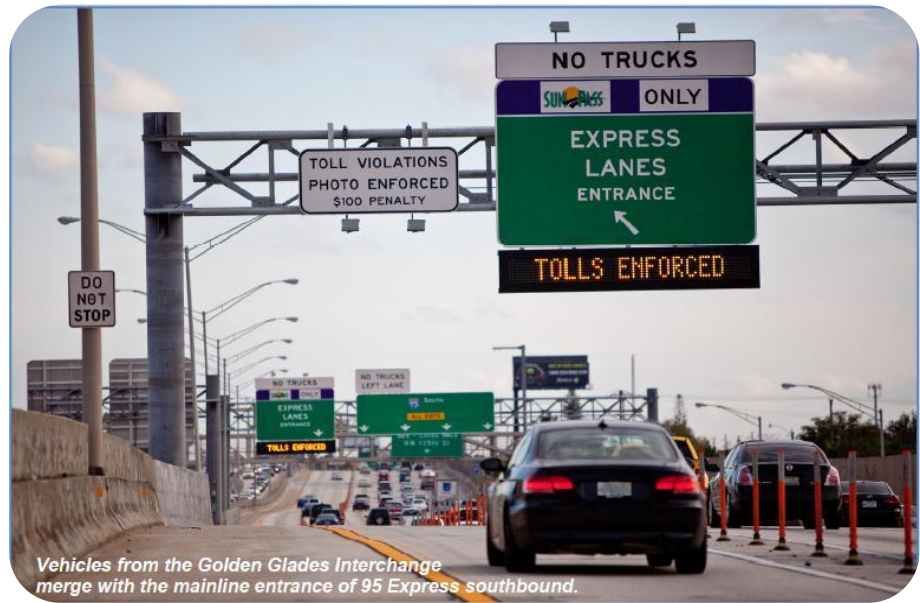


95 Express Managed Lanes Consolidated Analysis Technical Report



Vehicles from the Golden Glades Interchange merge with the mainline entrance of 95 Express southbound.

Vehicles from the Golden Glades Interchange merge with the mainline entrance of 95 Express southbound.



November 2011

FDOT District 4

Prepared by

Cambridge Systematics, Inc

Acronyms

AVO	Average Vehicle Occupancy
CCTV	Closed Circuit Television
CMP	Congestion Management Program
CUTR	Center for Urban Transportation Research
DMS	Dynamic Message Sign
EL	Express Lanes
ELW	Express Lanes Watcher
FDOT	Florida Department of Transportation
FHP	Florida Highway Patrol
FHWA	Federal Highway Administration
FTE	Florida's Turnpike Enterprise
SR	State Road
GGI	Golden Glades Interchange
TMC	Transportation Management Center
GPL	General Purpose Lanes
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
I-95	Interstate 95
ITS	Intelligent Transportation Systems
LOS	Level of Service (A through E)
MDT	Miami-Dade Transit
MPH	Miles Per Hour
MVDS	Microwave Vehicle Detection System
SFCS	South Florida Commuter Services
SOV	Single Occupancy Vehicle
TSP	Transit Signal Priority
UPA	Urban Partnership Agreement

Introduction

95 Express Managed Lanes began operating Phase 1A in December 2008, providing travelers with an alternative to the congested general purpose travel lanes between downtown Miami and the Golden Glades Interchange seven miles to the north. The project was funded by USDOT's Urban Partnership Agreement Congestion Reduction Demonstration program. The Urban Partnership Agreement (UPA) is an agreement between the USDOT and the USDOT's Miami-Area Urban Partner, consisting of the FDOT, the Miami-Dade and Broward MPOs, MDT, BCT, the Miami-Dade Expressway Authority, and Florida's Turnpike Enterprise. The UPA was formed to address the problem of congestion, and it consists of two components: (1) converting HOV lanes into Managed Use Lanes (MULs) and (2) implementing Bus Rapid Transit services within the portions of the newly converted lanes. The UPA funded the construction of the MULs and the capital portion of the transit using Federal Funds. Revenue generated from 95 Express tolls support the Operations & Maintenance of the transit service.

95 Express was scheduled to be constructed in the following phases:

- Phase 1A opened in December 2008 and runs northbound on I-95 from I-195/SR-112 to the Golden Glades area just north of 151st Street in Miami-Dade County. Phase 1B opened for tolling in January 2010 and runs southbound on I-95 from just south of Miami Gardens Drive/NW 186th Street to just north of I-395/SR-836. Phase 1B also extended the northbound express lanes further to the south from just north of I-195/SR 112 to I-395/SR-836. In this report, where it states Phase 1, it refers to both Phase 1A and Phase 1B.
- Phase 2 construction started on November 28th, 2011, and will last approximately three years. Phase 2 will extend the express lanes to provide a continuous facility between I-395/SR-836 in Miami-Dade County and Broward Boulevard in Broward County. The UPA calls for additional Bus Rapid Transit service as part of Phase 2 implementation, and FDOT will be working closely with BCT and MDT to plan the additional service.



The 95 Express project involved replacing high occupancy vehicle (HOV) lane in each direction with two variable-priced managed lanes that allow registered carpools of three or more occupants to travel free, together with enhanced express bus services. The result was to improve the peak-period operations on this corridor through:

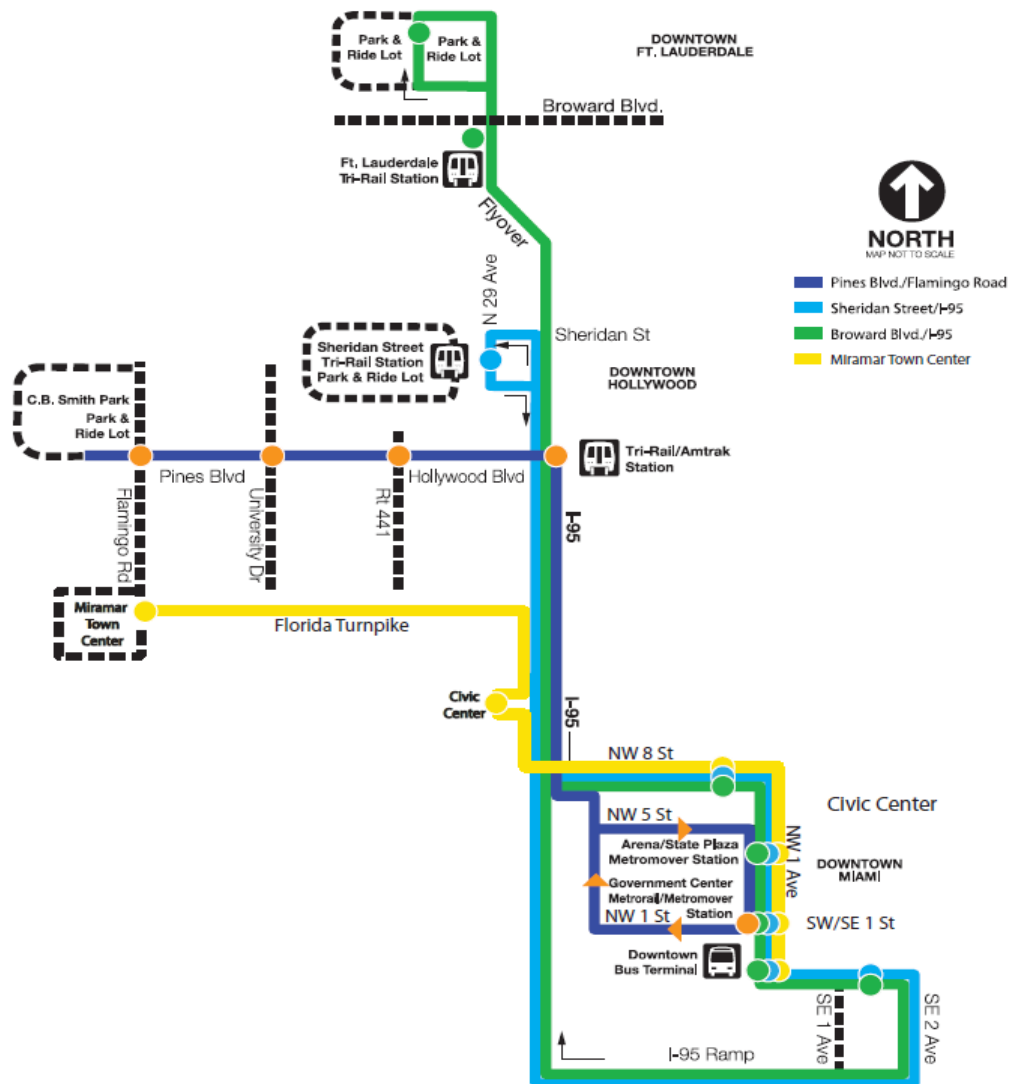
- Increased vehicle and person throughput
- Increased travel speeds

- Improved travel time reliability
- Enhanced transit service

These improvements resulted largely from increased capacity due to the addition of one travel lane in each direction. This was accomplished within the existing right-of-way by relying on design variances for roadway lane and shoulder widths. However, the addition of 12 peak hour express buses and accommodating registered vanpools and carpools have been a valuable contributor to the successful management of this corridor for reliable peak period travel. Four express bus routes are currently operating on the express lanes, they are:

- 95 Express Miramar;
- 95 Express Pembroke Pines;
- Route I-95 Dade Broward Express – Broward Boulevard
- Route I-95 Dade Broward Express – Sheridan Street

Figure 1 95 Express Commuter Bus System Map



Consolidating the Findings from 12 Reports

Since the opening of the 95 Express Phase 1A, numerous reports have been prepared to report different aspects of this project and fulfill different purposes. Cambridge Systematics was tasked by Florida Department of Transportation, District 4, to prepare a compact yet comprehensive summary of the findings, conclusions, and recommendations from twelve independent reports on operations before and after the opening of 95 Express. The objective of the review was to cross-reference the evaluation metrics from each of the reports, and to identify trends and any data inconsistencies. The twelve reports are listed in Table 1 below by report date.

Table 1. List of 95 Express Managed Lanes Reports Evaluated

Report Reference Number	Date Published	Name	Reporting Agency/Author	Focus
(1)	August, 2008	2008 I-95 High-Occupancy Vehicle Lane Monitoring Report	FDOT D4/Cambridge	Current and historical operations of the I-95 HOV facility; includes transit
(2)	June, 2009	95 Express Survey Results Report for Phase 1A	SFCS/FTE	Web survey of users to report feedback on the I-95 Express Lanes (Phase 1A - NB)
(3)	October, 2009	95 Express Midyear Report	FDOT D6/AECOM	Report to the Urban Partnership Agreement (UPA) partners on initial operations, based on performance measures in the National Evaluation Framework
(4)	November, 2009	Miami Urban Partnership Agreement (UPA) Project Phase 1A Transit Evaluation Report	CUTR	Transit evaluation - four basic objectives identified in the National Evaluation Framework
(5)	June, 2010	Transit On-Board Survey Results	Kimley-Horn	Summary of the on-board transit surveys
(6)	November, 2010	95 Express Survey Results Report for Phase 1A and 1B	SFCS/FTE	Web survey of users to report feedback on the I-95 Express Lanes (Phase 1A and 1B - NB & SB)
(7)	January, 2011	95 Express Annual Report - Project Status for UPA	FDOT D6 /AECOM	One year report on Phase 1A & 1B to UPA
(8)	January, 2011	Miami UPA Project Phase 1 Transit Evaluation Report	CUTR	Transit evaluation - four basic objectives identified in the National Evaluation Framework
(9)	January, 2011	Pines Boulevard. Transit Signal Priority - Traffic Queue Data Analysis	FDOT D4 /Kimley-Horn	Impacts of I-95 Express Bus TSP on general traffic
(10)	February, 2011	Pines Boulevard. Transit Signal Priority Evaluation - Transit	CUTR	Impacts of -95 Express Bus TSP on transit travel times
(11)	March, 2011	2010 I-95 High-Occupancy Vehicle Lane Monitoring Report	FDOT D4/Cambridge	Bi-Annual evaluation of HOV and MUL facility
(12)	May, 2011	95 Express Monthly Operations Report	FDOT D6/AECOM	Latest monthly report of the 95 Express Lanes operations

Note: The Report Reference Number is referred to in the body of the report below.

This memorandum is accompanied by a **95 Express Evaluation Summary BROCHURE** that presents key findings and common measures from the analysis completed and described below.

Through this memorandum and its accompanying Brochure, local government agencies, local and national interest groups can quickly acquire a basic understanding of the 95 Express project in South Florida and the various aspects distinctive to this project. This memorandum also functions as a quick reference to the reviewers. If a reviewer is particularly interested in one aspect of the 95 Express project, he/she can follow the reference and find the detailed information in the original report.

The approach to consolidating the analysis and findings of 12 MUL reports included:

- Review and compile twelve reports into six groups based on the focus of report. The groups are shown below. Within each report group, identify trends and patterns to indicated changes in before-and-after conditions.
 - I-95 High-Occupancy Vehicle (HOV) Lane Monitoring Reports - Report 1 and Report 11
 - I-95 Express- FDOT Congestion Management Program Reports - Report 2 and Report 6
 - I-95 Express Impact on Transit Services Reports for UPA - Report 3, Report 7 and Report 12
 - Driver Survey on I-95 Managed Lanes in Miami Dade - Report 4 and Report 8
 - Express Bus Survey on I-95 in Broward and Miami-Dade - Report 5
 - Transit Signal Priority Reports in Broward and Miami-Dade - Report 9 and Report 10

- Identify performance measures to summarize the traffic and transit elements of these reports. Given the wide range of report contents and measures reported, a limited number of measures were selected. Table 2 presents the performance measures that were selected for this summary evaluation.

Table 2. Performance Measures Selected 95 Express ML Reports

Traffic	Transit
Volume	Travel Time
Speed	Ridership
Occupancy	Delay Time
Throughput	User Experience
Travel Time	
Delay Time	
User Experience	

- Develop a comparison across the six report groups - summarizing data collection time, location and data sources used to calculate performance measures. Based on the comparison, it was decided to focus on reports that used original data rather data obtained from another effort or report. The performance measures were assembled into five summary tables which are included in the Managed Lanes Summary Brochure (pages 2 through 6).
- Recommended sources for each performance measure selected are documented in the Appendix of this review.

CONSOLIDATED FINDINGS FROM I-95 EXPRESS REPORTS EVALUATED

Report Group 1: I-95 High-Occupancy Vehicle (HOV) Lane Monitoring Reports

Group 1 is consisted of Report No.1 and Report No.11. Both reports were completed by FDOT D4/Cambridge. Report 1 was completed in 2008, Report 11 was completed in 2011. These reports provide the performance measures of the evaluation year, and identify the trends in mobility performance measures along I-95 from downtown Miami to the northern limit of HOV lanes in Palm Beach County. They are a continuing effort to document current operations of the HOV facility and to determine whether operational changes are warranted. The methodology employed for monitoring of the facility included:

- Collecting traffic counts, travel time, and vehicle occupancy for several locations along the freeway; collecting 95 Express Bus ridership; obtaining Vanpool information; obtaining HOV violation data from FHP for Palm Beach, Broward, and Miami-Dade Counties;
- Reporting 2010 performance measures and their trends: volume, speed, LOS, and travel time per lane; calculating travel time savings using HOV/MUL lanes; person throughput and change in person throughput on HOV/MUL lanes; and reporting HOV violations for each County.
- The peak periods defined in these reports are 7:00 – 9:00 in the morning, and 4:00 – 6: 00 in the afternoon.

Performance Measures reported in HOV reports are documented in Table 3.

Table 3: HOV Lane Report Performance Measures

Performance Measure	Description	Data Source Report(s)
Volume (Traffic)	24 hours continuous counts collected for 11 locations in Report 1, and 13 locations in Report 11.	1&11
Speed (Traffic)	Calculated (by section, direction and peak period) based on data collected from travel time runs	1&11
Occupancy (Traffic)	Calculated based on number of single-occupant, two-occupant, and 3 or more person vehicles observed (by direction and for HOV enforced period)	1&11
Throughput (Traffic)	Average Vehicle Occupancy (AVO) and traffic volume were used to calculate, by direction and peak period	1&11
Travel Time (Traffic)	Travel time runs as defined in the Manual on Uniform Traffic Studies (MUTS), by direction and peak period	1&11
Delay Time (Traffic)	Delay was recorded for any vehicle in the test vehicles for the floating car method, by direction and peak period	1&11
User Experience (Traffic)	N/A	-
Travel Time (Transit)	N/A	-
Ridership (Transit)	Alighting counts were collected at Golden Glades station in 2008 for the 95 Express northbound buses in the PM peak period; an on-board survey was conducted in 2010 for all four 95 Express Bus routes for both AM and PM in the peak directions.	1&11
Delay Time (Transit)	N/A	-
User Experience (Transit)	N/A	-

Report 1- 2008 I-95 High-Occupancy Vehicle Lane Monitoring Report

Background- The report covers an evaluation of the HOV facility on I-95 in South Florida from SR 112 in Miami-Dade County to about one mile north of 10th Ave N in Palm Beach County. This study was conducted before the 95 Express lanes Phase 1A opened.

Time Period- The 24-hour counts in Broward and Palm Beach counties were collected on selected days between Tuesday and Thursday in February and March, 2008. The three-day counts in Miami-Dade County were collected from Tuesday to Thursday, February 12-14, 2008 in advance of 95 MUL lanes¹ Construction. Vehicle occupancy surveys were conducted on February 20th, 2008 in Miami-Dade County, March 11th, 12th, and 13th, 2008 in Broward County, March 18th, 19th, and 20th, 2008 in Palm Beach County.

Report 11- 2010 I-95 High-Occupancy Vehicle Lane Monitoring Report

Background- The report covers an evaluation of the HOV/MUL facility on I-95 in South Florida from SR 112 in Miami-Dade County to south of PGA Boulevard in Palm Beach County. This study included the extension of HOV lanes north to PGA Boulevard and was conducted after the 95 Managed Use Lanes Phase 1A and 1B opened.

Time Period- The 24-hour counts in Miami-Dade, Broward and Palm Beach counties were collected between Tuesday and Thursday, March 23-25, 2010. Vehicle occupancy surveys were conducted on March 16th, 2010 in Miami-Dade county, March 17th, 2010 in Broward County, March 18th, 23rd, and 24th, 2010 in Palm Beach County.

Findings

These reports were selected to be included in the I-95 HOV/MUL Lane Traffic Data Summary in the Brochure (page 3), because the performance measures reported in this group of reports are identified as the key measures for traffic, and data collected for these reports are the data sources for other reports.

Report Group 2: Driver Survey on I-95 Managed Lanes in Miami Dade

Group 2 is consisted of Report 2 and Report 6. Both reports were completed by SFCS and FTE. Report 2 was completed in 2009, Report 6 was completed in 2010. These reports summarized surveys distributed to SunPass account holders in Broward and Miami-Dade Counties, South Florida Commuter Service database participants, and various employers located along the I-95 corridor.

Participants were asked if they have used I-95 in Miami-Dade in the last six months. If the answer was “no”, participants were only requested to respond if they knew of the 95 Express Lanes. All other participants were asked a series of questions regarding usage of I-95 and 95

¹ <http://www.95express.com/>

Express. Based on their answers, the survey would take them to additional questions that would be relevant. All questions were optional including a series of demographic questions at the end of the survey.

Performance Measures reported in Driver Survey reports are presented in Table 4.

Table 4: Driver Surveys Performance Measures

Performance Measure	Description	Data Source Report(s)
Volume	N/A	-
Speed (Traffic)	N/A	-
Occupancy (Traffic)	N/A	-
Throughput (Traffic)	N/A	-
Travel Time (Traffic)	N/A	-
Delay Time (Traffic)	N/A	-
User Experience (Traffic)	Questions asked regarding travel experience	2&6
Travel Time (Transit)	N/A	-
Ridership (Transit)	N/A	-
Delay Time (Transit)	N/A	-
User Experience (Transit)	Questions asked for transit users of the I-95 Express Bus	2&6

Report 2- 95 Express Survey Results Report for Phase 1A

Background- This survey was conducted to gauge feedback on the I-95 Express Lanes Phase 1A that were implemented in Miami-Dade County between Downtown Miami and the Golden Glades Interchange on December 8, 2008.

Time Period- This survey was distributed in May 2009.

Report 6- 95 Express Survey Results Report for Phase 1A and 1B

Background- This survey was conducted as a follow-up to the Phase 1A survey (Report #2). It was conducted to gauge feedback on the I-95 Express Lanes Phase 1A and Phase 1B that were completed in January 2010.

Time Period- This survey was distributed in October 2010.

Findings

The 95 Express Survey Results Report for Phase 1A and Phase 1B (Report #6) was selected to be included in the 95 Express Lane User Survey Results Summary in the Brochure (page 6), because the performance measures reported in this group of reports are identified as the key measures for both traffic and transit, and data collected for these reports are the data sources for other reports.

Report Group 3: I-95 Express- FDOT CMP Reports

Group 3 is consisted of Report 3, Report 7, and Report 12. These reports were completed by FDOT D6/AECOM. Report 3 was completed in 2009, Report 7 and Report 12 were completed in 2011. These reports provide general information to the Urban Partnership Agreement (UPA) partners (Atlanta, Los Angeles, Minneapolis, San Francisco and Seattle), other agencies and to the public concerning the congestion management program for I-95 in southeast Florida. These reports document the assigned performance measures of the 95 MUL lanes in the Congestion Reduction Demonstration (CRD): National Evaluation Framework.

These reports cover the following: operations/traffic statistics (speed/travel times data, reliability, volume data, person throughput, safety), revenue/tolls statistics (revenue, tolls, registrations/toll exempt trips), facility availability (incident management), enforcement, equipment availability, and transit.

Performance Measures reported in CMP reports are documented in Table 5.

Table 5: Congestion Management Program Performance Measures

Performance Measure	Description	Data Source Report(s)
Volume (Traffic)	Collected at the toll gantry and generated by SunPass software representing the # of trips, monthly compilation	3, 7, and 12
Speed (Traffic)	Collected by 53 vehicle detection sensors throughout the corridor	3, 7, and 12
Occupancy (Traffic)	AVO was collected which included Express Bus ridership from HOV Monitoring Reports	3&7
Throughput (Traffic)	Traffic volume and AVO which included Express Bus ridership was used to calculate throughput	3&7
Travel Time (Traffic)	Travel time savings in minutes was calculated	3&7
Delay Time (Traffic)	N/A	-
User Experience (Traffic)	Summary of 95 Express Survey Results conducted by SFCS included	7
Travel Time (Transit)	Summary of transit travel times taken from the on-board survey conducted in May 2010 by FDOT	7
Ridership (Transit)	Summary of the boardings per revenue mile and ridership for the 95 Express Bus Service taken from the on-board survey conducted in May 2010 by FDOT	7
Delay Time (Transit)	N/A	-
User Experience (Transit)	Summary of the on-board survey conducted in May 2010 was used to gauge the impact of the project on user perceptions	7

Report 3- 95 Express Mid-Year Report- Project Status for UPA

Background- This report covers Phase 1A of the 95 Express, which encompassed the 7-mile segment northbound on I-95 between State Road (SR) 112/I-195 and the Golden Glades Interchange in Miami-Dade County. The express lane pm peak period is defined from 4PM-7PM northbound (the southbound lanes were still under construction at this time.)

Time Period- The reporting period was from December 5, 2008 (the first day of tolling, unless otherwise noted in the report), through the first six full months of operations- June 30, 2009.

Report 7- 95 Express Annual Report- Project Status for UPA

Background- This report covers Phase 1 (a and b) of the 95 Express, which encompassed the 7-mile segments northbound and southbound on I-95 between State Road (SR) 836/I-395 and the Golden Glades Interchange in Miami-Dade County. The express lane am peak period is defined from 6AM-9AM southbound and the pm peak period is defined from 4PM-7PM northbound.

Time Period- The reporting period was from July 1, 2009, through June 30, 2010.

Report 12- 95 Express Monthly Operations Report

Background- This is a monthly report and covers the full operations of Phase 1 of 95 Express. The monthly reports started from July 2009. These reports covers statistics southbound and northbound for trips, revenue, tolls, volume, speed, reliability, and registrations. Toll exempt trips (transit vehicles and registered carpools and vanpools) were not reported for the month due to uncertainties with the transit data.

Time Period- The reporting period was for April 2011. The first monthly report was completed in July 2009.

Findings

This group of reports is focused on 95 MUL lanes. Revenue tolls statistics data, facility availability, and equipment availability data are unique contributions of these reports.

Report Group 4: I-95 Express Impact on Transit Services Reports for UPA

Group 4 is consisted of Report 4 and Report 8. These reports were completed by CUTR. Report 4 was completed in 2009, Report 8 was completed in 2011. These reports provide the results of the transit evaluation for the UPA program, the federally funded project to alleviate traffic congestion on the I-95 corridor between I-595 in Broward County and I-395 in Miami-Dade County. The evaluation addresses the following: transit service performance impacts, transit service usage impacts, transit users perceptions, and the context of the project's transit impacts. This group of reports provides average weekday ridership, travel time, user experience, and travel time comparison prior to the opening of 95 MUL lanes in 2008.

Performance Measures from reports on 95 Express Impact on Transit are presented in Table 6.

Table 6: Transit Services Impact Performance Measures

Performance Measure	Description	Data Source Report(s)
Volume (Traffic)	N/A	-
Speed (Traffic)	Speed taken from corresponding Miami UPA traffic evaluation report	4&8
Occupancy (Traffic)	AVO provided with and without 95 Express service taken from HOV Monitoring Reports	4&8
Throughput (Traffic)	Multiplication of peak period AVO values and peak period traffic volumes provided by FDOT	4&8
Travel Time (Traffic)	2008 and 2009: Floating car-based travel time runs from Miami UPA traffic evaluation report// 2010: Taken from 95 Express Monthly Operations Report April 2010	4&8
Delay Time (Traffic)	N/A	-
User Experience (Traffic)	N/A	-
Travel Time (Transit)	Actual scheduled travel times for the 95 Express Bus	4&8
Ridership (Transit)	MDT and BCT ridership totals for the 95 Express Bus service	4&8
Delay Time (Transit)	N/A	-
User Experience (Transit)	On-board surveys were conducted to assess transit user perceptions	4&8

Report 4- Miami UPA Project Phase 1A Transit Evaluation Report

Background- This report covers a transit evaluation of Phase 1A of the 95 Express, upon which the 95 Express Bus runs. The express lane pm peak period is defined from 4PM-7PM northbound.

Time Period- The reporting period is a before-after comparison with a baseline period of January to March 2008 and the post-deployment period of the 95 Express Lanes of January to March 2009. Pre- and post-deployment on-board surveys were conducted in May 2008 and May 2009.

Report 8- Miami UPA Project Phase 1 Transit Evaluation Report

Background- This report covers a longitudinal comparison over a three year period for the transit component of Phase 1. This report implements control groups for the 95 Express Bus Service to ascertain whether the results from the prior report was due to the UPA project and not outside factors. The control group was the entire Miami-Dade Metrobus system. Tri-Rail was excluded as it was impacted by the new transit service.

Time Period- The reporting period covers a three-year period; January to April 2008, as the baseline, January to April 2009, as Phase 1A post-deployment period, and January to April 2010 Phase 1B deployment period. Pre- and post-deployment on-board surveys were conducted in May 2008, as the baseline, May 2009, as post-deployment Phase 1A, and May 2010, as post-deployment Phase 1B.

Findings

The average weekday ridership data from the Miami UPA Project Phase 1 Transit Evaluation Report (Report #8) was selected to be included in the 95 Express Bus User Experience Summary in the Brochure (page 4), because the transit ridership is identified as the key measures for transit, and no other reports provide this data.

Report Group 5: 95 Express Bus Survey on I-95 Corridor in Broward and Miami-Dade Counties

Group 5 is consisted of Report 5. This reports were completed by Kimley-Horn. Report 5 was completed in 2010. This report provides a summary of the on-board transit surveys performed along the 95 Express bus routes. The survey included 25 questions covering the following: trip experience; view of the express bus service; typical trip information; and a brief socio-economic and demographic profile.

Performance Measures reported in the 95 Express Bus Survey report are documented in Table 7.

Table 7: Express Bus Survey Performance Measures

Performance Measure	Description	Data Source Report(s)
Volume (Traffic)	N/A	-
Speed (Traffic)	N/A	-
Occupancy (Traffic)	N/A	-
Throughput (Traffic)	N/A	-
Travel Time (Traffic)	N/A	-
Delay Time (Traffic)	N/A	-
User Experience (Traffic)	N/A	-
Travel Time (Transit)	N/A	-
Ridership (Transit)	On-board passenger counts were conducted	5
Delay Time (Transit)	N/A	-
User Experience (Transit)	On-board surveys were conducted to assess transit user perceptions	5

Report 5- 95 Express On-Board Transit Survey Results- Phase 1A/1B

Background- The surveys were conducted on I-95 (Dade-Broward) Express, Route 95 express, and the Pines-Hollywood (BCT Route 107) Express during the AM and PM peak. The surveys were conducted on one day for each route.

Time Period- The surveys were conducted during the week of May 10th, 2010 along the 95 express bus routes.

Findings

95 Express On-Board Transit Survey Results- Phase 1A/1B (Report #5) was selected to be included in the 95 Express Bus User Experience Summary in the Brochure (page 4), because the performance measures reported in this group of reports are identified as the key measures for transit, and data collected for these reports are the data sources for other reports.

Report Group 6: Transit Signal Priority Reports in Broward and Miami-Dade

Group 6 is consisted of Report 9 and Report 10. Report 9 was completed by FDOT D4 /Kimley-Horn, Report 10 was completed by CUTR. Both reports were completed in 2011. These reports provide a synopsis on the Transit Signal Priority (TSP) system implemented on the

Pines/Hollywood corridor in Broward County for the 95 Express buses. Impacts of Transit Signal Priority on both the side street traffic and the 95 Express bus operating on Hollywood/Pines Boulevard were evaluated through these two studies.

Performance Measures reported in TSP reports are presented in Table 8.

Table 8: TSP Report Performance Measures

Performance Measure	Description	Data Source Report(s)
Volume (Traffic)	N/A	-
Speed (Traffic)	N/A	-
Occupancy (Traffic)	N/A	-
Throughput (Traffic)	N/A	-
Travel Time (Traffic)	N/A	-
Delay Time (Traffic)	Traffic delay time was measured on side streets for major intersections when TSP were enabled for both AM and PM peak periods.	9
User Experience (Traffic)	N/A	-
Travel Time (Transit)	Transit travel time was measured for peak directions in both AM and PM peak periods	10
Ridership (Transit)	N/A	-
Delay Time (Transit)	Transit delay time was measured for peak directions in both AM and PM peak periods.	10
User Experience (Transit)	N/A	-

Report 9- Hollywood/Pines Blvd Transit Signal Priority Traffic Queue Data Analysis

Background- This report summarized the findings of a two-week test on the TSP system. Data was collected and analyzed for five signalized intersections. The objective of the report was to determine the change in side street queue characteristics after the activation of the TSP system.

Time Period- "Before" data were collected on December 7, 8, and 9, 2010 (Tuesday, Wednesday, and Thursday); "After" data were collected on December 14, 15, and 16, 2010 (Tuesday, Wednesday, and Thursday).

Report 10- Pines Boulevard Transit Signal Priority Evaluation - Transit

Background- This report summarized the findings of a two-week test on the TSP system. The objective of the report was to evaluate the impacts of TSP on transit travel times. Data was collected manually from the South Florida Commuter Services staff and from Broward County Transit (BCT)'s automatic passenger counter (APC) system.

Time Period- "Before" data were collected on December 6 and 7, 2010 (Tuesday and Wednesday); "After" data were collected on December 14 and 15, 2010 (Tuesday and Wednesday).

Findings

Hollywood/Pines Blvd Transit Signal Priority Traffic Queue Data Analysis (Report #9) and Pines Boulevard Transit Signal Priority Evaluation – Transit (Report #10) were selected to be included in the Pines Boulevard Express Bus TSP Impact Studies Summary in the Brochure

(page 5), because the performance measures reported in this group of reports are identified as the key measures for traffic and transit.

95 Express Evaluation Summary Brochure

Accompanying this memorandum is a BROCHURE providing key findings and common measures from the analysis completed, including numerous graphs and tables.

Appendix A: Data Tables

The purpose of Appendix A is to present the data provided in each report. These data are categorized into traffic and transit data, with traffic data further categorized into speed, volume, occupancy, throughput, travel time, and travel delay data; and transit data further categorized into ridership, travel time, travel delay, and user experience. For numerical data, the value is provided; for descriptive information, a check mark (✓) is used to indicate that the report provides such information; "NA" is used for the data that is not available in the report.

Report Group 2: Driver Survey on I-95 Managed Lanes in Miami Dade

Report	(3) 95 Express Midyear Report			(7) 95 Express Annual Report NA Project status for UPA						(12) 95 Express Monthly Operations Report				Trend ¹	
	Northbound		Total	Southbound		Northbound		Total	Southbound		Northbound		NB	GPL	
	EL	GPL		EL	GPL	EL	GPL		EL	GPL	EL	GPL			
Trips	NA	NA	11.9 mil	NA	NA	NA	NA	1.7 mil							
Revenue	NA	NA	\$9.1 mil	NA	NA	NA	NA	\$1.41	\$ 855,817	\$ 707,887.00	\$ 851,909				
Speed			Total												
Average Peak	56.7	41.3	NA	63.7	51.0	55.8	41.3	NA	62	50	55	41	↓	NA	
Overall Average Speed	61.1	54.9	NA	64.3	57.5	61.6	56.7	NA	64	57	64	57	↑	↑	
Average Weekday Travel Speeds	57	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Average Weekend Speed	NA	NA	NA	NA	NA	NA	NA	NA	65	59	63	58	NA	NA	
Reliability (EL Speeds >45 MPH)	99.4%	99.5%	NA	99.9%		99.4%		NA	100.0%		99.1%		NA	NA	
Volume			Total												
Average Weekday Traffic (Veh)	22,600	103,100	NA	26,100	NA	25,000	NA	NA	28,173	NA	25,963	NA	↑	NA	
Average Weekend Traffic	NA	NA	NA	15,300	NA	14,600	NA	NA	16,835	NA	15,404	NA	NA	NA	
Highest EL Weekday Traffic (Veh)	NA	NA	NA	29,300	NA	28,100	NA	NA	32,268	NA	29,245	NA	NA	NA	
Average Peak Period Traffic (Veh)	6,910	18,064	NA	7,500	NA	7,400	NA	NA	7,966	NA	7,585	NA	↑	NA	
EL % of Overall Traffic	NA	NA	NA	19%	NA	20%	NA	NA	NA	NA	NA	NA	↓	↓	
Highest EL Hour Traffic (Veh)	NA	NA	NA	31,300	NA	32,100	NA	NA	3,506	NA	3,041	NA	NA	NA	
Overall Average Volume (Weekdays)	NA	NA	NA	543	1,135	522	941	NA	NA	NA	NA	NA	NA	NA	
			2009	2008	2009	2008	2009	2010							
			Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound						
			EL	GPL	EL	GPL	EL	GPL	EL	GPL	EL	GPL			
Volume (Peak Period w Express Bus)	2,322	6,863	1,300	4,740	2,322	6,863	3,051	6,506	2,594	7,032	NA	NA	↑	↑	
			2009	2008	2009	2008	2009	2010							
			Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound						
			EL	GPL	EL	GPL	EL	GPL	EL	GPL	EL	GPL			
Occupancy	1.39	1.39	2.20	1.15	1.39	1.39	1.30	1.17	1.45	1.32	NA	NA	↑	↓	
AVO (Peak Period w Express Bus)													↑	↑	
			2009	2008	2009	2008	2009	2010							
			Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound						
			EL	GPL	EL	GPL	EL	GPL	EL	GPL	EL	GPL			
Throughput	3,228	9,540	2,353	5,452	3,228	9,540	4,132	7,610	3,829	9,280	NA	NA	↑	↓	
Throughput (Peak Period w Express Bus)													↑	↓	
Person Throughput	610	715	NA	NA	NA	NA	4,132	7,610	3,829	9,280	NA	NA	↑	↑	
Percentage	23%	8%	NA	NA	NA	NA	76%	40%	19%	NA3%	NA	NA	↓	↓	
			Total												
Travel Time			NA										↑	↓	
Average Weekday Travel Times	6.8	10.2	NA	6.9			7.7	NA	NA	NA	NA	NA	↑	↓	
			Total										NA	NA	
Delay Time	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
			Total												
Revenue/Tolls Statistics			NA												
Average EL Peak Period Revenue	NA	NA	NA	NA	NA	NA	NA	NA	\$560	\$533	NA	NA	NA	NA	
Average EL Weekday Revenue	NA	NA	NA	\$10,900	\$13,800	NA	\$11,991	\$14,121	NA	NA	NA	NA	NA	NA	
Average EL Weekend Day Revenue	NA	NA	NA	\$22,300	\$22,400	NA	\$24,734	\$23,157	NA	NA	NA	NA	NA	NA	
			NA	\$3,400	\$3,400	NA	\$4,369	\$3,562	NA	NA	NA	NA	NA	NA	
			Total										↑	↓	
Transit Ridership and Model Share			NA												
95 Express Bus Increase	NA	NA	22%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Boarding per revenue mile - %	NA	NA	-14%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Net corridor bus ridership - %	NA	NA	-21%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Systemwide MDT ridership - %	NA	NA	-15%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Transit Mode Share - %	NA	NA	NA	16.1%		14.3%	NA	NA	NA	NA	NA	NA	NA	NA	
			Total												
Travel Time	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
			Total												
Delay Time	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
			Total												
User Experience			NA												

Data Source
Data Time Period

FDOT D6
7/1/09-6/30/10

FDOT D6 Monthly Operations
Apr-11

Report Group 3: I-95 Express- FDOT CMP Reports

		(4) Miami Urban Partnership Agreement (UPA) Project Phase 1A Transit Evaluation Report			(8) Miami UPA Project Phase 1 Transit Evaluation Report						
Traffic	Speed		HOV/EL	GPL		HOV/EL	GPL				
		2008	18.1	18.8		18.1	18.8				
		2009	56.8	39.7		56.8	39.7				
		2010	NA	NA		55	42				
	Volume		NA	NA	NA	NA	NA				
	Occupancy		2006	2008	2009	2008	2009	2010			
	ML- AVO w/95X		2.23	1.95	1.39	EL- AM SB	2.20	NA	1.36		
	ML- AVO w/o 95X		1.99	1.68	1.22	EL- PM NB	1.95	1.39	1.50		
	Facility- AVO w/95X		1.26	1.5	1.39	GP- AM SB	1.15	NA	1.17		
	Facility- AVO w/o 95X		1.21	1.45	1.34	GP- PM NB	1.40	1.39	1.32		
					Facility- AM SB	1.38	NA	1.23			
					Facility- PM NB	1.50	1.39	1.37			
Transit	Throughput		Northbound PM			Southbound AM			Northbound PM		
			2008	2009		2008	2009	2010	2008	2009	2010
	SOV		1,061	3,778		573	NA	4,827	1061	3,778	3,686
	HOV 2		3,040	1,899		3,624	NA	1,702	3040	1,899	2,566
	HOV 3		477	171		294	NA	49	477	171	308
	Transit		810	821		1,026	NA	1,259	810	821	1,099
	Total		5,387	6,669		5,517	NA	7,837	5388	6,669	7,659
	SOV					7,599	NA	10,982	8080	8,428	9,300
	HOV 2					2,156	NA	4,215	7397	6,282	8,602
	HOV 3					358	NA	155	1858	2,387	108
	Transit					NA	NA	NA	NA	NA	NA
	Total					10,113	NA	15,352	17335	17,097	18,010
	SOV		9,141	12,206		8,172	NA	15,809	9141	12,206	12,986
	HOV 2		10,437	8,181		5,780	NA	5,917	10437	8,181	11,168
	HOV 3		2,335	2,558		652	NA	204	2335	2,558	416
	Transit		810	821		1,026	NA	1,259	810	821	1,099
	Total		22,723	23,766		15,630	NA	23,189	22723	23,766	25,669
	Travel Time		HOV/EL	GPL		HOV/EL	GPL				
		2008	25:02	24:06		25:02	24:06				
		2009	7:59	11:25		7:59	11:25				
	2010	NA	NA		8:14	10:47					
Scheduled Travel Time		SB AM Peak	NB PM Peak		SB AM Peak	NB PM Peak					
	Dec-07	32	32		32	32					
	Jun-08	32	24		32	24					
	Jun-09	32	22		32	22					
	Jun-10	NA	NA		25	25					
Average Weekday Ridership		Jan-Mar 08	Jan-Mar 09		Jan-Apr 08	Jan-Apr 09	Jan-Apr 10				
MDT Systemwide		264,127	250,300		264,470	251,875	225,900				
MDT Express Bus		13,670	12,449		NA	NA	NA				
95 Express Buses		1,813	2,353		1,827	2,398	2,877				
95X (Golden Glades Express)							2,067				
Dade-Broward Express							631				
Pines Blvd. Express							239				
Routes 77 and 277		12,280	11,086		12,335	11,190	9,804				
Average Weekday Boardings per Revenue Mile		Jan-Mar 08	Jan-Mar 09		Jan-Apr 08	Jan-Apr 09	Jan-Apr 10				
MDT Systemwide		NA	NA		2.47	2.5	2.5				
95 Express Buses		0.84	1.17		0.85	1.19	0.73				
95X (Golden Glades Express)							1.28				
Dade-Broward Express							0.34				
Pines Blvd. Express							0.36				
Transit Mode Share					2008	2009	2010				
AM SB- EL		√			18.60%	NA	16.10%				
AM SB- RL		√			NA	NA	NA				
AM SB- Facility		√			6.60%	NA	5.40%				
PM NB- EL		√			15.00%	12.30%	14.30%				
PM NB- RL		√			NA	NA	NA				
PM NB- Facility		√			3.60%	3.40%	4.30%				
User Perceptions		2009			2010						
Demographics		√			√						
Private Vehicle Use		√			√						
Reasons for Riding 95X		√			√						
Origins/Desinations		√			NA						
Mode of Access/Egress		√			NA						
Length of Service Use		√			√						
Fare Payment		√			NA						
Service Reliability		√			√						
Travel Time		√			√						
Value for Money of Service		√			√						
Availability of Seats		√			√						
Overall 95X		√			√						

Data Source FDOT I-95 Lane Monitoring Reports and FDOT Biannual HOV Lane Monitoring Reports
 Data Time Period 1/2008-3/2008 1/2009-3/2009

Report Group 4: I-95 Express Impact on Transit Services Reports for UPA

		(2) 95 Express Survey Results Report for Phase 1A		(6) 95 Express Survey Results Report for Phase 1A&1B*	
Report					
Distribution					
SunPass account holders (Broward and Miami-Dade)		160,000		160,000	
South Florida Commuter Service participants		30,000		35,000	
Miami-Dade Government Employees		28,000		NA	
Employers along I-95		126		212	
Greater Miami Chamber of Commerce Member		NA		NA	
Survey Participants		9,156		5,031	
Respondents traveled I-95 in past 6 months		8,986		4,890	
Participants that provided comments		2,143		2,602	
Speed (Percent of Responses)		To work		To work	
Faster than 45 MPH		66%		81%	
21-44 MPH		28%		12%	
Slower than 20 MPH		6%		3%	
Volume		NA		NA	
Occupancy		NA		NA	
Throughput		NA		NA	
Travel Time to/from work (# of Responses)		Northbound		Southbound	
Traffic	Less than 15 min	432		NA	
	15-30 min	1,367		NA	
	31-45 min	1,325		NA	
	40-60 min	796		NA	
	more than 60 min	308		NA	
Travel Time Savings (# of Responses)		Northbound		Southbound (Phase 1A)	
1-5 min		673		613	
6-10 min		1,442		1,106	
11-15 min		1,264		1,002	
more than 15 min		1,710		1,248	
it does not save time		226		133	
It takes longer now than before		72		43	
I am not sure		720		464	
Travel Delay		NA		NA	
Travel Time		NA		NA	
Transit	Ridership	NA		NA	
	Travel Delay	NA		NA	
	User Experience	√		√	
Data Source		SFCS		SFCS	
Data Time Period		2009		2010	

*The survey results provided in this summary table are based on the result of a three month online survey. The report, however, reflects only the results from the first two month of the online survey.

Report Group 5: 95 Express Bus Survey on I-95 Corridor in Broward and Miami-Dade Counties
Report (5) Transit On-Board Survey Results

Route	Dade-Broward		Route 95		Pines/Hollywood		All Routes	
	AM	PM	AM	PM	AM	PM	AM	PM
Passengers	393	317	591	364	118	112	NA	NA
Surveys	281	207	290	182	105	75	NA	NA
%	72%	65%	49%	50%	89%	67%	NA	NA
Speed	NA	NA	NA	NA	NA	NA	NA	NA
Volume	NA	NA	NA	NA	NA	NA	NA	NA
Occupancy	NA	NA	NA	NA	NA	NA	NA	NA
Throughput	NA	NA	NA	NA	NA	NA	NA	NA
Travel Time	NA	NA	NA	NA	NA	NA	NA	NA
Travel Delay	NA	NA	NA	NA	NA	NA	NA	NA
Travel Time								
Very Good	72%	64%	64%	47%	48%	41%	65%	53%
Good	24%	29%	27%	41%	34%	40%	27%	35%
Fair	2%	5%	7%	8%	12%	15%	6%	8%
Poor	0%	0%	0%	1%	0%	0%	0%	0%
Very Poor	0%	0%	0%	0%	0%	1%	0%	0%
Don't Know	0%	0%	0%	0%	1%	0%	0%	0%
No response	1%	2%	2%	4%	5%	3%	2%	3%
Ridership	NA	NA	NA	NA	NA	NA		
Travel Delay	NA	NA	NA	NA	NA	NA		
User Experience								
Very Good	69%	65%	46%	38%	61%	43%	57%	51%
Good	28%	31%	39%	38%	30%	41%	33%	36%
Fair	2%	2%	11%	16%	5%	11%	7%	9%
Poor	0%	0%	1%	1%	1%	1%	0%	1%
Very Poor	0%	0%	0%	2%	0%	1%	0%	1%
Don't Know	0%	0%	0%	0%	1%	0%	0%	0%
No response	1%	1%	3%	4%	2%	3%	2%	3%
Ride I-95 Express before 95 Express Lanes Opened								
Yes	25%	24%	67%	66%	28%	27%	44%	41%
No	73%	74%	28%	25%	70%	69%	52%	53%
No response	2%	5%	5%	9%	2%	4%	4%	6%
Compare TT today to Dec 2008								
30 mins faster or more	36%	33%	16%	20%	44%	25%	22%	24%
15 to 29 min faster	29%	35%	38%	38%	30%	40%	35%	37%
5 to 14 min faster	14%	20%	30%	26%	10%	20%	26%	24%
1 to 4 min faster	0%	0%	1%	2%	2%	0%	1%	1%
About the same	9%	10%	9%	6%	3%	5%	8%	7%
Slower	4%	2%	4%	4%	9%	0%	4%	3%
No response	7%	0%	2%	5%	3%	10%	4%	4%

Data Source OnNAboard surveys
Data Time Period Week of 5/10/10

Report Group 6: Transit Signal Priority Reports in Broward and Miami-Dade

	(9) Pines Boulevard Transit Signal Priority - Traffic Queue Data Analysis	(10) Pines Boulevard Transit Signal Priority Evaluation - Transit
Report		

	Traffic		Transit	
	AM SB	PM NB	AM SB	PM NB
Speed	NA		NA	
Volume	NA		NA	
Occupancy	NA		NA	
Throughput	NA		NA	
Travel Time	NA		NA	
Delay Time	See Below		NA	
Travel Time	NA	Before TSP After TSP	0:28:10 0:22:54	0:42:21 0:41:22
Ridership	NA		NA	
Delay Time	NA	Before TSP After TSP	0:06:10 0:12:54	0:04:13 0:12:01
User Experience	NA		NA	

#9 **Location:** Hollywood/Pines Blvd **Data Collection Date:** "Before" data were collected on December 6 and 7, 2010(Tuesday and Wednesday); "After" data were collected on December 14

AM (7:00 am - 9:00 am)		Measurements (Field Measured, 15-second Interval)					
Intersections	Approaches	Average Queue		95 Percentile Queue		Maximum Queue	
		Before	After	Before	After	Before	After
I-95 Ramps	Northbound	8.3	8.3	22	23	41	32
	Westbound	14	17.4	46	48	80	86
Park Road	Northbound	6.9	7.5	17	22	21	28
	Southbound	9.6	9	22	21	30	34
35th Ave	Northbound	0.8	1.1	3	4	5	8
	Southbound	2.3	2.8	6	8	12	12
46th Ave	Northbound	3.5	4.2	10	11	14	14
	Southbound	5.8	5.7	14	13	21	16
Palm Ave	Northbound	11.1	10.3	30	25	40	47
	Southbound	28.1	38.6	83	86	92	116

PM (4:00 pm - 6:00 pm)		Measurements (Field Measured, 15-second Interval)					
Intersections	Approaches	Average Queue		95 Percentile Queue		Maximum Queue	
		Before	After	Before	After	Before	After
NB I-95 Interchange R	Northbound	12	10.9	29	23	45	32
	Westbound	14.4	16.8	42	42	59	47

Report Group 6: Transit Signal Priority Reports in Broward and Miami-Dade

Park Road	Northbound	10	9.1	23	22	30	35
	Southbound	15.1	18.3	32	50	70	75
35th Ave	Northbound	1.1	1.5	3	4	6	6
	Southbound	3.5	3.3	9	8	16	14
46th Ave	Northbound	5.1	4.5	12	11	16	15
	Southbound	6	6.4	14	18	20	35
Palm Ave	Northbound	29.4	22.8	58	45	75	66
	Southbound	10.2	11	29	30	57	68

#10 **Location:** Hollywood/Pines Blvd **Data Collection Date:** "Before" data were collected on December 7, 8, and 9, 2010 (Tuesday, Wednesday, and Thursday); "After" data were collected on December 14, 15, and 16, 2010 (Tuesday, Wednesday, and Thursday)

AM Southbound Express Bus Travel Time and Delay Time (From Flamingo Rd. to Calle Largo Dr., approximately 9 miles)

Stops	Before TSP Travel Time Runs						After TSP Travel Time Runs								
	Travel Time Run 1	Travel Time Run 2	Travel Time Run 3	Travel Time Run 4	Travel Time Run 5	"Before TSP" Average	Travel Time Run 1	Travel Time Run 2	Travel Time Run 3	Travel Time Run 4	Travel Time Run 5	Travel Time Run 6	Travel Time Run 7	Travel Time Run 8	"After TSP" Average
Total Running Time	0:28:47	0:28:15	0:28:44	0:28:13	0:26:53	0:28:10	0:21:25	0:24:36	0:25:08	0:20:27	0:21:23	0:20:55	0:26:17	0:22:57	0:22:54
In Motion Time	0:20:59	0:21:25	0:24:31	0:21:10	0:19:12	0:21:27	0:19:22	0:17:58	0:18:07	0:16:48	0:15:14	0:18:03	0:21:38	0:17:47	0:18:07
Dwell Time	0:35	0:13	0:25	0:44	0:22	0:00:28	0:45	0:28	0:00	0:44	0:46	0:35	1:10	0:00	0:00:34
Signal Delay	6:47	6:37	3:48	6:19	7:19	0:06:10	1:18	6:10	7:01	2:55	5:23	2:17	3:29	5:10	0:04:13
Turn Out Delay	0:26	0:00	0:00	0:00	0:00	0:00:05	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00:00
Other Delay	0:00	0:00	0:00	0:00	0:00	0:00:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00:00

PM Northbound Express Bus Travel Time and Delay Time (From Golden Glades P&R Lot to C.B. Smith P&R lot, approximately 16.5 miles)

Stops	Before TSP Travel Time Runs						After TSP Travel Time Runs									
	Travel Time Run 1	Travel Time Run 2	Travel Time Run 3	Travel Time Run 4	Travel Time Run 5	Travel Time Run 6	"Before TSP" Average	Travel Time Run 1	Travel Time Run 2	Travel Time Run 3	Travel Time Run 4	Travel Time Run 5	Travel Time Run 6	Travel Time Run 7	Travel Time Run 8	"After TSP" Average
Total Running Time	0:40:06	0:45:39	0:47:36	0:43:48	0:39:21	0:37:35	0:42:21	0:37:18	0:39:31	0:42:25	0:37:43	0:36:30	0:48:00	0:42:41	0:46:52	0:41:22
In Motion Time	0:26:28	0:27:20	0:28:54	0:32:20	0:27:45	0:23:39	0:27:44	0:28:22	0:29:14	0:29:11	0:23:59	0:22:14	0:32:16	0:28:57	0:30:31	0:28:05
Dwell Time	1:08	3:09	0:29	0:25	2:46	1:50	0:01:38	1:18	0:38	2:41	0:53	1:14	0:46	0:39	1:09	0:01:10
Signal Delay	12:30	14:51	18:13	11:03	8:42	12:06	0:12:54	7:38	8:48	10:33	12:51	13:02	14:58	13:05	15:12	0:12:01
Turn Out Delay	0:00	0:00	0:00	0:00	0:08	0:00	0:00:01	0:00	0:51	0:00	0:00	0:00	0:00	0:00	0:00	0:00:06
Other Delay	0:00	0:19	0:00	0:00	0:00	0:00	0:00:03	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00:00

Data were collected both manually by SFCS and automatically via APC system.

Appendix B: Summary Charts

The purpose of Appendix B is to visually present the data provided by the 12 reports. These data summarizes four aspects of the 95 Express project, as listed below.

- I-95 HOV/MUL Lane Traffic Data Summary
- I-95 Express Bus User Experience Summary
- Pines Boulevard Express Bus Transit Signal Priority (TSP) Impact Studies Summary
- 95 Express Lane User Survey Results Summary

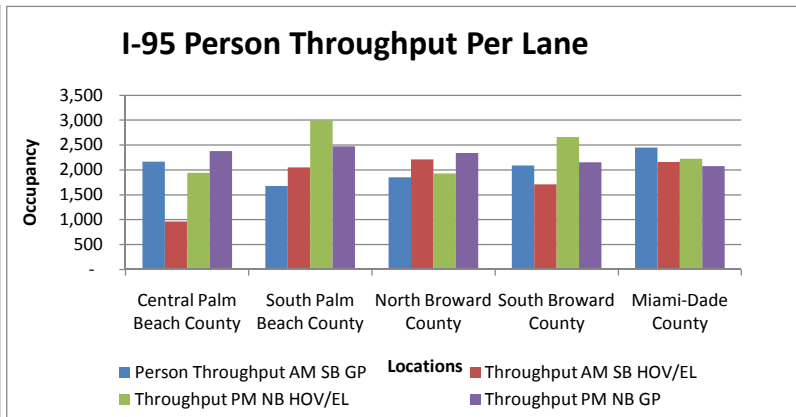
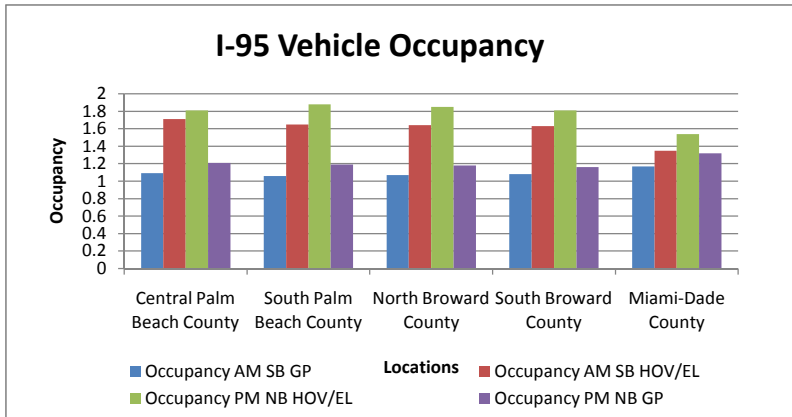
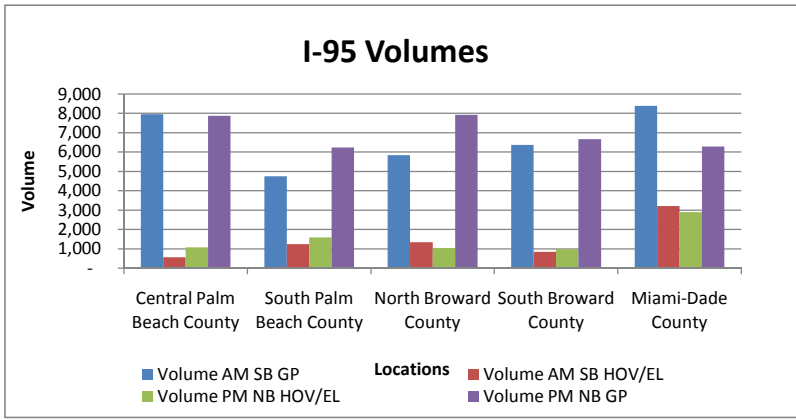
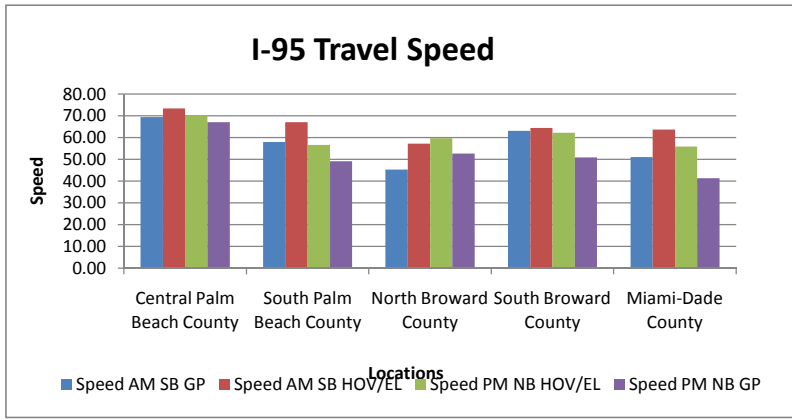
I-95 HOV/MUL Lane Traffic Data Summary

Reference:

11) 2010 I-95 High-Occupancy Vehicle Lane Monitoring Report

Locations	Volume					Speed				
	AM SB		PM NB			AM SB		PM NB		
	GP	HOV/EL	HOV/EL	GP	GP	HOV/EL	HOV/EL	GP	GP	
Central Palm Beach County	7,957 ↑	565 ↓	1,073 ↑	7,871 ↑	69.40 ↑	73.37 ↑	70.25 ↑	66.98 ↓		
South Palm Beach County	4,753 ↑	1,243 ↑	1,594 ↑	6,241 ↑	57.96 ↓	67.03 ↓	56.61 ↓	49.18 ↓		
North Broward County	5,840 ↑	1,349 ↓	1,042 ↓	7,923 ↑	45.28 ↓	57.20 ↓	59.68 ↑	52.69 ↑		
South Broward County	6,368 ↑	845 ↑	977 ↑	6,662 ↑	63.03 ↑	64.40 ↓	62.24 ↓	50.94 ↑		
Miami-Dade County	8,384 ↑	3,204 ↑	2,889 ↑	6,282 ↑	51.00 ↑	61.40 ↑	59.10 ↑	44.00 ↑		

Locations	Occupancy				Person Throughput			
	AM SB		PM NB		AM SB		PM NB	
	GP	HOV/EL	HOV/EL	GP	GP	HOV/EL	HOV/EL	GP
Central Palm Beach County	1.09 ↑	1.71 ↑	1.81 ↓	1.21 ↓	2,168 ↑	966 ↓	1,942 ↑	2,381 ↑
South Palm Beach County	1.06 ↓	1.65 ↑	1.88 ↑	1.19 ↓	1,679 ↓	2,051 ↑	2,997 ↑	2,476 ↑
North Broward County	1.07 ↓	1.64 ↑	1.85 ↑	1.18 ↓	1,850 ↓	2,212 ↑	1,928 ↓	2,337 ↑
South Broward County	1.08 ↓	1.63 ↑	1.81 ↓	1.16 ↑	2,087 ↑	1,712 ↓	2,663 ↑	2,152 ↑
Miami-Dade County	1.17 ↑	1.35 ↑	1.54 ↓	1.32 ↑	2,452 ↑	2,163 ↑	2,225 ↓	2,074 ↑



95 Express Bus User Experience Summary

Reference:

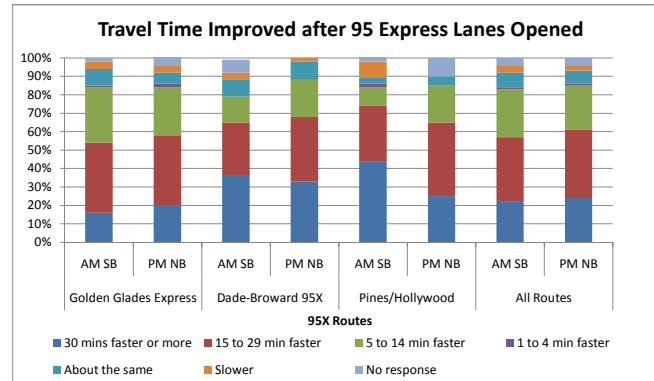
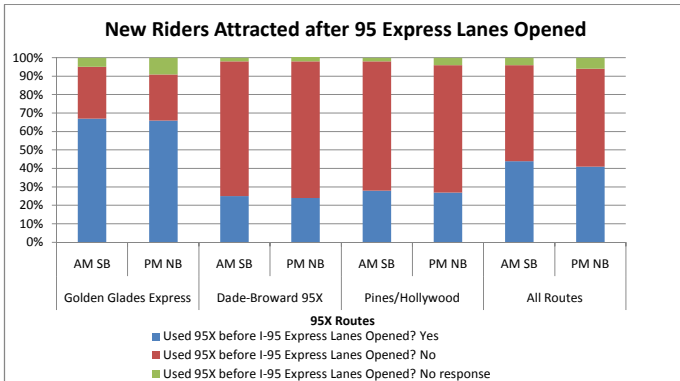
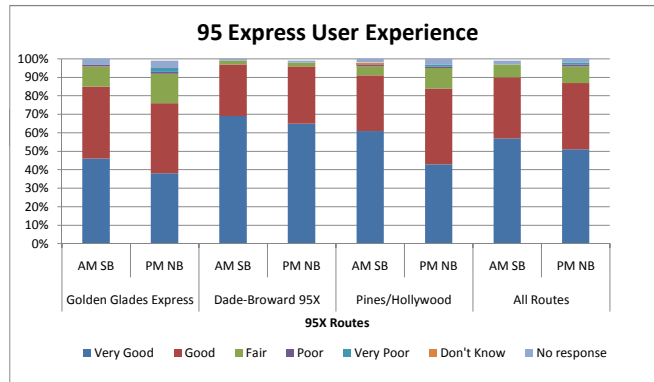
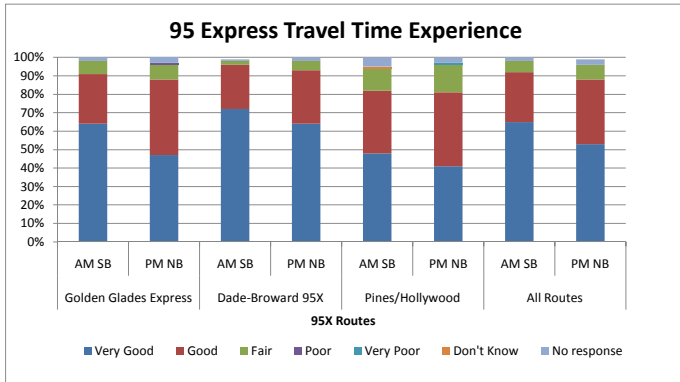
- 8) Miami UPA Phase 1 Transit Evaluation Report
- 5) 95 Express On-board Transit Survey Report - Phase 1A/1B, Kimley-Horn and Associates, July 2010.

95 Express Buses

Route	Peak Period at Peak Direction	Average Weekeday Ridership ⁽⁸⁾	Ridership per Bus ⁽¹¹⁾	Passengers ⁽⁹⁾	Surveys ⁽⁹⁾	% Surveys VS Passengers ⁽⁹⁾	Travel Time ⁽⁹⁾						
							Very Good	Good	Fair	Poor	Very Poor	Don't Know	No response
Golden Glades Express	AM SB	2067	26	591	290	49%	64%	27%	7%	0%	0%	0%	2%
	PM NB		21	364	182	50%	47%	41%	8%	1%	0%	0%	4%
Dade-Broward 95X	AM SB	631	19	393	281	72%	24%	2%	0%	0%	0%	1%	
	PM NB		15	317	207	65%	64%	29%	5%	0%	0%	2%	
Pines/Hollywood	AM SB	239	19	118	105	89%	48%	34%	12%	0%	1%	5%	
	PM NB		23	112	75	67%	41%	40%	15%	0%	1%	3%	
All Routes	AM SB	NA	NA	NA	NA	NA	65%	27%	6%	0%	0%	2%	
	PM NB		NA	NA	NA	NA	53%	35%	8%	0%	0%	3%	

Route	Peak Period at Peak Direction	User Experience ⁽⁹⁾							Used 95X before I-95 Express			Compare TT today to Dec 2008 ⁽⁹⁾						
		Very Good	Good	Fair	Poor	Very Poor	Don't Know	No response	Yes	No	No response	30 mins faster or more	15 to 29 min faster	5 to 14 min faster	1 to 4 min faster	About the same	Slower	No response
Golden Glades Express	AM SB	46%	39%	11%	1%	0%	0%	3%	67%	28%	5%	16%	38%	30%	1%	9%	4%	2%
	PM NB	38%	38%	16%	1%	2%	0%	4%	66%	25%	9%	20%	38%	26%	2%	6%	4%	5%
Dade-Broward 95X	AM SB	69%	28%	2%	0%	0%	0%	1%	25%	73%	2%	36%	29%	14%	0%	9%	4%	7%
	PM NB	65%	31%	2%	0%	0%	0%	1%	24%	74%	5%	33%	35%	20%	0%	10%	2%	0%
Pines/Hollywood	AM SB	61%	30%	5%	1%	0%	1%	2%	28%	70%	2%	44%	30%	10%	2%	3%	9%	3%
	PM NB	43%	41%	11%	1%	1%	0%	3%	27%	69%	4%	25%	40%	20%	0%	5%	0%	10%
All Routes	AM SB	57%	33%	7%	0%	0%	0%	2%	44%	52%	4%	22%	35%	26%	1%	8%	4%	4%
	PM NB	51%	36%	9%	1%	1%	0%	3%	41%	53%	6%	24%	37%	24%	1%	7%	3%	4%

NA: Not Applicable



Pines Boulevard Express Bus Transit Signal Priority (TSP) Impact Studies Summary

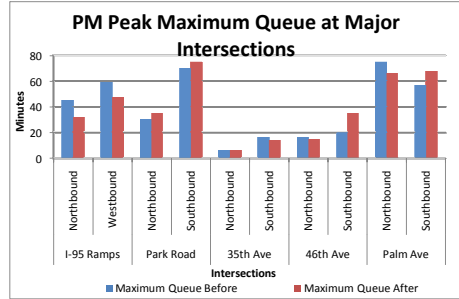
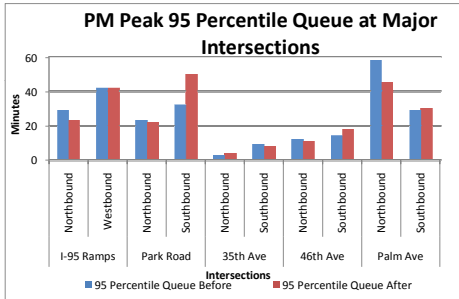
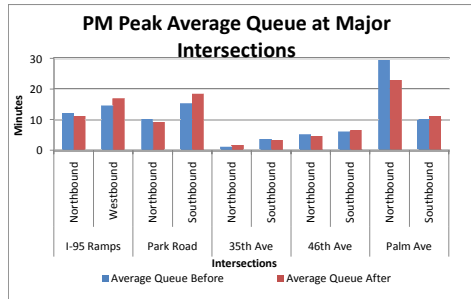
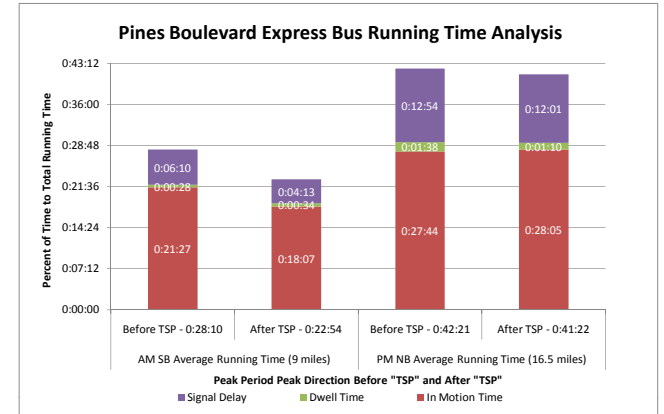
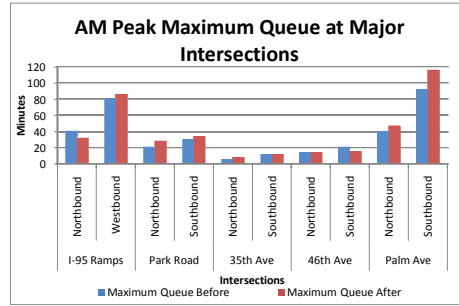
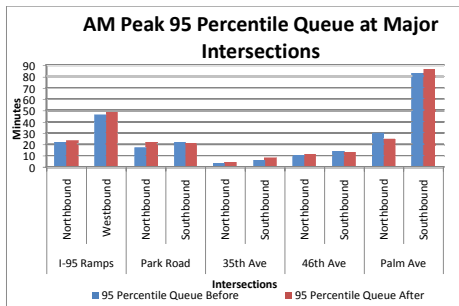
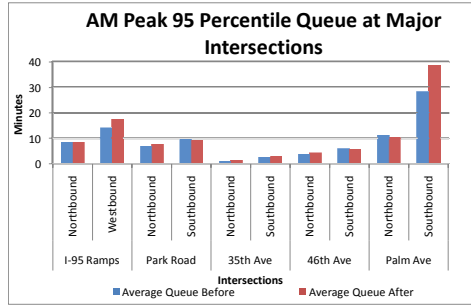
- Reference:
- 9) Pines Boulevard Transit Signal Priority - Traffic Queue Data Analysis
 - 10) Pine Boulevard Transit Signal Priority Evaluation - Transit

Pines Boulevard Traffic Queue Data Analysis⁽⁹⁾

Intersections	Approaches	AM SB Measurements						PM NB Measurements					
		Average Queue		95 Percentile Queue		Maximum Queue		Average Queue		95 Percentile Queue		Maximum Queue	
		Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
I-95 Ramps	Northbound	8.3	8.3	22	23	41	32	12	10.9	29	23	45	32
	Westbound	14	17.4	46	48	80	86	14.4	16.8	42	42	59	47
Park Road	Northbound	6.9	7.5	17	22	21	28	10	9.1	23	22	30	35
	Southbound	9.6	9	22	21	30	34	15.1	18.3	32	50	70	75
35th Ave	Northbound	0.8	1.1	3	4	5	8	1.1	1.5	3	4	6	6
	Southbound	2.3	2.8	6	8	12	12	3.5	3.3	9	8	16	14
46th Ave	Northbound	3.5	4.2	10	11	14	14	5.1	4.5	12	11	16	15
	Southbound	5.8	5.7	14	13	21	16	6	6.4	14	18	20	35
Palm Ave	Northbound	11.1	10.3	30	25	40	47	29.4	22.8	58	45	75	66
	Southbound	28.1	38.6	83	86	92	116	10.2	11	29	30	57	68

Pines Boulevard Express Bus Travel Time and Delay Time⁽¹⁰⁾

Stops	AM SB Average Running Time (9 miles)		PM NB Average Running Time (16.5 miles)	
	Before TSP - 0:28:10	After TSP - 0:22:54	Before TSP - 0:42:21	After TSP - 0:41:22
Total Running Time	0:28:10	0:22:54	0:42:21	0:41:22
In Motion Time	0:21:27	0:18:07	0:27:44	0:28:05
Dwell Time	0:00:28	0:00:34	0:01:38	0:01:10
Signal Delay	0:06:10	0:04:13	0:12:54	0:12:01
Turn Out Delay	0:00:05	0:00:00	0:00:01	0:00:06
Other Delay	0:00:00	0:00:00	0:00:03	0:00:00

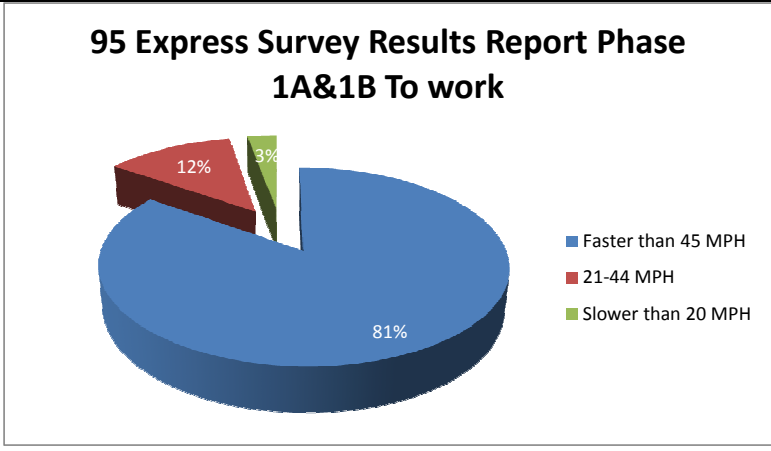


95 Express Lane User Survey Results Summary

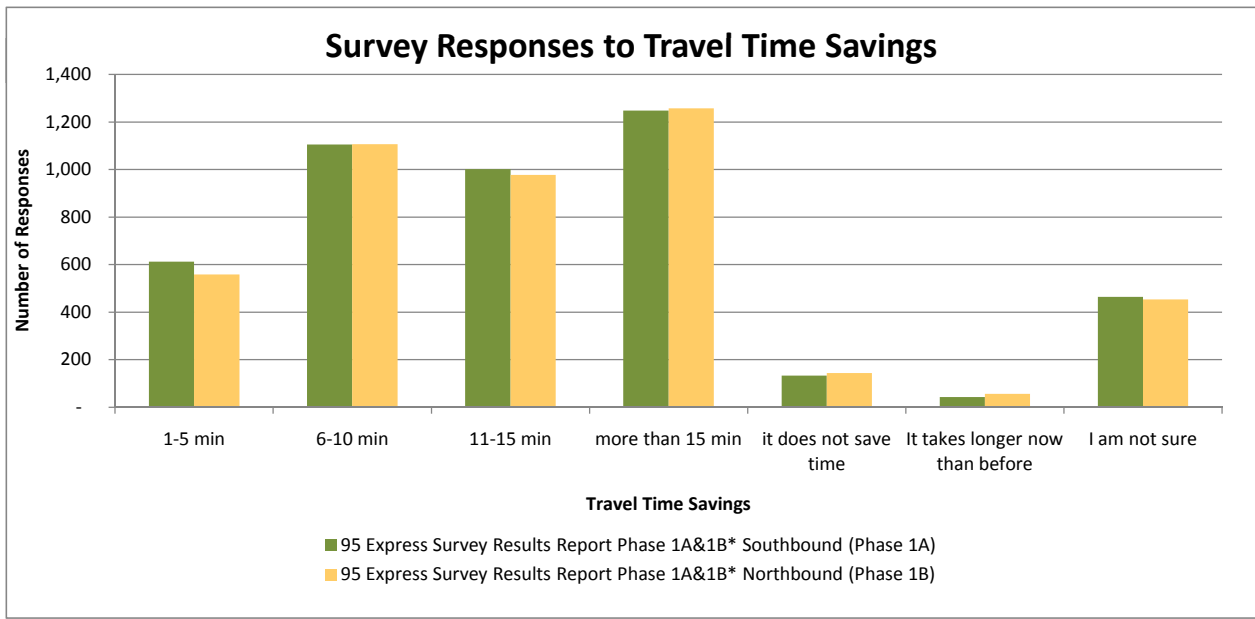
Reference:

6) 95 Express Survey Results Report for Phase 1A and 1B*

Survey Responses Distribution ⁽⁶⁾	95 Express Survey Results Report Phase 1A&1B*	
	To work	To home
Faster than 45 MPH	81%	73%
21-44 MPH	12%	16.60%
Slower than 20 MPH	3%	3.3%



Survey Responses Distribution ⁽⁶⁾	95 Express Survey Results Report Phase 1A&1B*	
	Southbound (Phase 1A)	Northbound (Phase 1B)
Travel Time Savings (# of Responses)		
1-5 min	613	559
6-10 min	1,106	1,107
11-15 min	1,002	977
more than 15 min	1,248	1,258
it does not save time	133	144
It takes longer now than before	43	56
I am not sure	464	454



*The survey results provided in this summary table are based on the result of a three month online survey. The report, however, reflects only the results from the first two month of the online survey.