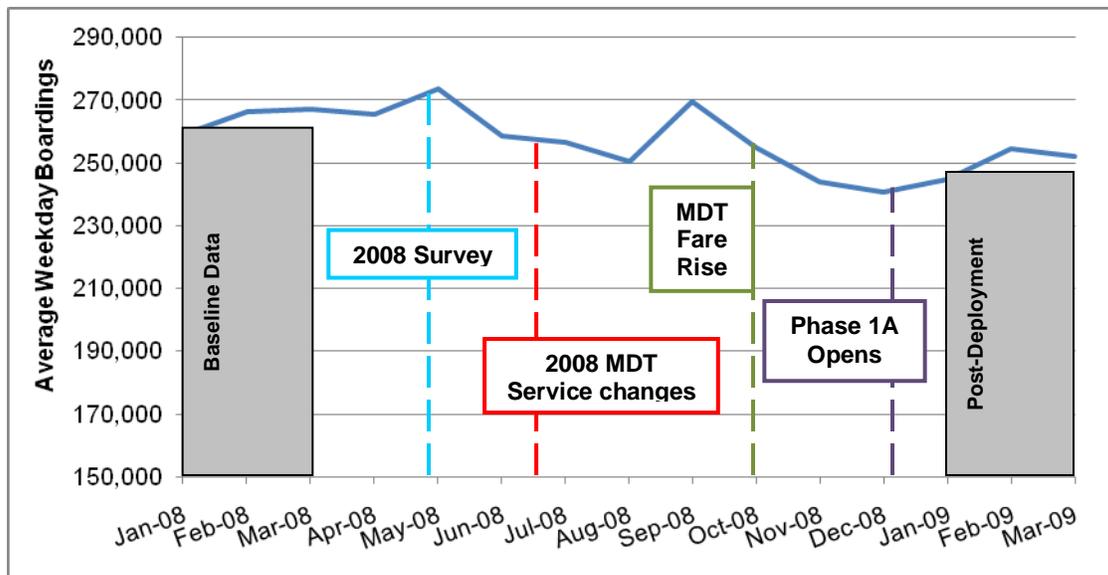
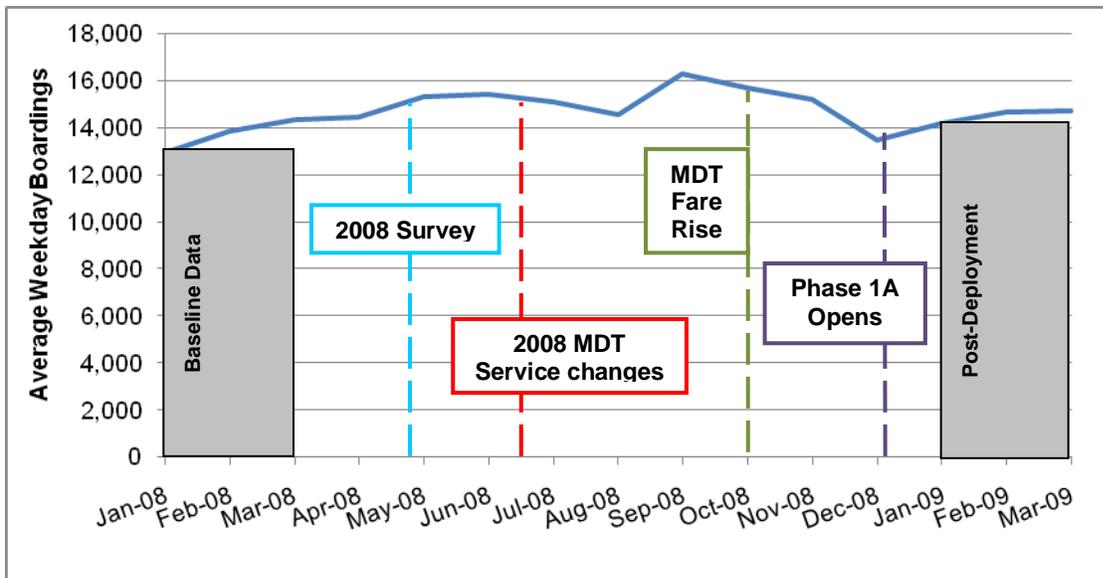


Figure 7 - Systemwide MDT Bus Average Weekday Ridership

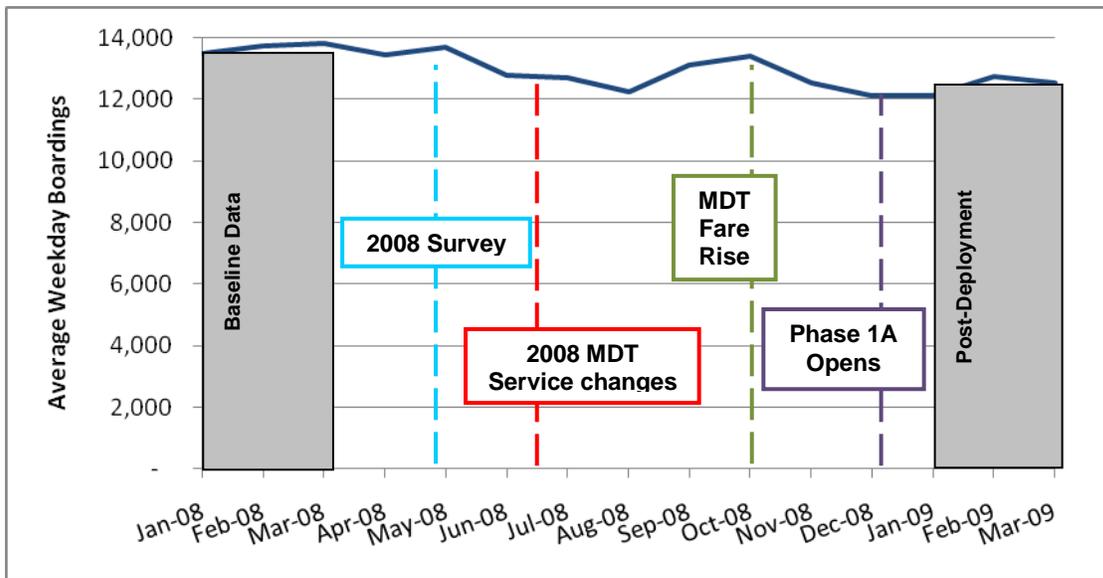
Figure 7 shows that MDT Metrobus ridership has been on a generally downward aggregate trend over most of the 15 month period, reaching a minimum around December 2008, before recovering slightly in the first few months of 2009.



**Figure 8 Systemwide Tri-Rail Average Weekday Ridership**

Tri-Rail ridership showed a slight upward trend, peaking in Fall 2008, then began dropping until the end of 2008, in a similar fashion to MDT systemwide ridership.

Figure 9 below presents the aggregate Express bus ridership on all MDT routes except the 95 Express.



**Figure 9 MDT Express Bus Average Weekday Ridership (All routes except 95 Express)**

Figure 9 shows that aggregate MDT express bus ridership exhibited a slight downward trend over the 15 month period shown, with close to 14,000 riders at the start of 2008, dropping to close to 12,000 riders by March 2009.

Table 5 compares the January to March weekday average ridership for 2008 and 2009. It can be seen that systemwide MDT ridership has decreased by 5.2 percent and express bus ridership has decreased by almost 9 percent, suggesting a general slight loss in regional bus ridership. In contrast, Tri-Rail ridership has increased slightly by 5.7 percent.

**Table 5 Average Ridership: Jan-March 2008 vs Jan-March 2009**

	<b>Jan 08 - Mar 08</b>	<b>Jan 09 - Mar 09</b>	<b>Percent Change</b>
MDT Systemwide	264,127	250,300	-5.2
MDT Express Bus	13,670	12,449	-8.9
Tri-Rail	13,735	14,519	+5.7

Overall, in regional terms it appears that the Fall 2008 months leading up to Express Lanes implementation were a time when regional transit ridership was in slight decline, possibly due to the previously discussed drop in gas prices, increased MDT fares, and economic recession. The low ridership level observed in December 2008 is likely to be a seasonal effect related to the holiday season. In the first few months of 2009, immediately after Express Lanes implementation, regional ridership began to rise again.

## 5 Transit Service Performance Impacts

This section documents the impact of Express Lanes implementation on the performance of the 95 Express Bus service, monitoring travel time and service reliability over this period.

### 5.1 Travel Time

#### 5.1.1 Transit Travel Times on I-95

Floating car-based travel time runs were conducted during the PM Peak in April 2009 as part of the evaluation of the Miami UPA project on traffic within the corridor. Table 6 shows how northbound travel speeds and times compare between the Managed Lanes (ML) and General Purpose Lanes (GPL), while Table 7 compares the 2009 time and speed performance with those observed in 2008.

**Table 6 - 2009 PM Peak Period Travel Speed and Time Savings (Northbound)\***

Interstate 95 Segment	Length (miles)	ML Speed (mph)	GPL Speed (mph)	Δ (mph)	Time Savings (min:sec)
State Road 112 to NW 79 <sup>th</sup> Street	2.39	61.9	48.4	+13.5	0:39
NW 79 <sup>th</sup> Street to NW 125 <sup>th</sup> Street	2.91	59.1	35.7	+23.4	1:56
NW 125 <sup>th</sup> St to Golden Glades Interchange	2.24	49.7	37.9	+11.8	0:51
<b>Total Segment</b>	<b>7.55</b>	<b>56.8</b>	<b>39.7</b>	<b>+17.1</b>	<b>3:26</b>

\* Source: FDOT report "2009 Evaluation Report. 95 Express Lanes – Phase 1A". Kimley-Horn & Cambridge Systematics.

Table 6 above compares sampled 2009 travel speeds in the Managed Lanes and General Purpose Lanes for three different northbound sections of I-95 between downtown Miami and Golden Glades Interchange. It can be observed that the Managed Lane speeds are significantly higher than the General Purpose Lane speeds for each section, particularly the central section between NW 79<sup>th</sup> St and NW 125<sup>th</sup> St. Overall these increased speeds produce time saving of around 3.5 minutes for the 7.55 mile corridor, meaning that northbound transit services save around 3.5 minutes of total travel time by traveling in the Managed Lanes instead of the General Purpose Lanes.

**Table 7 - PM Peak Period Travel Speed Comparison - 2008 vs 2009 (Northbound)\***

	Travel Speed (mph)		Travel Time (min:sec)	
	HOV/ML	GPL	HOV/ML	GPL
<b>2008</b>	18.1	18.8	25:02	24:06
<b>2009</b>	56.8	39.7	7:59	11:25
<b>Δ</b>	<b>+38.7</b>	<b>+20.9</b>	<b>-17:03</b>	<b>-12:41</b>
<b>Δ%</b>	<b>+213%</b>	<b>+111%</b>	<b>-68%</b>	<b>-53%</b>

\* Source: FDOT report "2009 Evaluation Report. 95 Express Lanes – Phase 1A". Kimley-Horn and Cambridge Systematics. Travel time columns added by NBRTI.

Table 7 shows that northbound travel times and speeds in 2009 were significantly improved in both the Managed Lanes and General Purpose Lanes compared to 2008. In 2008 it took about 25 minutes to travel the 7.5 miles from downtown Miami to Golden Glades during the PM peak period in the HOV lane, while in 2009 this same distance took approximately 8 minutes, representing huge time savings of 17 minutes for 95 Express users.

### 5.1.2 95 Express Scheduled Travel Times

The above analysis only covers travel time changes on I-95 itself. As shown in Figure 4, the 95 Express service routes extend in different directions at either end of the I-95 trunk section of the route. Table 8 below shows how the significant time savings made possible by the Express Lanes has impacted actual scheduled travel times between the first stop in downtown Miami, approximately three miles south of the Express Lanes, and Golden Glades Interchange at the northern end of the Express Lanes.

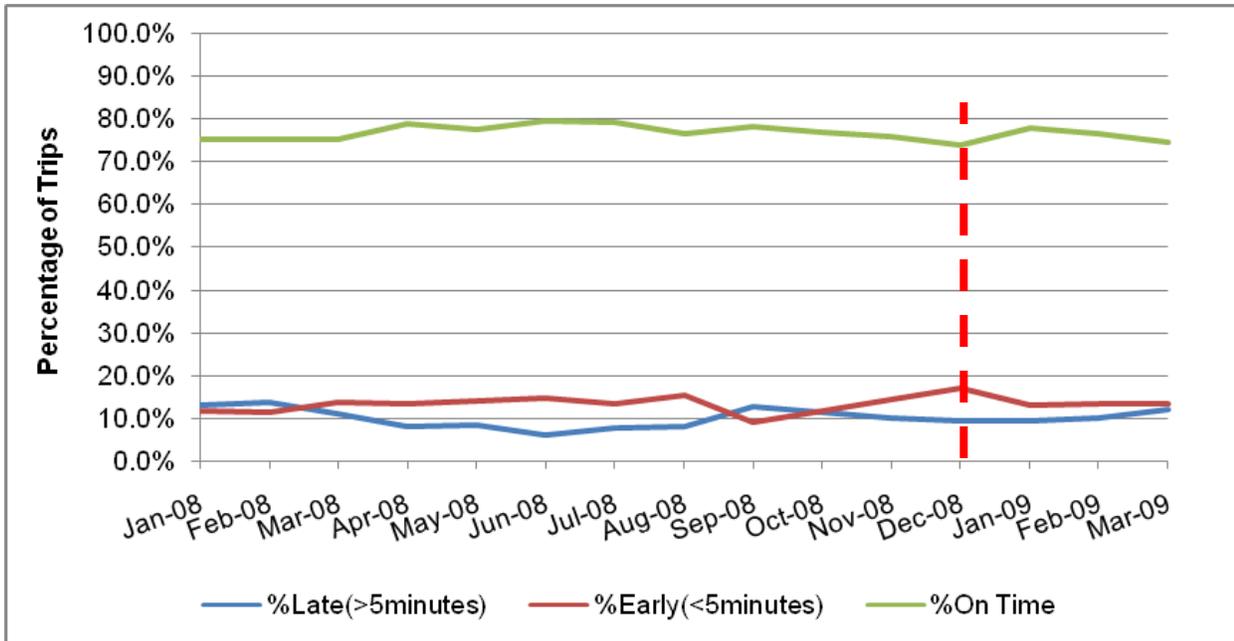
**Table 8 Scheduled 95 Express Travel Times**

	Dec 2007	June 2008	June 2009
<b>Southbound AM Peak</b> (GGI to SE 1 <sup>st</sup> and 1 <sup>st</sup> )	32 minutes	32 minutes	32 minutes
<b>Northbound PM Peak</b> (Courthouse to GGI)	32 minutes	24 minutes	22 minutes

Table 8 shows that scheduled travel times on the southbound section of the 95 Express route have remained at 32 minutes from 2007 to 2009. In contrast, the scheduled northbound times have reduced significantly over this period. Scheduled times were reduced from 32 minutes in 2007 to 24 minutes in 2008 in anticipation of Express Lanes implementation, then reduced by a further two minutes when the actual travel time benefits were found to be even greater than initially predicted. In comparison then, it can be observed that Express Lanes implementation has reduced 95 Express scheduled travel times by approximately 10 minutes between downtown Miami and GGI.

## 5.2 Reliability

Figure 9 provides the on-time performance figures for the 95 Express bus service between January 2008 and March 2009. A service is defined as late if it arrives at a scheduled stop more than 5 minutes after the scheduled time, and early if the bus arrives at a scheduled stop more than five minutes ahead of schedule. It should be noted that these data represent the entire length of the 95 Express routes in both directions, as it was not possible to isolate the northbound direction or the I-95 section of the routes.



**Figure 10 - On-Time Performance of 95 Express Bus Service (Northbound and Southbound)**

**Table 9 - On Time Performance –  
Pre and Post Deployment Comparison (Northbound and Southbound)**

	Jan 08 - Mar 08	Jan 09 - Mar 09	% Change
On Time	75.1%	76.3%	1.2
Early ( < 5 minutes)	12.4%	13.4%	1.0
Late ( > 5 minutes)	12.5%	10.3%	-2.2

Figure 10 shows that on-time performance has remained relatively constant over the 15 months period. There was very little difference in the three-month averages for 2008 and 2009, through the proportion of late services dropped from 12.5 to 10.3 percent when comparing the two evaluation periods. The slight rise in the proportion of late services between June and September 2008 is likely to be due to the new schedule timings implemented by MDT in June 2008 that decreased scheduled northbound travel times by 10 minutes in anticipation of Express Lanes implementation. Lack of specific data for the Express Lanes sections of the 95 Express transit routes means that further reliability benefits potentially experienced in the northbound direction could have gone undetected.

## 6 Transit Service Usage Impacts

### 6.1 Ridership

The following figures provide ridership information in terms of average weekday boardings for the different individual transit services within the UPA corridor, and for all the corridor services combined, between January 2008 and March 2009.

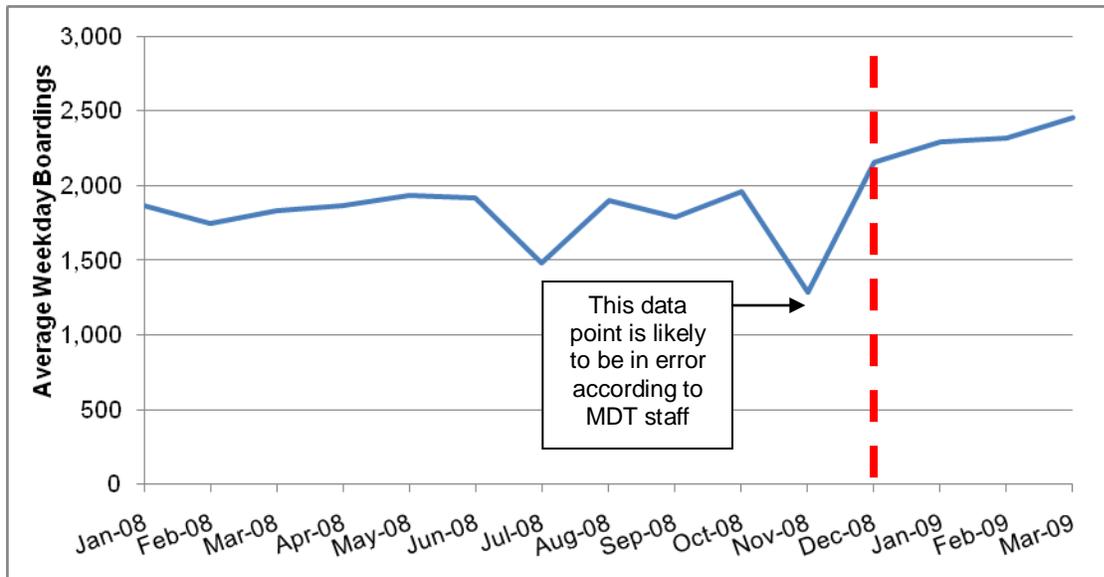


Figure 11 - 95 Express Bus - Average Weekday Boardings (Northbound and Southbound)

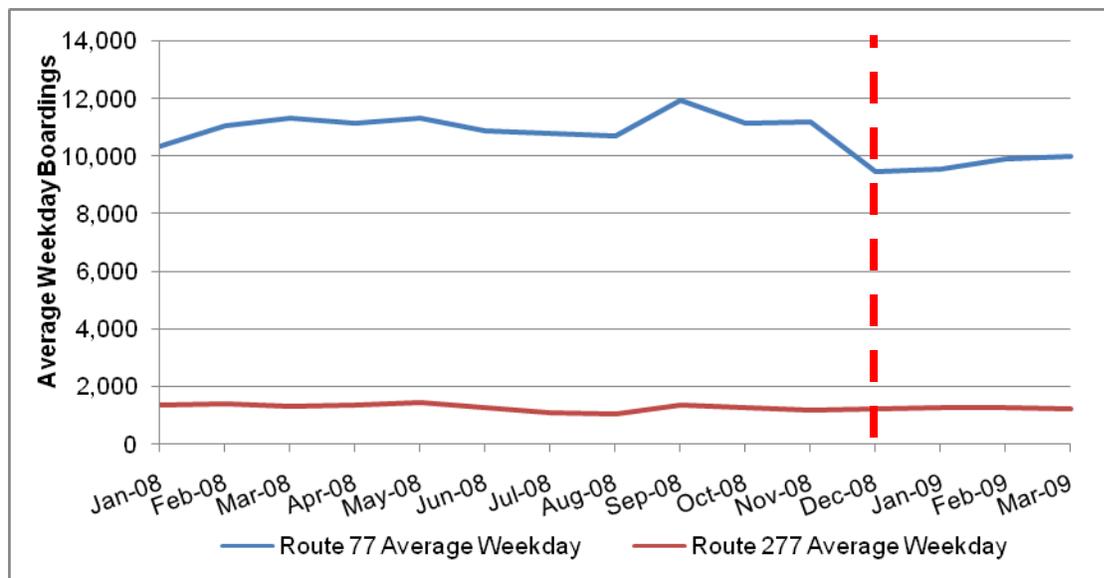
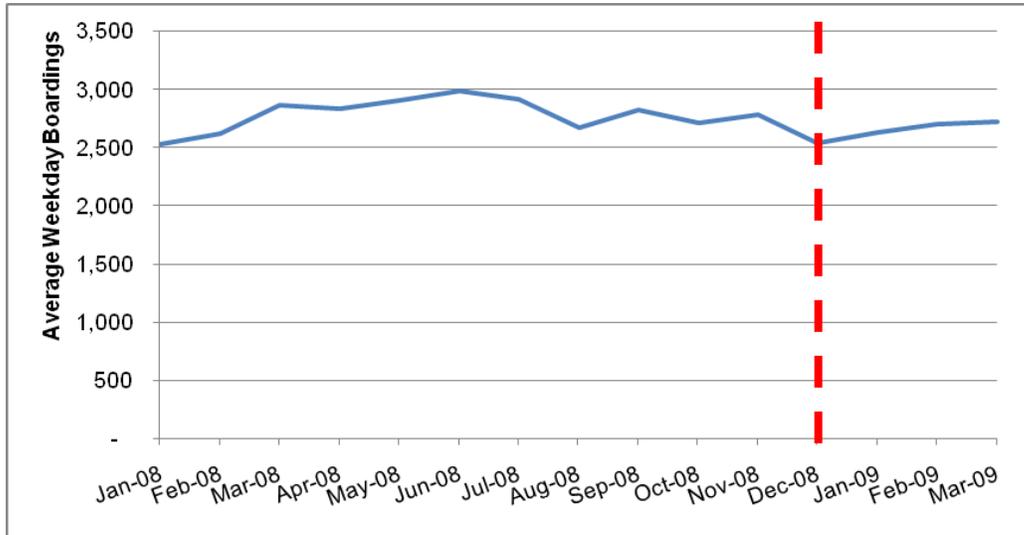
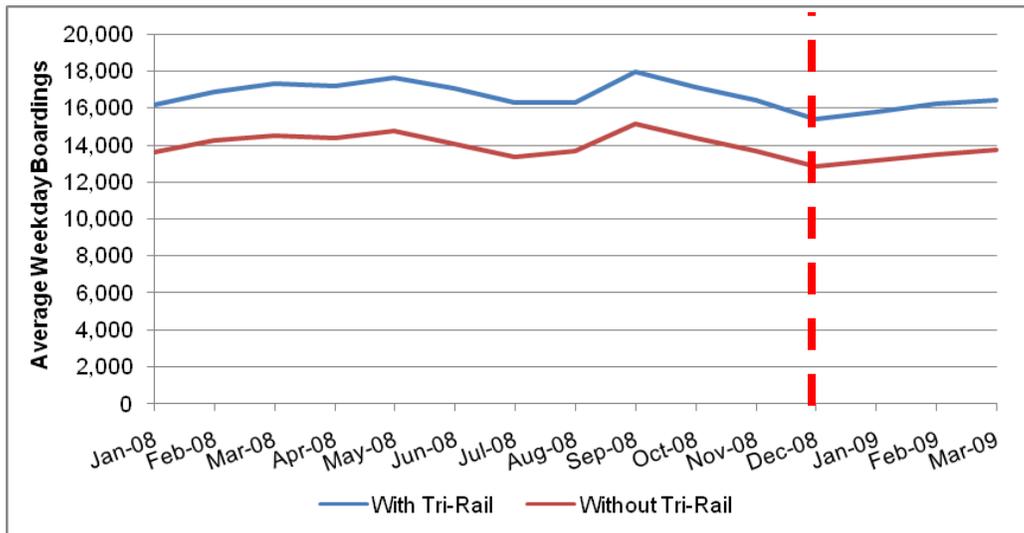


Figure 12 - Route 77 and 277 - Average Weekday Boardings (Northbound and Southbound)



**Figure 13 - Tri-Rail UPA Corridor - Average Weekday Boardings (Northbound and Southbound)**



**Figure 14 - Total UPA Corridor Boardings (Northbound and Southbound)**

**Table 10 - Average Weekday Boardings  
- Pre and Post Deployment Comparison (Northbound and Southbound)**

	Jan 08 - Mar 08	Jan 09 - Mar 09	% change
95 Express	1,813	2,353	29.8%
Route 277	1,363	1,262	-7.4%
Route 77	10,917	9,824	-10.0%
Tri Rail UPA Corridor	2,673	2,686	0.5%
Total UPA Corridor with Tri-Rail	16,766	16,126	-3.8%
Total UPA Corridor without Tri-Rail	14,093	13,439	-4.6%

Figure 11 shows that 95 Express ridership remained between 1,500 and 2,000 riders per day from January 2008 through Fall 2008 (the low November 2008 value has been identified

as suspect by MDT staff, likely due to transitioning to a new ridership data collection system around that time), before increasing to over 2,000 riders per day in December 2008, coinciding with Express Lanes implementation. The first three months show a continued rise in ridership up to 2,500 riders by March 2009. This represents an average ridership increase of 540 riders (29.8% increase) when comparing average ridership during the first three months of 2008 and 2009, as shown in Table 10.

Looking at Figure 12, it can be seen that ridership on Routes 277 and 77 both dropped slightly over the 15 month evaluation period, with the same low-point observed in December 2008, again likely due to the holiday season. Comparing the first three months of 2008 and 2009, Route 77 ridership decreased by 10 percent while Route 277 ridership decreased by 7.4 percent, equating to a reduction of approximately 1,200 riders per day. Figure 13 shows that Tri-Rail ridership within the UPA corridor (Golden Glades to MetroRail) remained relatively consistent over the 15 month period (staying between 2,500 and 3,000 riders), also showing the same trend for decreased ridership in the last few months of 2008 followed by a slight recovery in early 2009, as was observed on the equivalent bus services.

Considering UPA corridor ridership as a whole, as shown in Figure 14, it can be seen that aggregate ridership remained relatively consistent until Fall 2008, before dropping to a low point in December 2008, only to rise again in the first few months of 2009, likely due to the influence of the holiday season. This represents a net reduction of about 650 riders per day (4.6% reduction without Tri-Rail, 3.8 percent reduction with Tri-Rail) when comparing the three-month averages shown in Table 10.

Overall, it appears that northbound Express Lanes implementation has had a positive impact on 95 Express ridership which has risen significantly since December 2008, an increase of almost 30 percent compared to the same three month period in the previous year. However, ridership losses on the parallel NW 7<sup>th</sup> Avenue corridor have more than offset these gains resulting in a slight net loss in overall corridor ridership.

Average weekday boardings per revenue mile were compared for the two three-month evaluation periods in 2008 and 2009. Service quantity data for Tri-Rail is not available at the station level and has therefore not been included.

**Table 11 - Average Weekday Boardings per Revenue Mile  
- Pre and Post Deployment Comparison (Northbound and Southbound)**

	Jan 08 - Mar 08	Jan 09 - Mar 09	% Change
95 Express	0.84	1.17	39.5%
Route 277	2.27	2.11	-7.4%
Route 77	3.72	3.45	-7.3%
Total UPA Corridor	2.48	2.47	-0.5%

Table 11 shows that boardings per revenue mile increased by 39.5 percent on the 95 Express, while reducing by over seven percent on both Routes 77 and 277 over the same period. The net result of this was that overall corridor boardings per revenue mile remained relatively unchanged between the two periods. The large increase in 95 Express productivity is due to the removal of some off-peak underused service as well as the increased ridership.

While it may seem reasonable to assume that riders have transferred from the NW 7<sup>th</sup> Avenue routes to the 95 Express, according to MDT staff this is highly unlikely. Thus, it appears that the ridership losses on the NW 7<sup>th</sup> Avenue routes are not related to the ridership gains on the 95 Express. We conclude that increased ridership on the 95 Express has not translated into corridor level ridership impacts partly because the 95 Express carries less than one fifth of the total bus ridership on the corridor, and partly because of a general trend for ridership loss across the region due to reductions in service quantity, fare increases, and other exogenous economic factors.

## 6.2 Park and Ride Utilization

Figure 15 and Table 12 presents parking lot utilization information for the Golden Glades P&R lot. Parking capacity at Golden Glades has remained constant at 1,007 spaces over the 15 month evaluation period.

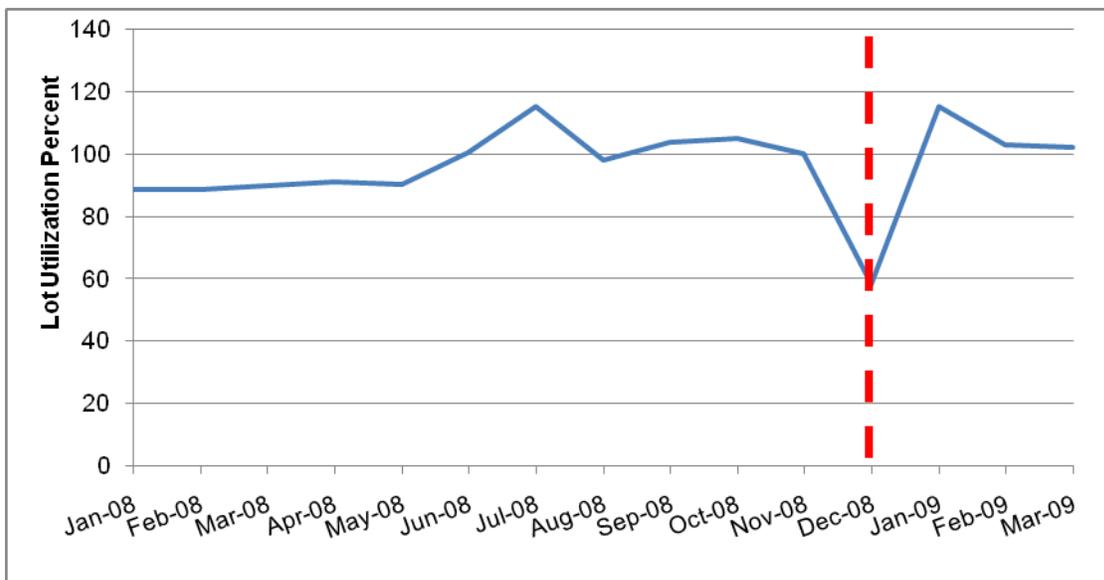


Figure 15 - Golden Glades Park and Ride Utilization

Table 12 - Comparison of Three Month Averages of Park and Ride Utilization

	Jan 08 - Mar 08	Jan 09 - Mar 09	% Change
Golden Glades Capacity	1,007	1007	0.0%
Golden Glades Count	894	1,073	20.1%
Golden Glades Utilization (%)	88.7%	106.6%	20.1%

Figure 15 shows that the Golden Glades lot was fully utilized over the summer of 2008 (coinciding with the abnormally high gas prices around that time), with utilization well over 100 percent until December 2008, when it dropped to around 60 percent, probably due to the holiday season, before rising again to above 100 percent utilization in the first months of 2009. Overall the figure shows that the Golden Glades lot is operating at full capacity, which is currently limiting potential ridership increases on 95 Express bus services. This problem is being addressed by the addition of five hundred additional parking spaces at a new East Lot at Golden Glades in December 2009.

### 6.3 Transit Mode Share

FDOT has monitored operations on the I-95 HOV facility on a biannual basis since 1995. Data including traffic volume counts, speed measurements, and vehicle occupancy counts were collected in both directions at 10 locations along the 60 mile route, which extends from downtown Miami to Palm Beach County. Two of these locations exist between Golden Glades Interchange and downtown Miami, one just south of Golden Glades Interchange and one at NW 79<sup>th</sup> St, as shown in Figure 16 below. The data collection methodology is based on a sampling approach, with data collected over a two to three day period each spring. In 2009, vehicle occupancy and traffic volume data was collected during the PM peak period in the northbound direction at one location only – just south of Golden Glades Interchange.

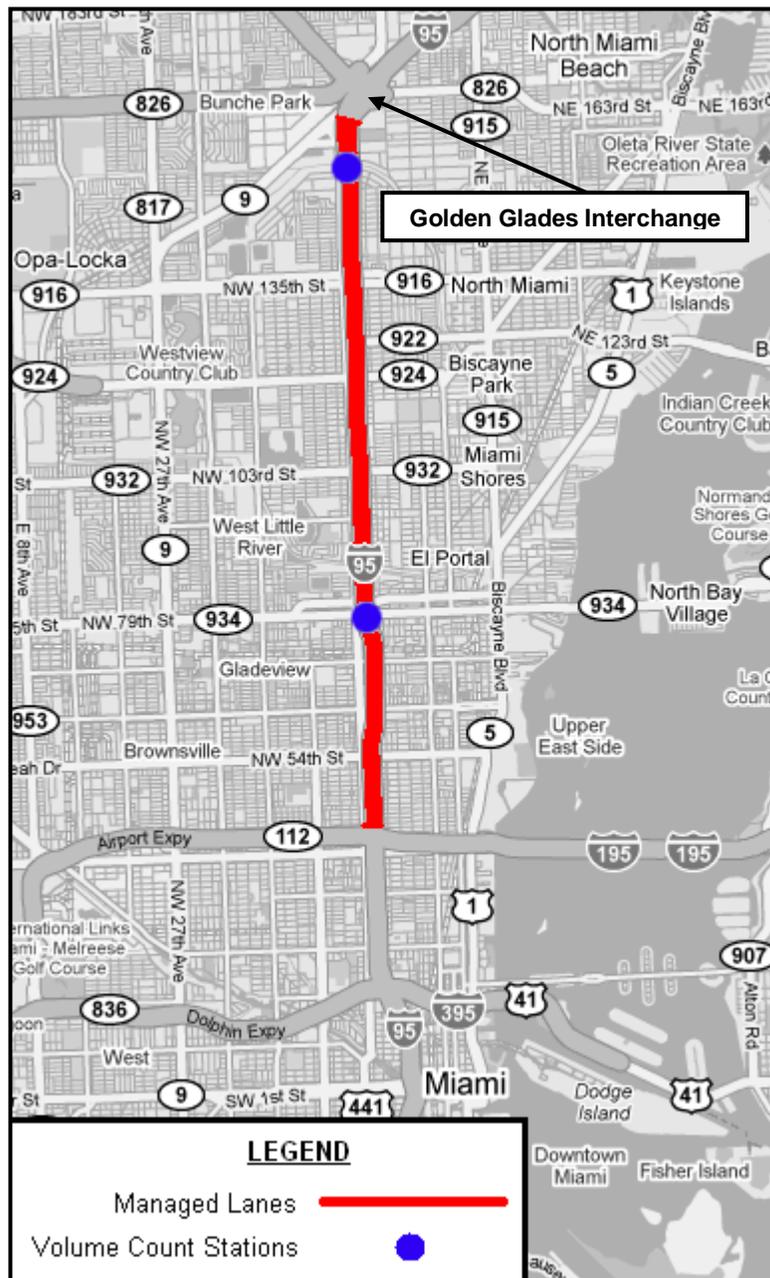


Figure 16 – HOV Lane Monitoring Locations

### 6.3.1 Average Vehicle Occupancy Trends

Table 13 provides Average Vehicle Occupancies (AVO) on both the HOV/Express Lanes and the entire facility in the northbound direction during the PM peak period (4 to 6pm) between 2002 and 2009. The table also shows the impact of the 95 Express bus service on overall AVO by providing the AVO with and without this service.

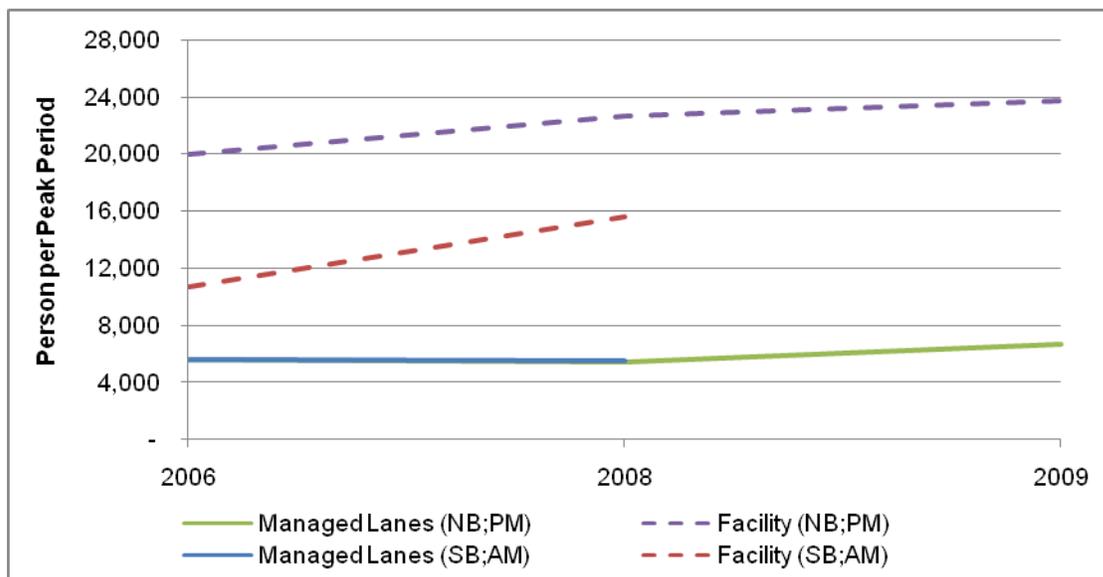
**Table 13 - AVO Values South of Golden Glades (Northbound; PM Peak Period - 4 to 6pm)**

		2002	2004	2006	2008	2009
Managed Lanes	AVO w/ 95X	2.36	1.5	2.23	1.95	1.39
	AVO w/o 95X	2.09	1.28	1.99	1.68	1.22
Facility	AVO w/ 95X	1.46	1.25	1.26	1.50	1.39
	AVO w/o 95X	-	-	1.21	1.45	1.34

Table 13 illustrates that the 2009 managed lane AVO values were significantly lower than those observed in 2008. This is likely due to the combined effect of allowing single occupant vehicles to use the managed lanes, as well as raising the vehicle occupancy requirement from unregistered 2+ to registered 3+. This has resulted in facility AVO values also going down.

### 6.3.2 Person Throughput Trends

Figure 17 provides person throughput on both the managed lanes and the entire facility between 2006 and 2009, by multiplying the peak period AVO values presented in Table 13 above by peak period traffic volumes provided by FDOT. Southbound person throughput is provided for the AM peak period (7 to 9am) and northbound person throughput is provided for the PM peak period (4 to 6pm). 2009 person throughput information is only available in the northbound direction. The corresponding Table 14 compares the person throughput figures from 2008 and 2009 broken out by vehicle type.



**Figure 17 - Person Throughput Trends – South of Golden Glades**

**Table 14 Person Throughput by Vehicle Type in Managed Lanes  
2008 vs 2009 (Northbound; PM Peak Period – 4 to 6pm)**

Vehicle Type	Managed Lanes (Total Person Vol per Peak Period)			Facility (Total Person Vol per Peak Period)		
	2008	2009	% Change	2008	2009	% Change
SOV	1,061	3,778	256.1%	9,141	12,206	33.5%
HOV 2	3,040	1,899	-37.5%	10,437	8,181	-21.6%
HOV 3	477	171	-64.2%	2,335	2,558	9.6%
Transit	810	821	1.4%	810	821	1.4%
Total	5,387	6,669	23.8%	22,723	23,766	4.6%

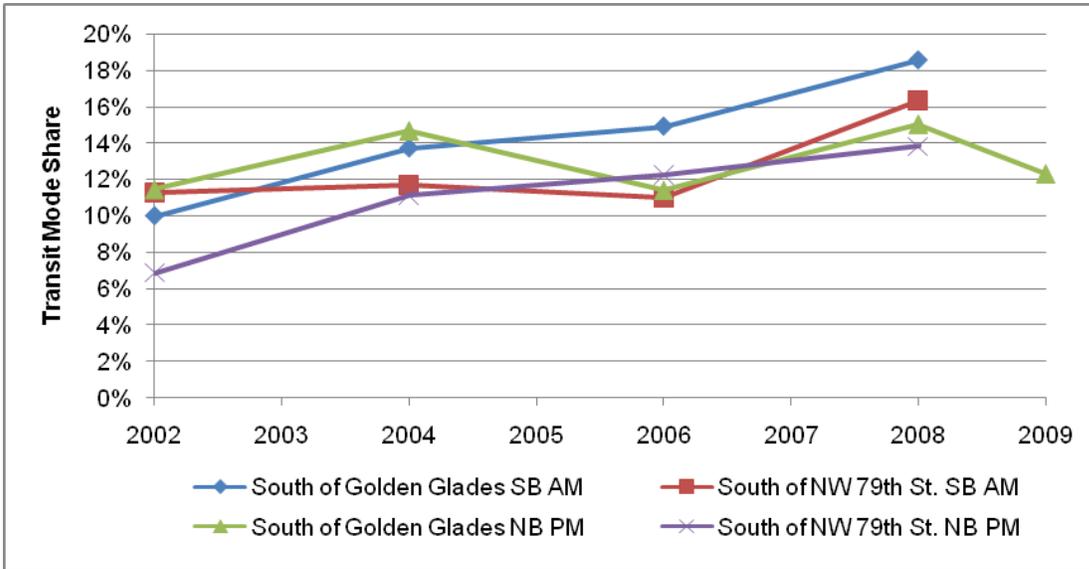
Figure 17 shows that northbound person throughput on the managed lanes has increased between 2008 and 2009 from 5,387 to 6,669 (23.8 percent increase) persons per peak period, which contrasts the unchanged person throughput between 2006 and 2008, suggesting that the observed increase is likely to be due to northbound Express Lanes implementation. Table 13 shows that this increase is due to a dramatic increase in Single Occupant Vehicles (SOVs) within the managed lanes (though SOVs were not technically allowed in the HOV lanes prior to Express Lanes implementation, clearly violation rates were high). It should also be noted that an extra lane of capacity was added to the facility. Transit person throughput was measured at an increase of only 1.4 percent, which is markedly different to the 30 percent ridership increase discussed in Section 6.1, though these two figures are not directly comparable due to differences in collection method (one day sample versus monthly average), time period (PM Peak period only versus all day), and direction (northbound only versus both directions).

It can also be seen from Table 14 that HOV2 and HOV3 person throughput in the managed lanes decreased significantly between 2008 and 2009, due to the raising of the occupancy level for two to three persons per vehicle, and due to the more restrictive registration requirements. Interestingly, HOV3 volume for the facility as a whole increased by 9.6 percent. This suggests that at least some of the HOV3 vehicles that used the HOV lane in 2008 have now switched to using the general purpose lanes.

The observed increase in managed lanes person throughput due to a dramatic increase in SOVs in the managed lanes appears to have had an impact on the facility as a whole, with a 4.6 percent increase in throughput. However, it is more difficult to attribute this directly to the Express Lanes project due to the fact that northbound facility person throughput also rose by a similar amount between 2006 and 2008 (see Figure 17), suggesting that this may be a longer term trend unrelated to Express Lanes implementation, and because an extra lane was added in the northbound direction.

### 6.3.3 Transit Mode Share - Managed Lanes

Figure 18 presents the transit mode share within the managed lanes between 2002 and 2009, defined as the proportion of peak period person throughput carried by the 95 Express bus service.

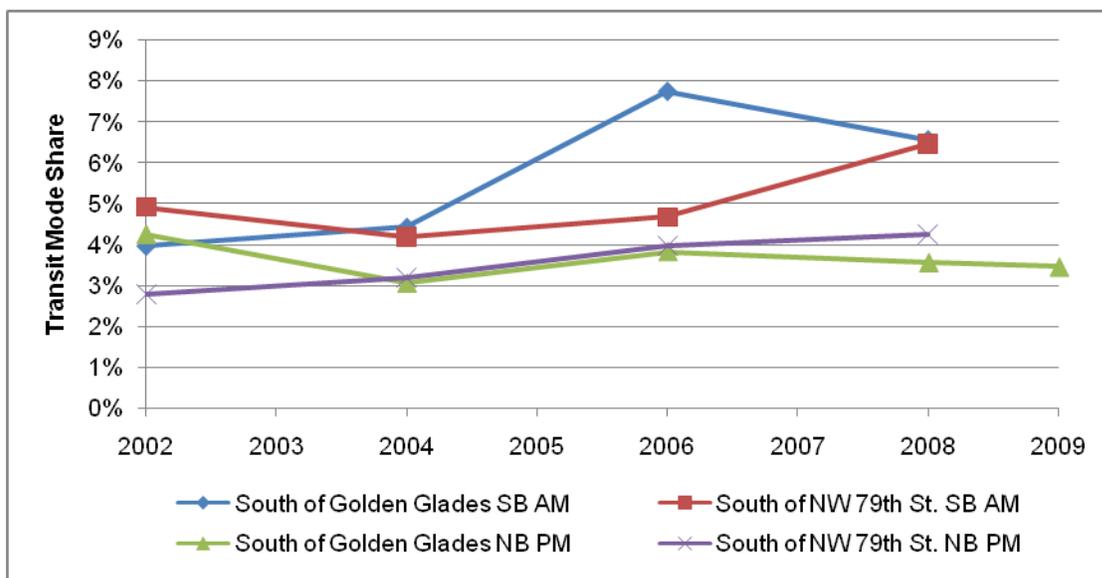


**Figure 18 - Transit Mode Share - Managed Lanes**

Figure 18 shows that transit mode share within the managed lanes has been on a generally upward trend since 2002, with average transit mode share rising from around 10 percent in 2002 to around 15 percent in 2008, with exact values depending on the direction and location. Looking specifically at the 2009 transit mode share value (northbound direction south of Golden Glades) it can be seen that this value has dropped from 15 percent in 2008 to 12.3 percent in 2009. This is due to the introduction of single occupant vehicles into the managed lanes, as illustrated in Table 14.

#### 6.3.4 Transit Mode Share - Facility

Figure 19 shows transit mode share for the facility (general purpose lanes plus managed lanes) from 2002 to 2009.



**Figure 19 - Transit Mode Share - Facility**

Figure 19 shows that transit mode share for the whole facility has remained relatively consistent at around 4 percent within the northbound PM peak period from 2002 to 2009. The facility transit mode share at the more southern location of NW 79<sup>th</sup> St is generally higher, measured at around 6.5 percent in 2008. The one transit mode share value measured in 2009 (northbound south of Golden Glades) is almost the same as its 2008 equivalent (3.6% versus 3.5%), again illustrating that facility transit mode share has been relatively unaffected by Express Lanes implementation. It is feasible that mode shift to transit is being constrained by full utilization of parking capacity at Golden Glades Interchange.

## 7 Transit User Perceptions

In May 2008, a baseline survey was conducted prior to implementation of Phase 1A. The survey collected demographic characteristics and travel behavior of the transit users that were using the corridor, user opinions on different aspects of the current transit service, and the factors that influence their mode choice decisions. In May 2009, a second “after” survey was conducted to assess the impacts of Phase 1A on transit user perceptions. These two survey instruments are provided in Appendix II. This chapter presents the 2009 survey findings with comparisons to the 2008 survey baseline data.

### 7.1 Survey Methodology

Table 15 summarizes the characteristics of the 2008 and 2009 survey samples.

**TABLE 15 - Survey Response Summary**

Survey	Day/Period	Direction	Surveys Collected	Passenger Counts	Response Rate (%)
2008 Pre-Deployment	5/27; 6–9 am	S/B	266	1318*	20.2
	5/28; 6–9 am	S/B	213	1483*	14.4
	5/29; 4–6 pm	N/B	93	387**	24.0
<b>TOTAL</b>			<b>572</b>	<b>3188</b>	<b>17.9</b>
2009 Post-Deployment	5/13; 3-6 PM	N/B	277	414	66.9
	5/14; 3-6 PM	N/B	72	110	65.5
<b>TOTAL</b>			<b>349</b>	<b>524</b>	<b>66.6</b>

\* Passenger counts are for all 95 Express runs within the specified Day/Period/Direction

\*\* MDT staff expressed concern that the passenger count on 5/29 appeared low and could be in error

In both surveys, passengers were surveyed on the trunk section of the 95 Express route between downtown Miami and Golden Glades Interchange. Comparing the two surveys, it can be seen that the 2008 survey has a larger overall sample size, primarily due to being conducted over three days instead of two. The large disparity in response rates between the two surveys is due to the fact that passenger counts for the 2009 survey were conducted only on bus runs where surveys were distributed, while in the 2008 survey the passenger counts shown are for all runs completed during the surveyed period (as passenger counts on individual bus runs were not conducted). This also explains why the passenger counts were much higher in 2008, and thus response rates were much lower.

Expansion factors (typically used to correct for variation in levels of non-response on individual bus runs) were not applied to either dataset due to passenger counts not being collected on individual runs in 2008. However, sensitivity testing using the 2009 dataset, where individual run count data were collected, showed that the application of expansion factors had a negligible impact on the survey results. Therefore, while we would have preferred to apply expansion factors to both datasets, we are confident that not doing so does not have a significant impact on the comparability of the two surveys.

The other comparability issue is that the majority of 2008 survey respondents were surveyed in the southbound direction in the AM peak period, while all 2009 survey respondents were surveyed in the northbound direction in the PM peak period. While this significant difference in sampling limits the use of the complete 2008 dataset for any sort of travel behavioral comparison, the fact that the vast majority of 95 Express users ride the service in both directions each day (87 percent of the 2009 sample) means that the data is still useful for assessing changes in user perceptions of the service. Where appropriate, 2009 survey responses were compared against those of 2008 northbound sample only.

## 7.2 Sample Characteristics

### 7.2.1 Socio-Economic / Demographic Profiles

The demographic/socio-economic profile of the survey sample is provided in Table 16 below. For comparison purposes, the profile of the 2008 UPA survey, the profile of MDT's total ridership (from a 2005 system-wide survey), and the total population profiles of Miami-Dade and Broward Counties, are also provided using information from the 2000 census.

**Table 16 Comparison of Sample and Population Demographics**

Demographic Variable	Categories	2009 UPA 95X Survey	2008 UPA 95X Survey	2005 MDT Survey (286 routes)	County Population (Census 2000)	
					Broward	Miami- Dade
N. (Population / Sample Size)		349	572	26,990	1,623,018	2,253,362
Age	Under 18	1.0%	1.2%	Different categories used	23.6%	24.8%
	18 to 24	3.7%	6.2%		7.2%	9.1%
	25 to 34	16.1%	15.8%		14.2%	15.0%
	35 to 49	44.3%	40.9%		24.3%	22.8%
	50 to 64	30.9%	33.5%		14.6%	15.0%
	65 or over	4.0%	2.3%		16.1%	13.3%
Ethnicity	Hispanic					
	- African American	0.8%	1.3%		0.7%	1.7%
	- White	7.1%	7.8%	50.0%	13.0%	49.2%
	- Other	1.1%	2.5%		3.6%	6.7%
	Non-Hispanic					
	- African American	69.5%	67.6%	31.0%	20.8%	19.1%
- White	10.9%	12.4%	10.0%	57.0%	20.4%	
- Other	10.5%	8.4%	10.0%	5.0%	2.9%	
Gender	Female	75.4%	80.3%	54.0%	51.7%	51.7%
	Male	24.6%	19.7%	46.0%	48.3%	48.3%
Annual Household Income*	Less than \$20,000	7.4%	7.8%	71.0%	22.0%	28.5%
	\$20,000 to \$29,999	12.0%	12.8%	13.0%	13.3%	14.0%
	\$30,000 to \$39,999	20.4%	17.0%	8.0%	12.3%	12.1%
	\$40,000 to \$59,999	32.7%	27.2%	5.0%	19.3%	17.8%
	\$60,000 or more	27.5%	35.2%	4.0%	33.0%	27.7%

\*Income figures are indicative only because (a) data has not been adjusted to account for inflation between 2000, 2005, and 2008, and 2009, and (b) because Census 2000 income data was collected at the household level, not at the person level.

Table 16 shows that the demographic profile of the 2009 survey sample is generally comparable to that of the 2008 survey sample. As in 2008, the 2009 sample shows that 95 Express users are predominantly African-American, female, and of working age. This is quite different to the demographics of MDT ridership as a whole, which is 50 percent Hispanic and more evenly balanced between males and females. The household income profile of the 2009 sample is also very similar to that of the 2008 sample, again different from the much lower incomes observed among MDT's system wide ridership (71% under \$20,000), and more comparable to that of the general population of Miami-Dade and Broward counties. Overall, the high correlation between the demographic profiles of the 2008 and 2009 samples provide confidence in the comparability of the two surveys.

## 7.2.2 Private Vehicle Availability

Given the focus of the UPA project on traffic congestion reduction and mode shift, a series of questions were asked regarding 95 Express users' level of access to a private vehicle. Responses are summarized in Table 16 below, along with the corresponding information from the 2005 MDT system wide survey and the 2008 UPA survey.

**Table 17 Vehicle Availability**

Question	Category	2009 UPA 95X Survey	2008 UPA 95X Survey	2008 UPA 95X Survey (Northbound)	2005 MDT Survey (286 routes)
N. (Population / Sample Size)		349	572	93	26,990
Car/Vehicle Available for this Trip	Yes	66.8%	80.0%	70.4%	
	No	33.2%	20.0%	29.6%	
Number of household vehicles	0	10.5%	7.6%	11.1%	32%
	1	40.6%	35.7%	32.2%	50%
	2	36.5%	39.7%	38.9%	13%
	3	10.5%	12.6%	12.2%	
	4	1.5%	3.9%	5.6%	5%
	5 or more	0.3%	0.6%	0.0%	
Level of access to a car/motor vehicle for personal use	Always	65.3%	79.1%	77.8%	
	Most of the time	16.7%	10.4%	10.0%	
	Occasionally	9.9%	5.3%	3.3%	
	Never	8.0%	3.8%	5.6%	
	Don't know	-	1.5%	3.3%	

With the 2009 survey sample again generally correlated with the 2008 survey sample, Table 17 shows that the majority of riders, 66.8 percent, have access to a car for their northbound trip on the 95 Express. This percentage is somewhat lower than the 80 percent figure observed in the 2008 survey, but correlates closely with the 70.4 percent figure calculated from the northbound sample of 2008 survey respondents. Overall, it appears that private vehicle availability is slightly lower for trips in the northbound direction, though its also possible that the economic recession may have negatively impacted the level of access to private autos.

## 7.3 Characteristics of Current 95 Express Service Usage

### 7.3.1 Main Reasons for Riding the 95 Express

Respondents were asked “What is the main reason that you are riding the 95 Express today?” Seven response options were provided, in addition to a self-completion “other” category.

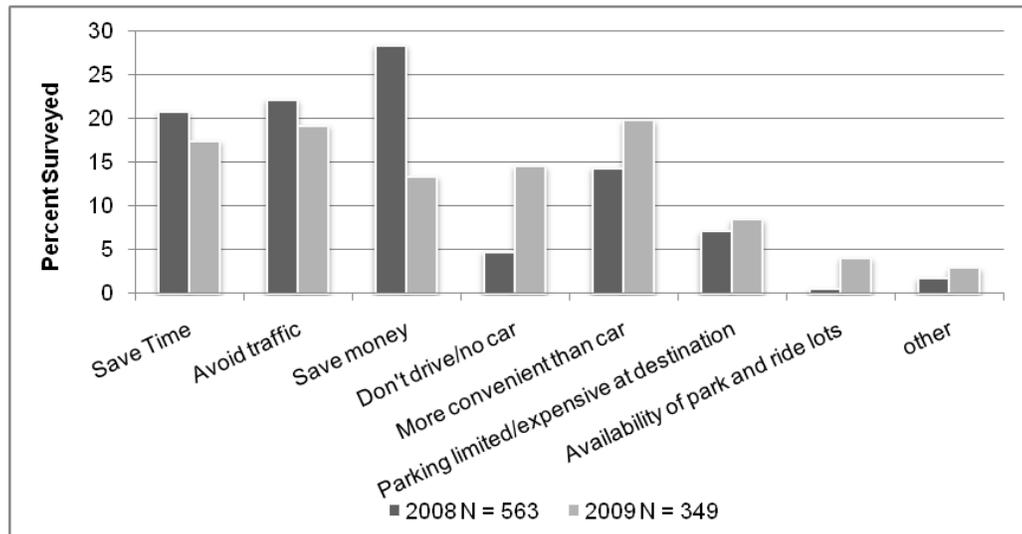


Figure 20 Main reason for riding the 95 Express

Figure 20 shows some disparity between the 2008 and 2009 responses. In 2008, the most popular reason was “save money” accounting for 28.4 percent of responses. In 2009, “save money” accounted for only 13.4 percent of responses. This difference reflects the fact that since May 2008 gas prices dropped significantly while MDT fares rose significantly, reducing the fiscal advantage of transit use over private auto use. Also, a larger proportion of respondents indicated that their main reason for using the 95 Express service was that they did not own a car or drive. This again reflects a lower level of private vehicle availability in the northbound direction. This is because the questionnaire response category was not clear on whether lack of car availability referred to that particular trip or in general. Thus, people could still legitimately answer ‘don’t drive/no car’ in relation to their northbound return trip. Overall, the 2009 survey responses to this question show that, with the money saving aspects of the 95 Express service somewhat diminished, travel time, traffic avoidance, and convenience relative to the private auto have become the most popular reasons for using the service.

### 7.3.2 Origins and Destinations of 95 Express Users

Respondents were asked to provide the location of their trip origin and destination, via a zip code or community name. Responses are summarized in two figures provided in Appendix III, one showing origins and one showing destinations. Some of the responses are illogical, showing origins north of Golden Glades and destinations south of downtown Miami. As with the 2008 survey, this is due to the fact that some respondents appear to have assumed that the origin of their trip was their home location, not where they started their PM peak bus journey.

Figure III-1 (Appendix III) shows trip origins, with concentrations of origins around downtown Miami and Golden Glades Interchange, along with origins over a wide area of northern Miami-Dade and southern Broward counties. Figure III-2 (Appendix III) shows trip destinations. The figure shows a cluster of northbound destinations in the area around Golden Glades, but with generally dispersed destinations over much of northern Miami-Dade and southern Broward counties.

Overall, the series of figures that indicate that, as with the 2008 survey, most northbound 95 Express trips originate downtown Miami and terminate in north Miami-Dade County / south Broward County area, in relatively close proximity to Golden Glades Interchange.

### 7.3.3 Mode of Access To and From the 95 Express

Respondents were asked to provide their mode of access to and from the 95 Express bus service. Responses are provided in Figures 21 and 22. Results from the 2008 UPA survey are included for comparison, although only the northbound direction is included to match the circumstances of the 2009 survey.

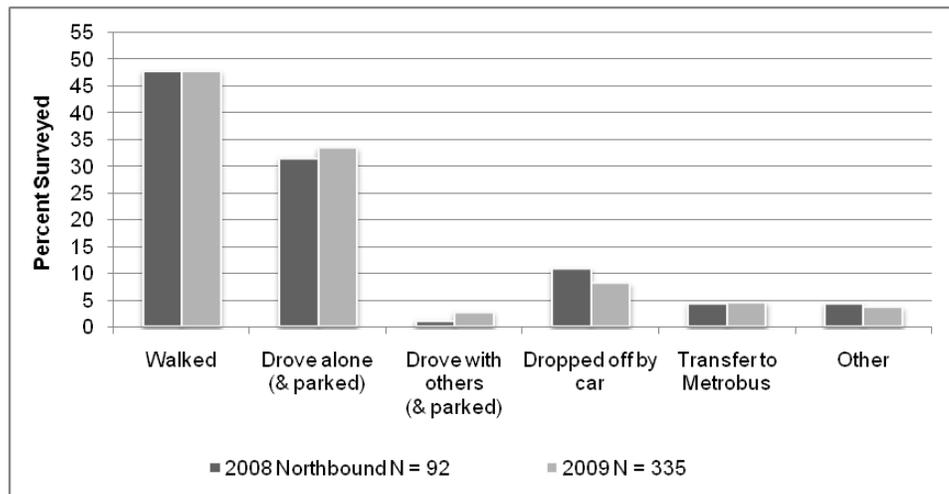


Figure 21 Mode of Access to 95 Express Bus

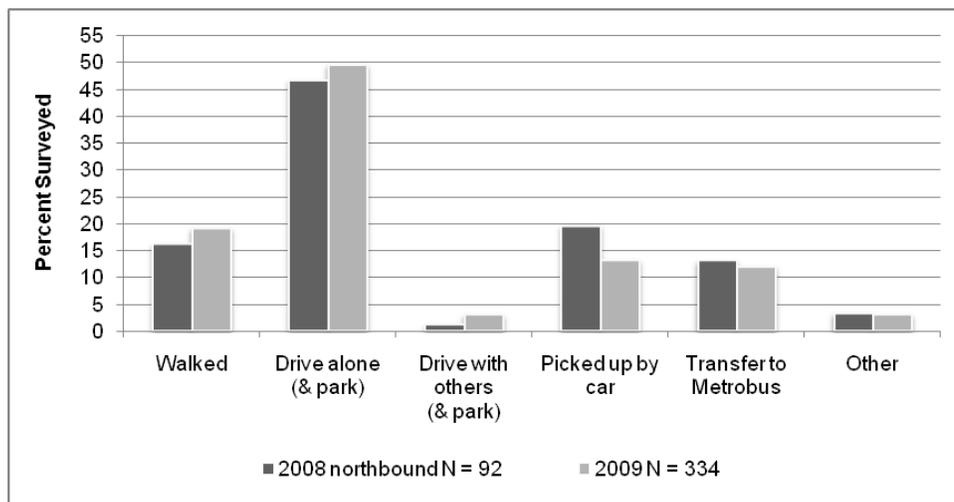


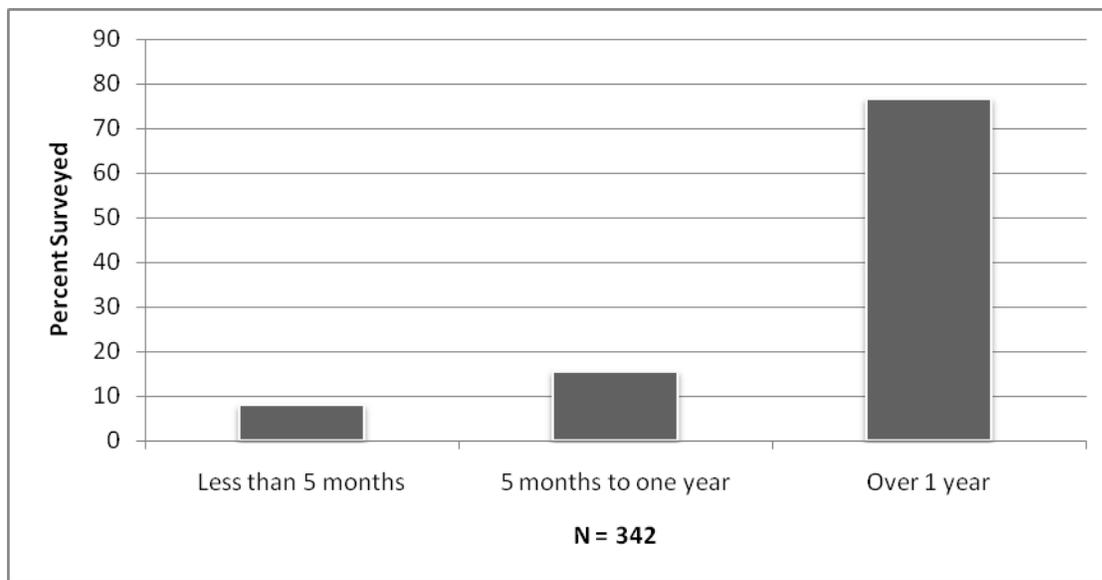
Figure 22 Mode of Egress from 95 Express Bus

Figures 21 and 22 show that almost half the 95 Express bus ridership walked to access the northbound 95 Express service, while around one third drove alone and parked near the service. At the end of the northbound trip, almost half the 95 Express bus users drove alone to their final destination, with the remainder either walking, being picked up by car, or transferring to other bus routes. Again, there is a high correlation between 2008 and 2009 samples.

Riders with walking elements to their trip were asked how many blocks they walked. The average number of blocks walked to the 95 Express bus was 1.89 (118 respondents). The average number of blocks walked from the 95 Express bus to the final destination is 1.85 (44 respondents).

### 7.3.4 Length of Service Use

Respondents were asked to report “how long have you been riding the 95 Express bus service?” The five month time period was specified in order to determine whether respondents had been riding prior to the opening of the Express Lanes on December 5, 2008.

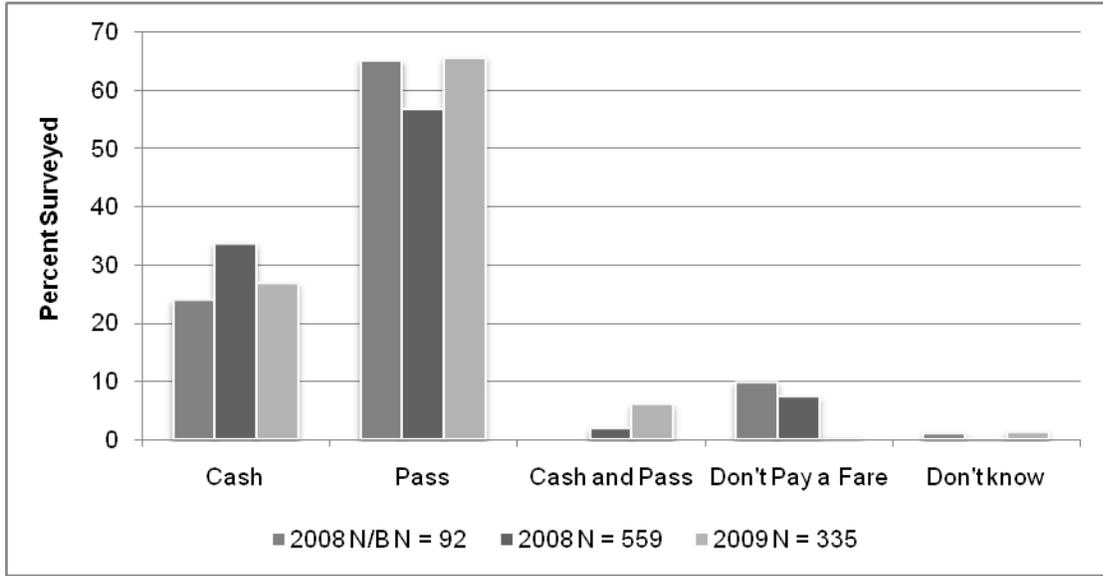


**Figure 23 Length of use of the 95 Express bus**

Figure 23 shows that almost all respondents (92.1 percent) reported that they have been using the 95 Express bus for over five months, with 76.6 percent riding for over one year. This means that almost all respondents were riding the service before the Express Lanes were opened in December 2008.

### 7.3.5 Fare Payment

Respondents were asked for their method of fare payment. Multiple responses were permitted to account for multiple leg journeys. The results are given in Figure 24.



**Figure 24 Fare payment methods**

Pass users in 2009 accounted for approximately 65.7 percent of all fares, up from approximately 56.5 percent in 2008. Cash type fares dropped from 33.4 percent of fares to 26.9 percent. It is possible that the increase in the cash fare made a monthly pass more attractive, though the monthly pass cost also increased significantly, as shown in Table 18 below.

**Table 18 Trip Costs**

	Pre 10/2008	Post 10/2008	% Change
Express Bus One-Way fare	\$1.85	\$2.35	27.0%
Monthly Metropass	\$75.00	\$100.00	33.3%
Average trip cost (cash)	\$2.19	\$2.83	29.2%
Average trip cost (pass)	\$1.81	\$2.58	42.4%

Respondents were asked to provide the total cost of their trip, including transit transfer fees and any other incurred costs. The average cost of a one way trip for cash fare payers was \$2.83 (65 respondents) up by an average of 29.2 percent in comparison to 2008. Many respondents reported a total cash fare of \$2.85 which is most likely due to the additional \$0.50 bus to bus and rail to bus transfer fee. The average cost of a pass used is \$85.67 with 101 respondents answering this question, although the most frequent answer was \$100. Assuming a similar frequency of use to 2008, the average cost per trip for pass users is \$2.58, up by an average of 42.5 percent in comparison to 2008. Respondents were asked to indicate whether or not an employer paid any/all of the bus fare, 40.8 percent answered yes. Less than one percent of respondents claimed not to pay a fare, down from seven percent in 2008.

Free use of MDT services is extended to the following groups:

- Miami Dade residents 65 years and older who are Social Security beneficiaries are eligible for free transit use through the Golden Passport program.
- Veterans who earn less than \$22,000 per year are eligible for the Patriot Passport
- Disabled persons who register with the Special Transportation Service and have an STS or ADA identification permit. Persons in wheelchairs do not pay a fare and do not have to show the STS/ADA permit.

### 7.3.6 Total Travel Time

Respondents were asked to provide their typical door-to-door travel time. Responses were divided into four categories as shown. The 2009 sample is compared with the 2008 northbound sample only. The results are provided in Figure 25.

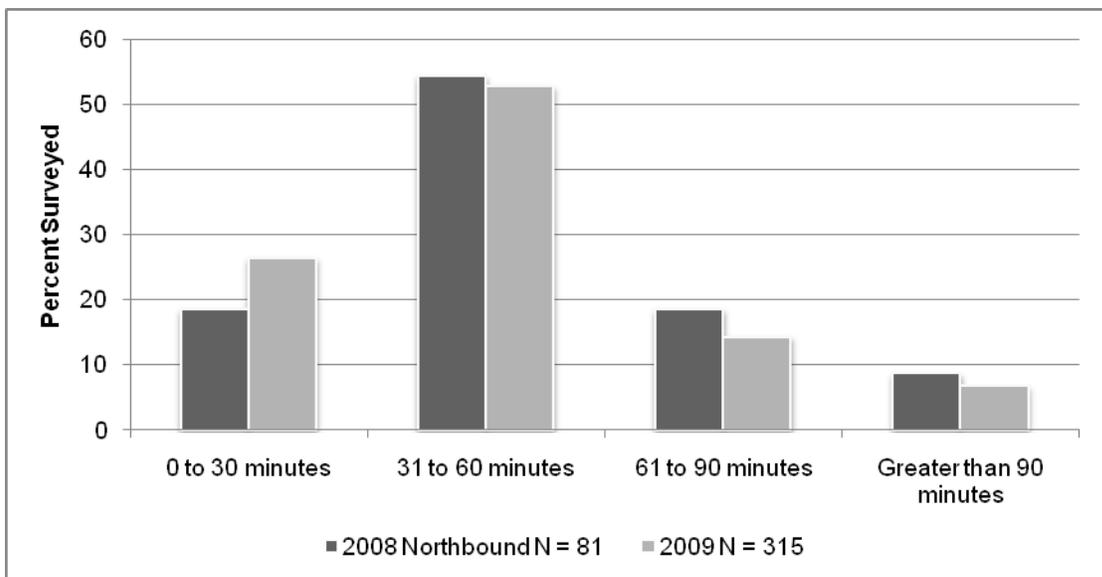


Figure 25 Typical total travel time

Figure 25 shows that the majority of riders still take under an hour from door-to-door to complete their trip in each direction, though the proportion taking less than 30 minutes is slightly higher in the 2009 sample. The average perceived door to door trip time in the northbound direction in 2009 was 52.8 minutes, compared to 55.2 minutes in 2008, a reduction of 2.4 minutes. This difference was not found to be statistically significant at the 95 percent confidence level.

## 7.4 User Perceptions of the 95 Express Service

This section of the questionnaire was designed specifically to assess whether user perceptions of the 95 Express service had changed since the 2008 survey, and then to determine the extent to which any observed changes were due to Express Lanes implementation.

## 7.4.1 95 Express Bus Service Element Ratings

### *Comparison to 2008 Survey*

Respondents were asked to rate ten aspects of the current 95 Express bus service on a scale of 1 (very poor) to 5 (very good), and then to provide ratings for the 95 Express bus service and Metrobus (Miami Dade Transit)/Broward County Transit (BCT) service in general. Table 6 provides the mean rating achieved in each case for the 2009 total sample, 2008 total sample, and 2008 northbound sample only (to assess whether service perceptions vary by direction). Independent sample T-tests were conducted to assess the statistical significance of the differences in the calculated means. These are also provided in Table 19 below, with statistically significant elements highlighted in **bold**.

**Table 19 Elements of the 95 Express Service**

Service Element	2009 Survey Total Sample		2008 Survey Total Sample		Sig. 2009 Sample vs. 2008 Sample	2008 Survey N/B Sample		Sig. 2009 Sample vs. 2008 N/B Sample
	Mean Rating	N	Mean Rating	N		Mean Rating	N	
<b>Travel Time</b>	<b>4.28</b>	335	<b>4.05</b>	545	<b>0.000**</b>	<b>3.93</b>	90	<b>0.000**</b>
<b>Service Reliability (on time performance)</b>	<b>4.19</b>	338	<b>4.06</b>	559	<b>0.026*</b>	<b>3.97</b>	92	<b>0.032*</b>
Parking availability at Golden Glades***	4.00	326	N/A	N/A	N/A	N/A	N/A	N/A
Wait time at station/stop	3.83	330	3.75	552	0.224	3.75	92	0.475
Value for money of service	3.79	321	3.84	530	0.468	3.82	89	0.780
<b>Availability of seats</b>	<b>3.76</b>	329	<b>3.59</b>	556	<b>0.018*</b>	<b>3.41</b>	90	<b>0.004**</b>
Frequency of Service	3.62	331	3.51	552	0.139	3.48	88	0.269
Hours of Service	3.57	333	3.54	544	0.670	3.54	87	0.829
Overall satisfaction with the 95 Express	4.15	334	4.09	559	0.279	4.11	93	0.660
Overall satisfaction with Metrobus (MDT) / BCT service	3.85	327	3.83	507	0.699	3.89	81	0.717

\*Significant at the 95% confidence level; \*\* Significant at the 99% confidence level;  
 \*\*\* This service element was not included in the 2008 survey

Comparing the mean scores achieved by each element in 2009 with those from the total sample from 2008, it can be seen that in almost all cases the mean score has improved. Travel time received the highest overall rating (4.28), and also showed the largest increase over its 2008 average rating, which was observed to be statistically significant at the 99 percent confidence level. Service reliability and seat availability also received statistically significant rating increases. It is unclear why seat availability received a higher rating in 2009 as ridership increased during this period while service quantity decreased slightly, meaning

that seat availability would have also decreased. The only element receiving a lower rating in 2009 was “value for money of service”, though this rating difference was not statistically significant. This lower rating likely relates to the significant increase in fare and pass costs imposed in October 2008.

Overall, it appears that the opening of the Express Lanes and the associated impacts on travel times and reliability levels has improved user perceptions of what is already a highly rated service. The overall rating of the 95 Express bus service also increased from 4.09 to 4.15, while perceptions of MDT/BCT services as a whole remained at a similar level to 2008, though neither of these mean differences were statistically significant. Comparing the 2008 total sample with the 2008 northbound sample only, it can be seen that the northbound means for the individual service elements are generally lower, though the overall service ratings are slightly higher in the northbound direction. However, the 2008 northbound sample yielded the same pattern of results as the 2008 total sample when compared to the 2009 survey sample.

*Comparison to Pre-Express Lanes Service*

Respondents who had been riding the 95 Express for more than five months (when the Express Lanes were opened) (N = 268) were asked a series of questions comparing the service now with the service before the Express Lanes were opened. The first of this series of questions asked respondents to rate four core aspects of the 95 Express bus service pre and post Express Lanes deployment, as shown in Table 20.

**Table 20 Comparison of Selected Service Elements to Pre-Express Lanes Implementation**

Service Element	Better now	Same now	Worse now	Don't know
Service reliability	55.3%	39.9%	2.7%	2.1%
Travel time	74.3%	21.5%	1.7%	2.4%
Value for money of service	42.6%	40.1%	11.3%	6.0%
Availability of seats	33.3%	55.1%	9.8%	1.8%
95 Express bus service overall	56.8%	39.0%	2.1%	2.1%

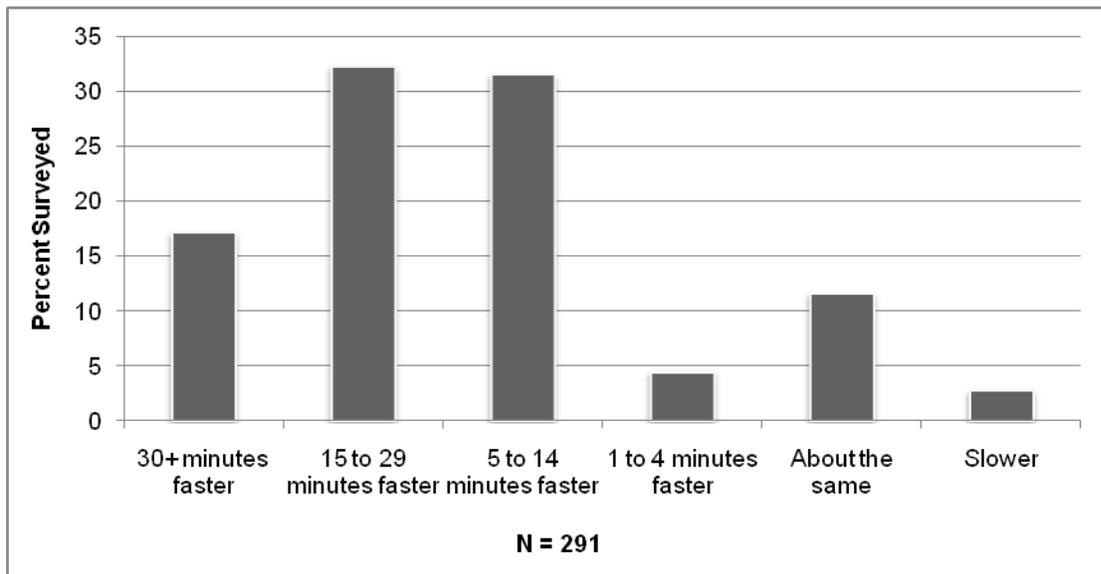
Responses summarized in Table 20 reinforce the prior finding that Express Lane implementation has improved perceptions of the 95 Express service, particularly travel time, with 74.3 percent rating this as better than pre-Express Lanes. It is interesting that 42.6 percent indicated that value for money of service had also increased. For these people, it appears that the travel time and reliability benefits of Express Lanes implementation has more than offset the significant increase in fares and monthly pass costs, as well as the lower gas prices. Respondents were then asked to provide details on how the 95 Express bus service has changed for better or worse since the Express Lanes were opened in December 2008. The categorized results are in Table 21.

**Table 21 How has the 95X changed since the Express Lanes opened?**

Comment	N = 117
Faster service	52
Better Service (non specific)	31
Faster northbound, need southbound lanes opened	11
Faster if no accidents on lane	7
Dislike fare increase	5
More reliable service	4
Service is the same	4
Need extended hours	3
Faster depending on traffic	1
Traffic congestion when initially entering HOV lane	1
Need to extend service to weekend	1
Less reliable to Aventura	1

Fifty-two of the 117 comments related to the 95 Express service being faster now, specifically in the northbound direction since the opening of the Express Lanes, while the next most common response (31 comments) was simply that the service was better. Eleven comments specifically addressed the need for southbound Express Lanes to match the service increase in the northbound direction.

Focusing on the issue of the travel time impact of Express Lanes implementation on the northbound 95 Express bus service, respondents that had used the service prior to Express Lane implementation were asked to indicate how much their travel time on the 95 Express bus had changed.



**Figure 26 Travel time comparisons with pre-December 2008 implementation**

With 291 responses to this question, 85.6 percent felt that there was a travel time decrease. A majority of respondents (63.9 percent) perceived 5 to 29 minute decrease in travel time.

## 7.4.2 Additional Comments

On both the 2008 and 2009 surveys, respondents were asked if they had any other comments on the 95 Express bus service, the local transit system, or transportation in general. Responses were categorized and compared to those received in the 2008 survey, as summarized in Table 22.

**Table 22 Additional Comments**

Category	Comment	2008 Survey (N = 199)	2009 Survey (N = 131)
Service	Service is good	13	18
	Unreliable service	6	6
	Extend service hours	15	18
	Need more frequent service	54	20
	Need more stops / Need specific stops	16	3
	Don't reduce schedule	2	2
	Station / Stop unsafe	3	0
	Too much congestion on road / 95 Express needs its own lane.	9	1
	More Trains/Rail	3	3
	Public transportation needs more funding	1	0
	Keep 95 Express running	9	1
	Improve Golden Glades station	1	2
	Extend service to weekend	3	3
Not enough parking	3	4	
Customer Service/ Information	Need better/more access to service information/Bus ID/routes	4	4
	Need better customer service	1	0
	Need better disabled care	1	1
Vehicles	Buses are dirty (unhealthy)	10	16
	Need new buses	2	1
	Problems with air conditioning	3	2
	Uncomfortable seats	1	0
	Lack of seat availability	7	3
	Bus needs better ride quality	1	0
Fare	Don't raise the fare	12	2
	Give student passes to all students	2	0
	Poor value for the money	1	7
	Lower fare	2	6
	Make 95 Express free	1	0
	Let Broward riders use the MDT passes	2	0
Give county employees discount	1	0	
Driver	Drivers are courteous	5	18
	Drivers are rude	3	0
	Driver criticism (non-specific)	5	2

The most frequently cited suggestion was the need for more frequent service (20 comments), extended hours (18 comments), and the need for cleaner buses (16 comments), which were also three of the most commented categories in 2008. The need for a lower fare, or a feeling of poor value for the money spent was also expressed (13 comments). While nine comments were received in 2008 on the need for a dedicated lane for the 95 Express bus, only 1 comment to this effect was received in 2009.

## 7.5 Impacts of Express Lanes on Transit Mode Share/Shift

Several questions within the 2009 questionnaire were designed specifically to determine whether there was any mode shift to transit as a result of Express Lanes implementation. Respondents were asked to indicate how they made this trip prior to riding the 95 Express bus service. Their responses were cross-tabulated against the length of time they had been using the 95 Express service, in order to isolate those who had switched to using the 95 Express following Express Lanes implementation in December 2008. See Table 23 for results.

**Table 23 How long have you been riding the 95 Express bus vs. previous mode**

How did you make this trip prior to riding the 95 Express bus?	How long have you been riding the 95 Express bus?							
	Less than 5 months		5 - 12 months		Over 1 year		Total	
	N	%	N	%	N	%	N	%
Travelled alone by car	13	48.1%	26	51.0%	128	50.0%	167	50.0%
Carpooled in HOV lane	0	0.0%	3	5.9%	11	4.3%	14	4.2%
Used other bus service	2	7.4%	5	9.8%	20	7.8%	27	8.1%
Used other transit service	2	7.4%	8	15.7%	21	8.2%	31	9.3%
Did not make this trip	9	33.3%	3	5.9%	15	5.9%	27	8.1%
Have always used the 95 Express bus	1	3.7%	6	11.8%	56	21.9%	63	18.9%
Other	0	0.0%	0	0.0%	5	2.0%	5	1.5%
<b>Total</b>	<b>27</b>	<b>100%</b>	<b>51</b>	<b>100%</b>	<b>256</b>	<b>100%</b>	<b>334</b>	<b>100%</b>

The first point to note from Table 23 is that very few respondents (27) had been riding the service for less than 5 months. This in itself shows that 95 Express ridership consists primarily of people who have been using the service prior to Express Lanes implementation, and therefore their core decision about whether or not to use transit on the corridor must be assumed to be unaffected by the project. Secondly, there are so few respondents riding for less than five months that this sample size (27 responses) is insufficient for the purposes of making any statistically robust inferences about mode shift to transit, though it can be seen that the most frequently cited responses within this group were 'travelled alone by car' (13 respondents) and 'did not make this trip' (nine respondents). However, 50 percent of the total sample stated that their prior travel mode for the trip was travelling alone by car, with this proportion being approximately the same whether respondents had been riding for less

than five months, five to twelve months, or over one year. This suggests that the 95 Express service as a whole has had some success over time in attracting auto users to transit, and that the rate at which private auto users switch to the 95 Express has not been affected by Express Lanes implementation.

It is also important to note that only 4.2 percent of current users indicated that they used to carpool in the HOV lanes, and that none of those riding for less than five months had previously carpooled. This indicates that current 95 Express users are generally not prior carpoolers, and that changing the eligibility requirement to use the Express Lanes from 2+ to registered 3+ has not induced prior carpoolers to switch to transit.

One further question asked respondents to indicate whether or not the opening of the Express Lanes had influenced their decision to ride the 95 Express bus service. Table 24 below shows the results, again, cross-tabulated by length of time using the service.

**Table 24 Did the opening of the I-95 Express lanes influence your decision to ride the 95X bus**

Did the opening of the I-95 Express Lanes influence your decision to ride the 95 Express bus?	How long have you been riding the 95 Express bus?							
	Less than 5 months		5 - 12 months		Over 1 year		Total	
	N	%	N	%	N	%	N	%
Yes	4	14.8%	12	22.6%	40	15.3%	56	16.4%
No	5	18.5%	23	43.4%	173	66.0%	201	58.8%
No Response	18	66.7%	18	34.0%	49	18.7%	85	24.9%
Total	27	100%	53	100%	262	100%	342	100%

Table 24 shows that of the users who responded to this question, only 9 users indicated that they have used the 95 Express bus fewer than five months, with four of these users indicating that the opening of the Express Lanes influenced their decision to ride the 95 Express bus. Of the 315 users who had been riding the service before the northbound Express Lanes were opened (for between 5 and 12 months or for more than a year), 52 stated that it had had an impact on their decision. This could mean that these riders are likely either riding the 95 Express bus more frequently, or have decided to continue using the service while otherwise they would have shifted to other modes. Thus, a total of 56 people, or 16.4 percent of those that answered the question, stated that their decision to ride was influenced by the Express Lanes project.

Those indicating that the Express Lanes had influenced their decision were asked to provide comments on how their decision was influenced. Only 22 responses were recorded and the majority of those cited time savings from the Express Lanes as the reason their decision was influenced.

## **8 Conclusions**

### **8.1 Transit Service Performance Impacts**

Express Lanes (Miami Phase 1A) implementation has had a significant impact on the northbound travel times of 95 Express bus routes between downtown Miami and Golden Glades Interchange, with travel times on this 7.5 mile section decreasing from 25 minutes to 8 minutes on average. This has allowed Miami-Dade Transit to decrease scheduled northbound travel times from downtown Miami to Golden Glades Interchange from 32 to 22 minutes, now 10 minutes quicker than before and 10 minutes quicker than in the opposite direction. Service reliability, measured in terms of on-time performance, has remained unchanged although it was not possible to isolate the northbound direction only in the calculation of this metric. Service quantity on the 95 Express service, measured in terms of revenue miles, has decreased slightly by 7.0 percent while corridor bus service quantity decreased by 4.2 percent, the result of systemwide service cuts due to budget constraints. Parking capacity at Golden Glades Interchange has been fully utilized since summer 2008.

### **8.2 Transit Service Usage Impacts**

Bi-directional ridership on the 95 Express bus service increased by 30 percent when comparing the first three months of 2009 with the same period of the previous year, with a significant increase coinciding with Express Lanes implementation in December 2008. This represents a significant increase in productivity of 40 percent, measured in terms of boardings per revenue mile. At the corridor level however, bus ridership actually dropped by 4.6 percent, with corridor level boardings per revenue mile remaining unchanged. This is likely due to small systemwide reductions in service quantity and significant fare increases, coupled with exogenous factors like lower gas prices and economic recession, plus the fact that the 95 Express accounts for less than one fifth of total corridor ridership. The higher income profile of express bus users is one reason why the fare increase has not impacted 95 Express ridership in the same way in which it has impacted the MDT system as a whole.

Data from FDOT's I-95 Lane Monitoring Reports were used to assess the impacts of Express Lanes implementation on transit person throughput and mode share. Transit person throughput was measured at 1.4 percent higher in 2009 compared to 2008. While the sampled transit person throughput remained approximately the same, SOV person throughput increased dramatically due to SOVs being permitted to legally use the managed lanes. The net effect of this was that transit mode share in the managed lanes decreased from 15 percent in 2008 to 12.3 percent in 2009, while transit mode share for the facility as a whole remained unchanged at around 3.5 percent. Mode shift to transit may be constrained by the lack of parking capacity at Golden Glades Interchange.

### **8.3 Transit User Perceptions**

Though the 95 Express bus service is already highly rated, Express Lanes implementation has further improved customer satisfaction, with statistically significant increases in perceptions of travel time and service reliability (as well as seat availability). The only element receiving a lower rating in 2009 was "value for money of service", though the rating

difference was not statistically significant. This lower rating likely relates to the significant increase in fare and pass costs imposed in October 2008.

Several questions were included in the 2009 survey to assess potential mode shift resulting from Express Lanes implementation. It was found that almost all surveyed users (92%) had been riding the service before the Express Lanes were implemented, suggesting negligible mode shift due to Express Lanes. However, 50 percent of the total sample stated that their prior mode for the trip was travelling alone by car, which suggests that the 95 Express bus service in general has had some success over time in attracting private auto users. The rate at which private auto users have been attracted to the 95 Express service has remained relatively unchanged over time, providing further evidence that mode shift to transit due to Express Lanes has been negligible. It was also observed that only 4.2 percent of all surveyed users indicated that they previously carpoolled in the HOV lanes, with no prior carpoolers among those that began using the service after Express Lanes implementation. This indicates that current 95 Express users are generally not prior carpoolers, and that changing the eligibility requirement to use the Express Lanes from unregistered 2+ to registered 3+ has not induced prior carpoolers to switch to transit.

## **8.4 Context of Phase 1A Transit Impacts**

Overall this analysis has shown that Express Lanes implementation has had a positive impact on the transit services that use I-95, significantly improving northbound travel times between downtown Miami and Golden Glades Interchange, as well as improving user perceptions of an already highly rated service. While these improvements in performance appear to have induced a significant increase in ridership on the transit services using I-95, this has not translated into corridor level ridership gains. This is likely due to systemwide service cuts and fare increases, coupled with exogenous factors like low gasoline prices and economic recession, plus the fact that the 95 Express accounts for less than one fifth of total corridor ridership. Within this context, the ridership gains observed on the 95 Express bus service are even more impressive, though transit mode share on the Express Lanes has actually reduced slightly due to a significant increase in the number of SOVs on the facility. Finally, it should be noted that most 95 Express users are commuters on daily round trips, and as such still have to endure high levels of traffic congestion in the southbound direction. Thus, the competitiveness of the 95 Express bus service as a round trip commute mode versus the private auto cannot be fully realized until the southbound direction is similarly improved under Phase 1B of the project.

## **8.5 National Evaluation Hypotheses**

The table on the next page summarizes the main conclusions of this report and relates them to the overarching hypotheses posed in the National Evaluation Framework document.

**Table 25 – Conclusions Summary in Relation to NEF Hypotheses/Questions**

Hypothesis/ Question	Measures of Effectiveness	Conclusion
The UPA project will enhance transit performance in the UPA/CRD corridors (through reduced travel times, increased reliability, increased capacity, etc.)	<ul style="list-style-type: none"> <li>– Travel times have decreased significantly from 25 mins in 2008 to 8 mins in 2009 on the northbound Express Lanes between downtown Miami and Golden Glades Interchange</li> <li>– Two-way reliability levels (measured in terms of on-time performance) have remained unchanged</li> <li>– Statistically significant improvements were observed in transit user perceptions of travel time and reliability</li> <li>– Transit service quantity (revenue miles) for the 95X decreased by 7% and corridor bus service quantity decreased by 4.2%</li> <li>– Parking capacity at Golden Glades Interchange is fully utilized</li> </ul>	<ul style="list-style-type: none"> <li>– The Express Lanes have significantly decreased northbound transit travel times between downtown Miami and Golden Glades Interchange</li> <li>– Customer perceptions of travel time and reliability on this section of I-95 have improved significantly.</li> <li>– Parking capacity constraints at Golden Glades Interchange is likely to be restricting potential growth in corridor ridership</li> </ul>
The UPA project will increase ridership and facilitate a mode shift to transit.	<ul style="list-style-type: none"> <li>– 95X ridership has increased by 30%</li> <li>– Corridor bus ridership decreased by 4.6%</li> <li>– Systemwide MDT ridership decreased by 5%</li> <li>– Boardings per revenue mile on the 95X have increased by 40% showing a significant increase in productivity</li> <li>– Net corridor boardings per revenue mile have remained constant</li> <li>– Average vehicle occupancies on the Express Lanes and on the facility as a whole have decreased due to significant increases in SOV volumes</li> <li>– Transit mode share within the managed lanes decreased from 15% to 12.3% between 2008 and 2009</li> <li>– Transit mode share for the whole facility has remained relatively consistent (3.6% in 2008 and 3.5% in 2009)</li> </ul>	<ul style="list-style-type: none"> <li>– 95X ridership has increased significantly due to Express Lanes, but this has not impacted corridor level ridership, which has decreased slightly due to exogenous factors coupled with a slight reduction in corridor service quantity and a significant increase in fares</li> <li>– Express Lanes introduction has slightly decreased transit mode share within the Express Lanes due to the significant increase in SOVs within these lanes</li> <li>– Facility level transit mode share has remained unaffected by opening of Express Lanes</li> </ul>
Mode shift to transit/increased ridership will contribute to congestion mitigation	<ul style="list-style-type: none"> <li>– Transit mode share for the whole facility has remained relatively consistent (3.6% in 2008 and 3.5% in 2009)</li> <li>– Express Lanes have reduced traffic congestion between SR 112 and NW 125<sup>th</sup> St, with PM Peak LOS improving from LOS F in 2008 to LOS C in 2009*.</li> </ul>	<ul style="list-style-type: none"> <li>– While traffic congestion has been reduced, transit mode share has not changed and therefore transit has not contributed to the observed reduction in traffic congestion</li> </ul>
What was the contribution of each UPA project element to increased ridership and/or mode shift to transit?	<ul style="list-style-type: none"> <li>– Travel times have decreased significantly from 25 mins in 2008 to 8 mins in 2009</li> <li>– 95X ridership has increased by 30%</li> <li>– Transit mode share for the whole facility has remained relatively consistent (3.6% in 2008 and 3.5% in 2009)</li> </ul>	<ul style="list-style-type: none"> <li>– Improved travel times on the northbound Express Lanes have resulted in significant increases in route level ridership, but this has not impacted transit mode share.</li> </ul>

\* Florida Department of Transportation. (2009). *95 Express Managed Lanes Monitoring Report – Phase 1A*. Kimley-Horn & Associates.

## Appendix I – Master Transit Evaluation Matrix

Transit Improvement	Mechanisms for Congestion Reduction/Hypotheses	Indicators	Measures	Data Source / Agency	NBRTI Action Items
<b>New transit services in HOT Lanes</b>	Transit in HOT lanes will create a virtual bus way, which increases transit travel speeds and improves reliability, thereby increasing passenger throughput on the facility.	<b>Travel Time</b>	Max/Min Travel Time Minutes per mile Average Dwell time, signal delay time, Pull-out time Door-to-Door Travel Time	Travel Time Comp. Analysis  or:	<ul style="list-style-type: none"> <li>– Assist in developing data collection methodology</li> <li>– Conduct data analysis and reporting</li> </ul>
		<b>Reliability/Schedule Adherence</b>	Running time reliability On-time performance	AVL data (MDT/BCT)	<ul style="list-style-type: none"> <li>– Assist in data mining</li> <li>– Check data for quality, quantity, and format.</li> <li>– Conduct data analysis and reporting</li> </ul>
<b>New transit services in General Purpose lanes</b>	Improved transit network coverage will enhance area-wide access to transit services and service connectivity. This is a service improvement, which ultimately will attract choice riders.	<b>Ridership</b>	Ridership change over time Boardings/deboardings by stop Ridership by route segment Passenger trip length Linked and unlinked trips	Ridecheck (MDT/BCT) APCs (MDT/BCT)	<ul style="list-style-type: none"> <li>– Assist in data mining</li> <li>– Check data for quality, quantity, and format.</li> <li>– Conduct data analysis and reporting</li> </ul>
		<b>Mode shift</b>	Mode access (captive/choice) Mode use history  Average vehicle occupancies and traffic volumes in HOT lanes and GP lanes	On-Board Survey  Traffic Man. Center (FDOT)	<ul style="list-style-type: none"> <li>– Assist in developing data collection methodology</li> <li>– Conduct data analysis and reporting</li> <li>– Assist in data mining</li> <li>– Check data for quality, quantity, and format.</li> <li>– Conduct data analysis and reporting</li> </ul>
		<b>Safety/security</b>	Transit incidents / accidents  Perceptions of safety	Safety data (MDT/BCT)  On-Board Survey	<ul style="list-style-type: none"> <li>– Assist in data mining</li> <li>– Check data for quality, quantity, and format.</li> <li>– Conduct data analysis and reporting</li> <li>– Assist in developing data collection methodology</li> <li>– Conduct data analysis and reporting</li> </ul>
<b>Increases in existing transit service capacity/quality</b>	Increasing existing service can bring modal shifts, create operational impacts on associated transit corridors, and increase transit ridership during congested periods.	<b>Capacity</b>	Vehicle capacity Corridor transit service capacity Revenue hours/Revenue miles Frequency/span/days of service Level of Service information for HOT lanes and GP lanes	Ridecheck (MDT/BCT) APCs (MDT/BCT) AVL (MDT/BCT)	<ul style="list-style-type: none"> <li>– Assist in data mining</li> <li>– Check data for quality, quantity, and format.</li> <li>– Conduct data analysis and reporting</li> </ul>
		<b>Image/perception</b>	Awareness User perceptions Demographics	On-Board Survey	<ul style="list-style-type: none"> <li>– Assist in developing data collection methodology</li> <li>– Conduct data analysis and reporting</li> </ul>
		<b>Cost</b>	Capital Cost Operating cost Farebox data Cost effectiveness/efficiency	Transit cost and fare info (MDT/BCT) HOT lane / P&R lot costs info (FDOT)	<ul style="list-style-type: none"> <li>– Assist in data mining</li> <li>– Check data for quality, quantity, and format.</li> <li>– Conduct data analysis and reporting</li> </ul>

<b>Transit Improvement</b>	<b>Mechanisms for Congestion Reduction/Hypotheses</b>	<b>Indicators</b>	<b>Measures</b>	<b>Data Source</b>	<b>NBRTI Action Items</b>
<b>Park-and-Ride Capacity/Facility Improvements</b>	Increased park-and-ride capacity will attract more commuters to transit, thereby taking more vehicles off the road.	<b>Lot Utilization</b>	Lot usage/occupancy Occupancy/loading by hour/day Ridership  Awareness User perceptions demographics	Parking Lot Survey (FDOT)  On-Board Survey	<ul style="list-style-type: none"> <li>- Assist in data mining</li> <li>- Check data for quality, quantity, and format.</li> <li>- Conduct data analysis and reporting</li> <li>- Assist in developing data collection methodology</li> <li>- Conduct data analysis and reporting</li> </ul>
<b>Stationary transit infrastructure improvements (ADA enhancements, stations, shelters, depots, amenities)</b>	Depots and bus layup facilities will improve operational efficiencies. Customer amenities will improve comfort, accessibility, safety/security, and other intangible factors that are important to attracting choice riders.	<b>ADA Compliance</b>  <b>Customer Impact</b>	Station compliance (ADA) Vehicle compliance (ADA)  Awareness User perceptions demographics	Transit agency docs (MDT/BCT)  On-Board Survey	<ul style="list-style-type: none"> <li>- Obtain and synthesize transit agency docs</li> <li>- Assist in developing data collection methodology</li> <li>- Conduct data analysis and reporting</li> </ul>
<b>ITS – Bus arrival, Transit signal priority, etc.</b>	These technologies provide service quality enhancements and improve operational efficiencies, travel times, and reliability.	<b>Operational Impact</b>  <b>Customer Impact</b>	Service performance (reliability / schedule adherence)   Operating cost efficiency  Awareness User perceptions demographics	Travel Time Comp. Analysis or: AVL data (MDT/BCT)  Transit agency docs (MDT/BCT)  On-Board Survey	<ul style="list-style-type: none"> <li>- Assist in developing data collection methodology</li> <li>- Conduct data analysis and reporting</li> <li>- Assist in data mining</li> <li>- Check data for quality, quantity, and format.</li> <li>- Conduct data analysis and reporting</li> <li>- Obtain and synthesize transit agency docs</li> <li>- Assist in developing data collection methodology</li> <li>- Conduct data analysis and reporting</li> </ul>
<b>Marketing / Branding</b>	Effective marketing and attractive branding schemes will increase awareness and improve the image of public transit, broadening the appeal to commuter markets.	<b>Awareness and perception of service</b>	Awareness User perceptions Demographics	On-Board Survey	<ul style="list-style-type: none"> <li>- Assist in developing data collection methodology</li> <li>- Conduct data analysis and reporting</li> </ul>



95 EXPRESS - CUSTOMER SURVEY (la version en Español al dorso)

Survey #: 43

DEAR VALUED CUSTOMER: We would like information about your trip on the 95 EXPRESS bus to help improve the transit service. PLEASE take a few minutes to complete the following survey. Please check (x), write out, or circle your responses as appropriate. Even if you do not complete the survey, please return it to a surveyor or leave in your seat as you exit the bus. Please do not put your name or other identifying marks on the survey. THANKS FOR YOUR HELP.

YOUR TRIP ON THE 95 EXPRESS BUS SERVICE

- What is the MAIN REASON that you are riding the 95 EXPRESS bus today? (Check ONE only)
 

1__ Save time	5__ More convenient than car
2__ Avoid traffic	6__ Parking limited/expensive at destination
3__ Save money	7__ Availability of Park and Ride lots
4__ Don't drive / no car	8__ Other (specify: _____)
- Where did you start this trip? (i.e. the location of your home, work, school, etc.) (Please provide the zipcode or community name \_\_\_\_\_)
- How did you get to the bus stop for this bus trip? (Check ONE only)
 

1__ Walk (#__ blocks)	4__ Dropped off by car
2__ Drove alone (& parked)	5__ Transfer from Metrobus (Route #__)
3__ Drove with others (& parked)	6__ Other (specify: _____)
- How will you get to your final destination after this bus trip? (Check ONE only)
 

1__ Walk (#__ blocks)	4__ Picked up by car
2__ Drive alone (& park)	5__ Transfer to Metrobus (Route #__)
3__ Drive with others (& park)	6__ Other (specify: _____)
- Where is your final destination? (i.e. the location of your home, work, school, etc.) (Please provide the zipcode or community name \_\_\_\_\_)
- Please indicate all payment methods used to complete this trip. If you pay any cash fares, including transfer fees, please enter the total amount you will pay.
 

1__ Cash (total cash paid \$ _____)	
2__ Pass (specify pass type _____ pass cost \$ _____)	
3__ Don't pay a fare	4__ don't know
- Does your employer pay any/all of your bus fare? Yes \_\_\_ No \_\_\_
- Did you have a car/motor vehicle available for this trip? Yes \_\_\_ No \_\_\_
- Is this part of a round trip on the 95 EXPRESS bus today? Yes \_\_\_ No \_\_\_
- Consider the time it takes to make your entire trip from door to door. What is your typical total travel time in minutes? \_\_\_\_\_ mins
- How long have you been riding the 95 EXPRESS bus service?
 

1__ Less than 5 months	2__ 5 months to 1 year	3__ Over 1 year
------------------------	------------------------	-----------------
- How did you make this trip prior to riding the 95 EXPRESS bus?
 

1__ Travelled alone by car
2__ Carpooled in HOV lane
3__ Used other bus service (Please provide Route #__)
4__ Used other transit service (i.e. Tri-Rail / MetroRail)
5__ Did not make this trip
6__ Have always used the 95 EXPRESS bus
7__ Other (please specify: _____)

YOUR VIEWS ON THE 95 EXPRESS BUS SERVICE

13. How would you rate each of the following aspects of the 95 EXPRESS service?

Please circle the number that best reflects your opinion	Very Good	Good	Fair	Poor	Very Poor	Don't Know
a. Service reliability (on time performance)	5	4	3	2	1	0
b. Travel time	5	4	3	2	1	0
c. Hours of service (how long buses run)	5	4	3	2	1	0
d. Frequency of service (how often buses run)	5	4	3	2	1	0
f. Wait time at station/stop	5	4	3	2	1	0
g. Value for money of service	5	4	3	2	1	0
h. Availability of seats	5	4	3	2	1	0
i. Parking availability at Golden Glades Interchange	5	4	3	2	1	0
j. Your overall satisfaction with the 95 EXPRESS bus	5	4	3	2	1	0
k. Your overall satisfaction with Metrobus/BCT service	5	4	3	2	1	0

14. Did you ride the 95 EXPRESS bus before the northbound I-95 Express Lanes were opened in December 2008? Yes \_\_\_ No \_\_\_  
(If you answered 'No', please proceed to Question 19)

The following questions ask you to compare the 95 EXPRESS bus service today with the same service before the northbound I-95 Express Lanes were opened in December 2008 (from downtown Miami to Golden Glades Interchange).

15. How does the 95 EXPRESS bus service today compare to the same service before December 2008?

Please circle the number that best reflects your opinion	Better Now	Same Now	Worse Now	Don't Know
a. Service reliability	3	2	1	0
b. Travel time	3	2	1	0
c. Value for money of service	3	2	1	0
d. Availability of seats	3	2	1	0
e. 95 EXPRESS Service overall	3	2	1	0

16. If the 95 EXPRESS bus service has changed (either for better or worse) since the Express Lanes were opened in December 2008, please provide details...

17. Please indicate how your travel time on the current 95 EXPRESS bus service compares to before the Express Lanes were opened in December 2008.
- |                            |                        |
|----------------------------|------------------------|
| 1__ 30 mins faster or more | 4__ 1 to 4 mins faster |
| 2__ 15 to 29 mins faster   | 5__ About the same     |
| 3__ 5 to 14 mins faster    | 6__ Slower             |
18. Did the opening of the I-95 Express Lanes influence your decision to ride the 95 EXPRESS bus service? Yes \_\_\_ No \_\_\_  
If yes, please explain below....

PLEASE TELL US A LITTLE ABOUT YOURSELF. ALL REPLIES ARE STRICTLY CONFIDENTIAL.

19. Are you female or male? 1\_\_ Female 2\_\_ Male
20. How old are you? \_\_\_\_\_ years old
21. Are you Hispanic/Latino? 1\_\_ Yes 2\_\_ No
22. Are you...  
1\_\_ African American/Black  
2\_\_ White  
3\_\_ Other (specify: \_\_\_\_\_)
23. What is your household's approximate total annual income?  
1\_\_ Less than \$20,000  
2\_\_ \$20,000 to \$29,999  
3\_\_ \$30,000 to \$39,999  
4\_\_ \$40,000 to \$59,999  
5\_\_ \$60,000 to \$74,999  
6\_\_ \$75,000 or more
24. What is the total number of cars or other motor vehicles owned or leased by your household?  
0 (none) 1 2 3 4 5 or more
25. Please indicate your level of access to a car/motor vehicle.  
"A car/motor vehicle is available for my personal use...."  
1\_\_ Always 2\_\_ Most of the time 3\_\_ Occasionally 4\_\_ Never

ANY OTHER COMMENTS

26. If you have any other comments regarding the 95 EXPRESS bus service, the local transit system, or transportation in general, please provide them below:

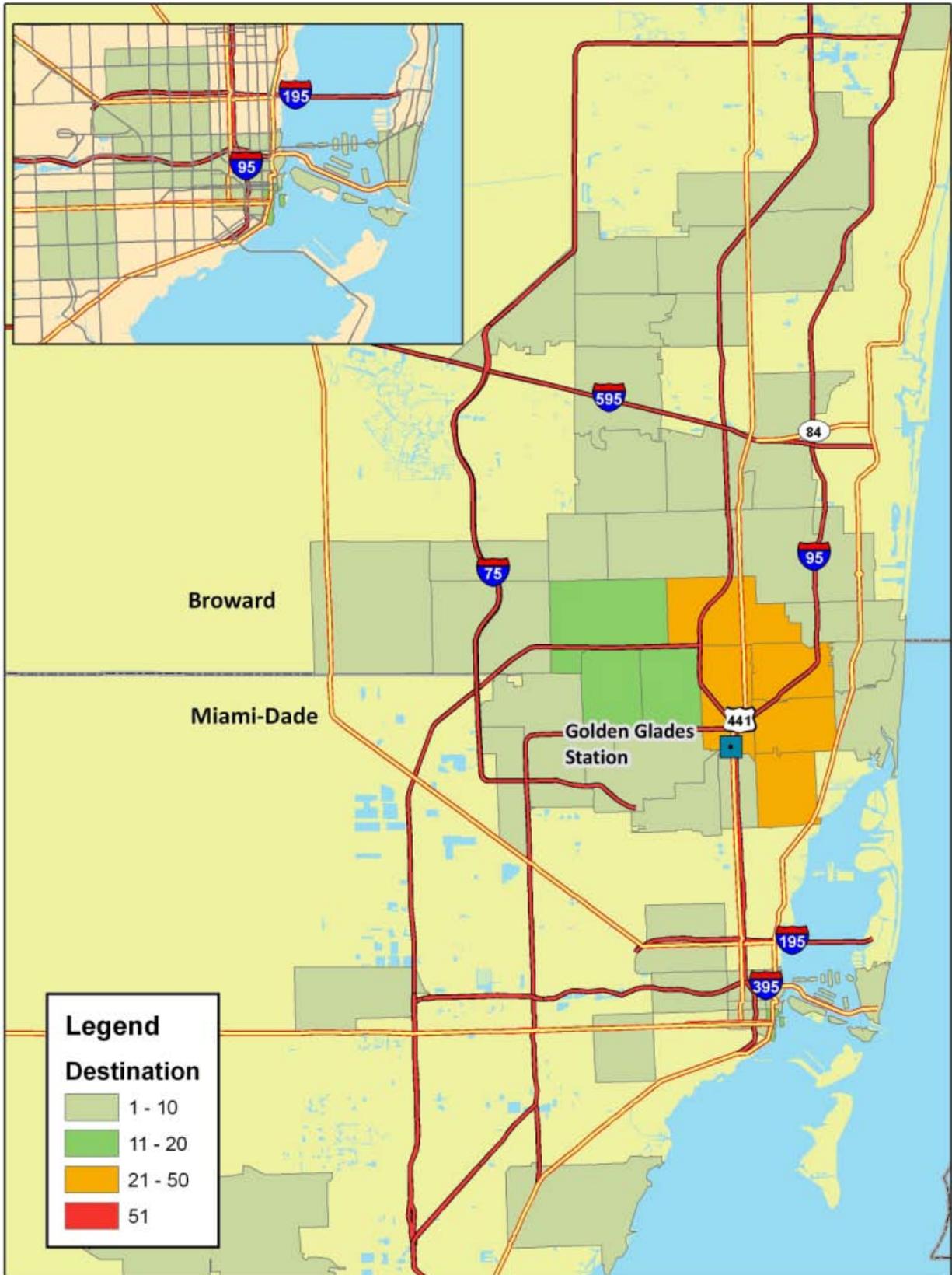
THANK YOU FOR COMPLETING THE SURVEY! PLEASE RETURN IT TO THE BUS DRIVER, SURVEYOR, OR LEAVE IT ON YOUR SEAT TO BE PICKED UP.

Figure II-2: 2009 Survey Instrument

# Appendix III – 95 Express User Origins and Destinations (2009 Survey)



FIGURE III-1: 95 Express User Trip Origins (Northbound Trips Only)



**FIGURE III-1: 95 Express User Trip Destinations (Northbound Trips Only)**

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