Appendix C
Landside Analysis Terminal Access Roadways, Curbfronts, and Parking Short Term Improvements Volume I – Data Collection Report

Data Collection Report

Volume I
September 2016

Landside Analysis

Terminal Access Roadways, Curbfront, and Parking Short Term Improvements

FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT

Prepared for:
Broward County Aviation Department

Prepared by:
Kimley»Horn

040173031.1.208

EXECUTIVE SUMMARY

OVERVIEW

The Broward County Aviation Department (BCAD), with the assistance of Kimley-Horn and Associates, Inc. conducted an extensive data collection effort for the terminal access roadways, curbfront, and parking areas. The results of the data collection effort are summarized within and consist of the following components:

- Review of Available Studies
- Landside Inventory
- Curbfront Operational Observations

This data collection memorandum is the first deliverable of the ***Landside Analysis – Terminal Access Roadways, Curbfront and Parking Short-Term Improvement Study*** for the Fort Lauderdale-Hollywood International Airport (FLL). The objective of the study is to document the existing landside conditions, assess the terminal and access roadways to identify congestion points, and develop short-term improvements that can be implemented in the next five years to mitigate the identified congestion points. The data, analysis, and results of this study will feed directly into the FLL Master Plan Update. Specifically, the data collected within this memorandum will be shared with the Master Plan team and will form the basis for many areas of the Inventory chapter of the Master Plan Update.

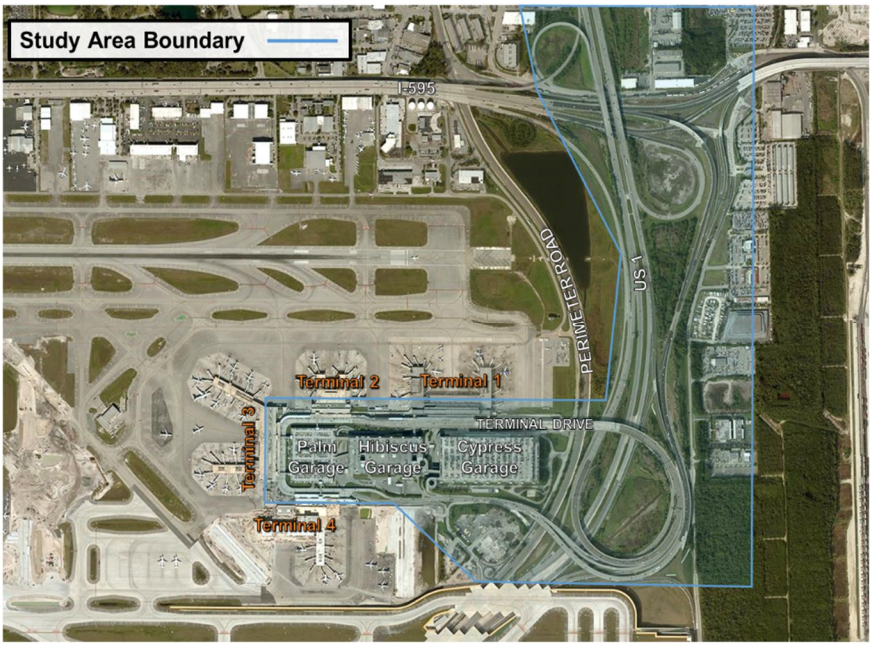
REVIEW OF AVAILABLE STUDIES

Over 30 studies and documents were provided by BCAD and reviewed. The studies fell into six different categories: airport wide studies, access road studies, parking studies, ground transportation studies, seaport/cruise studies, and regional studies. Relevant information from the studies pertinent to the Landside Analysis was summarized within this memorandum. Furthermore, the studies and documents aided in the development of the methodology and approach for the data collection efforts.

LANDSIDE INVENTORY

Landside facilities include the public areas with non-secure access, circulation and parking functions in and around the airport site. This report summarized the regional and terminal area access roadway network, the terminal curbfront, the rental car facility, and the parking facilities.

Significant coordination with BCAD Ground Transportation staff and the Ground Transportation Operations Provider, SP+, one of the main stakeholders, occurred to obtain



SOURCE: Pictometry Online (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure E-1: Study Area

available data. Related to the parking inventory, the following is summarized within this report:

- Parking entry and exit data, lot sizes, and occupancy data – *provided by SP+*
- Cell phone lot observations (dwell times, turnover, and occupancy) – *conducted by Kimley-Horn*
- Parking exit plaza processing times – *collected by Kimley-Horn*
- Rental car monthly transactions – *provided by BCAD*

The 2014 FLL Air Passenger Survey was also reviewed. The survey results were analyzed to determine key passenger characteristics such as time of arrival, travel party size, visitors, and mode of arrivals. Analysis results are provided within the Landside Inventory section of this report.

CURBFRONT OPERATIONAL OBSERVATIONS

An extensive traffic data collection effort was completed for this study. Seven day continuous traffic counts were conducted to determine the peak periods for key locations across the terminal roadways. Subsequently, a 48-hour continuous count was conducted concurrently with curbfront observations during the peak arrivals and departure periods. The terminal curbfront data collected includes:

- Vehicle Classification Counts
- Dwell Time Observations by Travel Mode
- Vehicle Occupancy (i.e. people getting into/out of vehicles)
- Loading/Unloading dwell times for a variety of vehicle types
- Enforcement of observed congestion
- Parking tram observations
- Pedestrian observations at crosswalks

Additional observations and congestion challenges noted during the data collection, complete with supporting photos, are presented within the General Observations section of this report.

NEXT STEPS

As previously mentioned, this memorandum is the first deliverable of the Landside Analysis Study. The data, analysis, and results will feed into the Master Plan, specifically the data inventory, facility requirements, demand/capacity, and short-term improvements, which will be developed as the project continues. Roadway and curbfront capacity is a measure of the maximum number of vehicles that can be accommodated within a given period of time.

The roadway traffic counts and terminal curbfront counts collected during operational observations will be used in future tasks of the Landside Analysis Study to calibrate the simulation model. The model is capable of incorporating transit, vehicular traffic, and pedestrians as a comprehensive performance analysis. Once calibrated, this model will be used to establish the existing and future demand/capacity and facility requirements for FLL. Based on the future capacity and facility requirements established by the model, short term improvements will be developed to address the existing facility constraints. These short term improvements will include recommendations for landside activities including valet operations, curbfront operational improvements, pedestrian improvements, and improved wayfinding. Ultimately three consolidated development concepts will be generated that will incorporate these short-term improvements. Up to three development concepts will then be prioritized and refined into one recommended short-term alternative.

Contents

Executive Summary i
Overview i
Review of Available Studies i
Landside Inventory i
Curbfront Operational Observations ii
Next Steps ii
1.0 Introduction 1
2.0 Landside Inventory 3
2.1 Review of Available Studies 3
2.2 Terminal Access Roadway Inventory 35
2.3 Curbfront Inventory 40
2.4 Signage Inventory 45
2.5 Parking Inventory 49
2.6 Public Transit Inventory 67
2.7 Passenger Inventory 68
3.0 Curbfront Operational Observations 76
3.1 Roadway Traffic Counts 76
3.2 Curbfront Vehicle Classification Counts 95
3.3 Lane Occupancy 101
3.4 Vehicle Occupancy and Dwell Times 102
3.5 Parking Tram Operations 108
3.6 Pedestrian Observations 112
4.0 General Observations 114
5.0 Next Steps 120

Figures

Figure 1: Study Area – Fort Lauderdale Hollywood International Airport 2
Figure 2: Additive Concept – Option 1A 7
Figure 3: Redevelopment Concept – Option 2A 8
Figure 4: Redevelopment Concept – Option 2B 8
Figure 5: Redevelopment Concept – Option 2C 9
Figure 6: Redevelopment Concept – Option 2D 10
Figure 7: Central Processor – Terminal 1 Landside 12
Figure 8: Alternative 1A 14
Figure 9: Location #1 - Perimeter Road, Near the I-595 Overpass 18
Figure 10: Location #2 - Intersection of Perimeter Road and SW 12th Avenue 19
Figure 11: Study Area 22
Figure 12: Re- Utilization of Hibiscus Garage – Ground Level 29
Figure 13: Cruise Ship Passenger Processing Facility, Cypress Alternative 30
Figure 14: Parking Layout Hibiscus Level 2 34
Figure 15: Terminal Access Roadways 36
Figure 16: Phase 3 Express Lanes Project Limits 37
Figure 17: Curbfront Access Roadways 38
Figure 18: Curbfront Layout - Lower Level (Arrivals) 41
Figure 19: Curbfront Layout - Upper Level (Departures) 42
Figure 20: Roadway Documented Wayfinding – Upper Level (Departures) 47
Figure 21: Roadway Documented Wayfinding – Lower Level (Arrivals) 48
Figure 22: Hibiscus/Cypress Entry and Employee Access 49
Figure 23: Parking Options at FLL 50
Figure 24: Curbfront Valet Operations 51
Figure 25: Valet Entry Checkpoint Booth 52
Figure 26: Valet Carwash Area 53

Figure 27: Parking Access 55
Figure 28: Secondary Parking Access 55
Figure 29: Average Monthly Percent Overnight Utilization by Parking Designation – November 2015 57
Figure 30: Average Percent Utilization for Onsite Garages – November 2015 57
Figure 31: Average Percent Utilization by Parking Designation – March 2015 58
Figure 32: Average Percent Utilization for Onsite Garages – March 2015 59
Figure 33: Consolidated Exit Plaza 60
Figure 34: Cell Phone Lot Overflow Area 62
Figure 35: Employee Entry and Exit Distribution (Cypress Garage) – November 2015 64
Figure 36: Employee Entry and Exit Distribution (Cypress Garage) – March 2015 65
Figure 37: Airline Distribution 68
Figure 38: Concourse Distribution 69
Figure 39: Passenger Early Arrival Distribution Curve (to Terminal) 73
Figure 40: Trip Purpose Distribution 74
Figure 41: Mode of Arrival Distribution 75
Figure 42: Two-Day Count Locations 81
Figure 43: Access Roadways, Daily Traffic Volume 86
Figure 44: Access Roadways, AM Peak Hour Traffic Volume 87
Figure 45: Access Roadways, PM Peak Hour Traffic Volume 88
Figure 46: Lower Level (Arrivals), Daily Traffic Volume 89
Figure 47: Lower Level (Arrivals), AM Peak Hour Traffic Volume 90
Figure 48: Lower Level (Arrivals), PM Peak Hour Traffic Volume 91
Figure 49: Upper Level (Departures), Daily Traffic Volume 92
Figure 50: Upper Level (Departures), AM Peak Hour Traffic Volume 93
Figure 51: Upper Level (Departures), PM Peak Hour Traffic Volume 94
Figure 52: Uber Geozone 98

Figure 53: Passenger Boarding Distribution – November 19, 2015 109
Figure 54: Tram Designated Pick-up and Drop-off Locations (Hibiscus Parking Garage) 110
Figure 55: Tram Designated Pick-up and Drop-off Locations (Palm Parking Garage) 111
Figure 56: Pedestrians Jaywalking, Terminal 1, Upper Level (Departures) 114
Figure 57: Taxi Congestion Point, GTA-1, Lower Level (Arrivals) 115
Figure 58: Blocked Taxi Exit, GTA-2, Lower Level (Arrivals) 115
Figure 59: Terminal 4 Valet Parking Congestion, GTA-3, Upper Level (Departures) 116
Figure 60: Pedestrian Signs 117
Figure 61: Blocked Garage Entrance 117
Figure 62: Pedestrian Crosswalk on Terminal 4, Lower Level (Arrivals) 118
Figure 63: Lower Level Ceiling Lighting 118
Figure 64: Cell-Phone Lot Wayfinding 119
Figure 65: Cell-Phone Lot Occupancy 119

Tables

Table 1: Roadway Inventory Overview 39
Table 2: Curbfront Inventory Overview, Terminal Locations 40
Table 3: Curbfront Inventory Overview, GTA Curbfronts 45
Table 4: Off-site Parking Providers 54
Table 5: Parking Space Inventory – November 2015 56
Table 6: Parking Space Inventory – March 2015 58
Table 7: Economy Lot Length of Stay – November 2015 59
Table 8: On-airport Self-Parking Length of Stay – November 2015 60
Table 9: Exit Plaza Processing Times 61
Table 10: Cell Phone Lot Average Statistics – Two-Hour Period 61
Table 11: Average Hourly Employee Parking Usage – November 2015 63
Table 12: Rental Car Contracts 66
Table 13: Public Transit Inventory 67
Table 14: Average Travel Party Size 70
Table 15: Well Wisher Ratio, by Airline 71
Table 16: Baggage Distribution, by Airline 72
Table 17: Summary of Seven-Day Traffic Counts 77
Table 18: Absolute Two-Hour Peak Periods – Seven-Day Counts 77
Table 19: Roadway Traffic Count Locations (42 Total Locations) 79
Table 20: Thursday Peak Hour Roadway Traffic Count Volumes 82
Table 21: Friday Peak Hour Roadway Traffic Count Volumes 84
Table 22: Vehicle Classifications 95
Table 23: Curbfront Vehicle Classification Counts – Upper Level (Departures) – AM Peak 99
Table 24: Curbfront Vehicle Classification Counts – Lower Level (Arrivals) – PM Peak 100
Table 25: Terminal Lane Occupancy 101
Table 26: Vehicle Occupancy and Dwell Times – Rental Car Center (RCC) – AM Peak 103

Table 27: Vehicle Dwell Times – Ground Transportation Area (Lower Level) – PM Peak 103

Table 28: Vehicle Occupancy – Ground Transportation Area (Lower Level) – PM Peak 104

Table 29: Vehicle Occupancy and Dwell Times – Taxi Staging Area (Lower Level) – PM Peak 104

Table 30: Vehicle Occupancy – Curbfront Area, Upper Level (Departures) – AM Peak 105

Table 31: Average Occupancy – Curbfront, Upper Level (Departures) – AM Peak 105

Table 32: Vehicle Dwell Time – Curbfront Area, Upper Level (Departures) – AM Peak 106

Table 33: Vehicle Occupancy– Curbfront Area, Lower Level (Arrivals) – PM Peak 106

Table 34: Average Occupancy – Curbfront Area, Lower Level (Arrivals) – PM Peak 107

Table 35: Average Dwell Time by Vehicle Classification – Curbfront Area, Lower Level (Arrivals) – PM Peak 107

Table 36: Parking Tram Ridership Survey 108

Table 37: Pedestrian Observation Survey – Curbfront, Upper Level (Departures) – AM Peak Period 112

Table 38: Pedestrian Observation Survey – Curbfront, Lower Level (Arrivals) – PM Peak Period 113

Appendix

Appendix A: Seven-Day Traffic Counts

Appendix B: Two-Day Traffic Counts

Appendix C: Vehicle Classification Counts

Appendix D: Lane Occupancy Observations

Appendix E: Vehicle Occupancy and Dwell Time Observations

Appendix F: Parking Tram Observations

Appendix G: Pedestrian Observations

Appendix H: Data Collection Stakeholder Presentation

1.0 INTRODUCTION

In coordination with the Fort Lauderdale-Hollywood International Airport (FLL) Master Plan, the Landside Analysis Study documents the existing landside conditions at FLL, assessing terminal and access roadways, curbfront operations, and parking for the purpose of developing short-term improvements to mitigate congestion in the next five years. Landside facilities include the non-secure access, circulation, and parking facilities in and around the airport. This report summarizes the on-airport surface transportation data collected during Fall 2015.

A data collection plan was developed to coordinate data collection efforts and activities between the update of the Master Plan and this Landside Analysis. A series of meetings were held with key stakeholders identified by the Broward County Aviation Department (BCAD) to discuss current operational characteristics, available data, and issues associated with specific airport activities. The data collection plan was also reviewed during stakeholder engagement meetings.

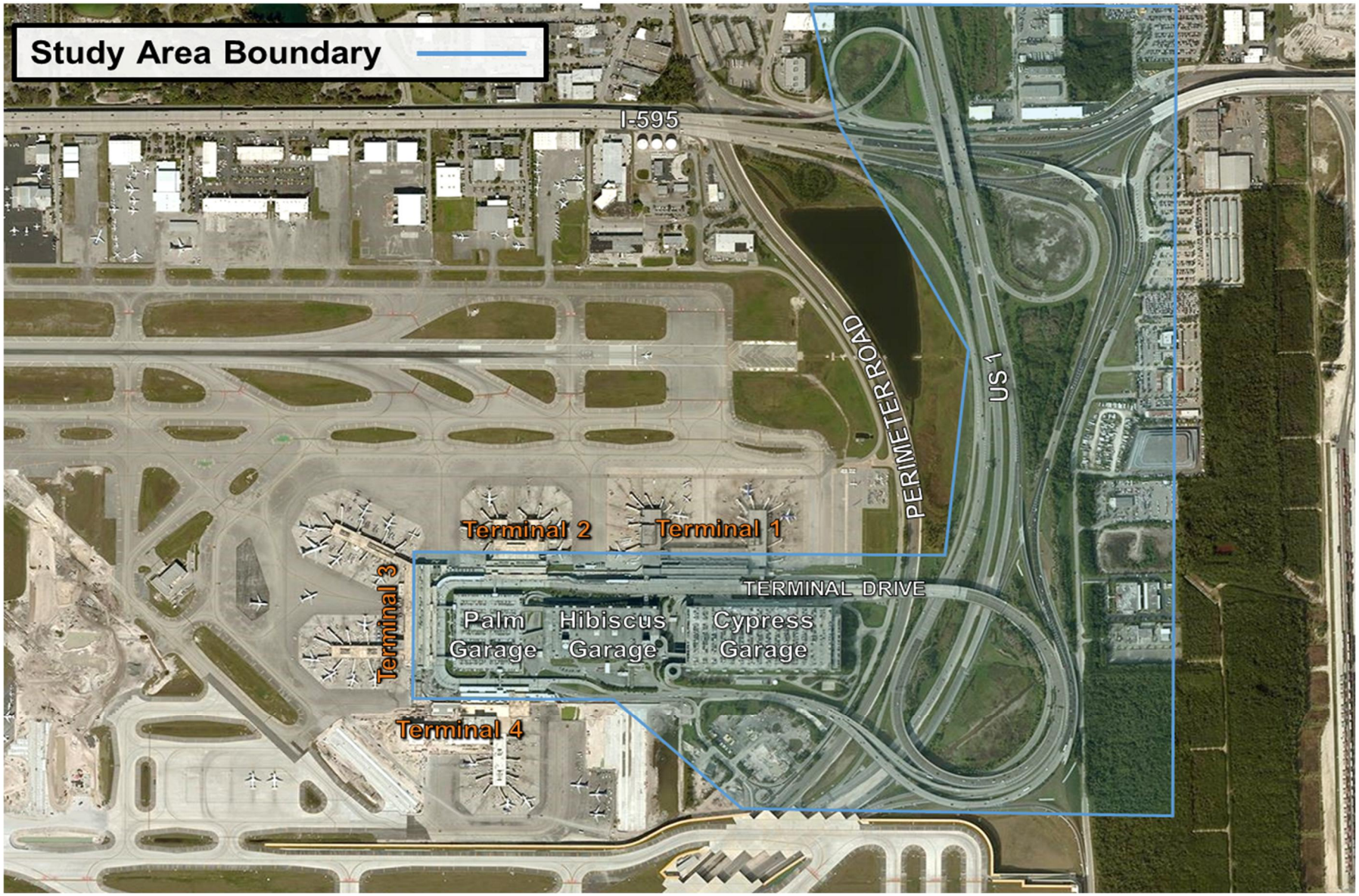
The data collection is divided into two categories: Landside Inventory and Curbfront Operational Observations. The Landside Inventory section includes a review of previously completed studies conducted at FLL and a summary of the characteristics of the areas immediately adjacent to the airport such as the terminal access roadways, airport parking facilities, and terminal curbfronts. The Curbfront Operational Observations section includes information on traffic counts and the curbfront operations. This section summarizes operational observations conducted in November 2015 including vehicle classification counts, dwell times, vehicle occupancy, pedestrian activity, loading and unloading information, and parking garage tram observations.

The summary inventory data collected and summarized in this report will be used to complete the ALPS™ (Advanced Land Transportation Performance Simulation™) model of the existing landside operations. ALPS is a comprehensive simulation model that models a variety of travel modes (e.g. private autos, buses, shuttles, pedestrians, etc.) portraying the effects each mode has upon the others. ALPS has been developed and enhanced over the last 35 years principally through the analysis of major transportation facilities around the world, including many of the largest airports and intermodal passenger rail terminals. ALPS can incorporate transit, traffic, freight, and pedestrians as a comprehensive multimodal performance analysis. The trip generation is based on the flight schedule, capturing the peak periods unique to FLL. Using ALPS, a facility can be evaluated the way it operates – as a system – rather than a group of unrelated parts.

The roadway traffic counts and terminal curbfront counts collected during operational observations will be used in future tasks to calibrate the simulation model. Once calibrated, the model will be used to establish the existing and future demand/capacity and facility requirements for FLL. Kimley-Horn and Associates will model the existing condition curbfronts, simulating passenger capacity and flow. The ALPS model will also be used to replicate the recommended short-term improvements.

The study area is shown in Figure 1.

Figure 1: Study Area – Fort Lauderdale Hollywood International Airport



SOURCE: Pictometry Online (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

2.0 LANDSIDE INVENTORY

2.1 REVIEW OF AVAILABLE STUDIES

Over 30 studies and documents were provided by BCAD and reviewed as part of this task. The studies were categorized into seven areas. The studies and their categories are listed below, chronologically within each category. Although all studies were reviewed, only the applicable studies were summarized within this report. The studies that were not summarized were identified as such below. Summary statements that provide a synopsis of next steps taken by BCAD are provided at the conclusion of each report summary.

Airport Wide Studies

- *Ft. Lauderdale-Hollywood International Airport, Master Plan Update* (Jacobs Consultancy/Leigh Fisher Associates; 2010)
- *Central Processor Development Strategy, Fort Lauderdale-Hollywood International Airport* (Leigh Fisher Associates; September 16, 2011)
- *Fort Lauderdale-Hollywood International Airport, Airport Layout Plan Update* (Leigh Fisher Associates; August 2013); ***report not summarized***, limited relevance to study
- *Fort Lauderdale-Hollywood International Airport, Signage and Wayfinding Master Plan* (Gresham Smith and Partners; January 2014)
- *Ft. Lauderdale – Hollywood International Airport, 2014 Passenger Survey, Technical Memorandum* (Landrum & Brown; September 2014); ***report not summarized***, but specific, applicable data referenced throughout document

Access Road Studies

- *Perimeter Road Study, Technical Memorandum* (Leigh Fisher Associates; September 23, 2011)
- *Analysis of the Southbound Exit Roadway Fort Lauderdale – Hollywood International Airport* (Leigh Fisher Associates; July 8, 2012)
- *Perimeter Road Analysis, Fort Lauderdale-Hollywood International Airport, Technical Memorandum* (Leigh Fisher Associates; July 8, 2012)
- *Roadway Planning Integration, Final Report* (Leigh Fisher Associates; November 30, 2012)
- *Perimeter Road Improvements, Technical Memorandum* (Reynolds Smith and Hills, Inc.; March 13, 2013)
- *Exit Ramp Assessment Fort Lauderdale-Hollywood International Airport* (Kimley-Horn and Associates, Inc; August 2014) – study prepared for the Florida Department of Transportation (FDOT)
- *Environmental Evaluation of Ramp G to US 1, Technical Memorandum* (Landrum & Brown; October 20, 2014)
- *US1 – Griffin Road Intersection Study* (Kimley-Horn and Associates, Inc.; December 2015) - study prepared for the FDOT

Parking Studies

- *Fort Lauderdale-Hollywood International Airport – ADA/Accessibility Review of Existing Parking Systems* (Pamela Pflueger & Associates, Inc.; 1996)
- *Facility Condition Assessment Report for Hibiscus Garage and Cypress Garage/Rental Car Center (RCC) Final Report* (Reynolds Smith and Hills, Inc.; November 19, 2012)
- *Long-Term Terminal-Area Parking Needs Study, Fort Lauderdale-Hollywood International Airport* (Leigh Fisher Associates; March 29, 2013)
- *Rental Car Operations and Capacity Study, Fort Lauderdale-Hollywood International Airport* (Leigh Fisher Associates; January 2015)

Ground Transportation Studies

- *Operating Guidelines for Commercial Ground Transportation at Fort Lauderdale-Hollywood International Airport* (March 1, 2014; http://www.broward.org/Airport/Transportation/Documents/GroundTransportatingOperatingGuidelinesMay132014.pdf)

Seaport/Cruise Studies

- *Broward County Intermodal Center and People Mover System Fort Lauderdale-Hollywood International Airport and Port Everglades, Preliminary Engineering Report Draft* (Lea+Elliot; June 2009)
- *Near-Term Cruise Ship Passenger Processing Facility Programming Study* (Leigh Fisher Associates; March 2012)
- *Near-Term Cruise Ship Passenger Processing Facility – Cypress Alternative Study* (Leigh Fisher Associates; September 13, 2012)
- *Port Everglades 2014 Master/Vision Plan* (AECOM; Adopted on June 24, 2014); ***report not summarized***, limited relevance to study
- *Cruise Operations and Ground Transportation Handbook, 2014 – 2015 Season* (www.broward.org/Airport/Transportation/Documents/CruiseOperationsHandbook20142015.pdf)

Regional Studies

- *Commitment 2040, The Long Range Transportation Plan for Broward County* (Broward County Metropolitan Planning Organization; Adopted December 11, 2014)
- *Broward County Transportation Improvement Program, FY 2014/2015 – FY 2018/2019* (Broward County; July 2014, Adopted December 11, 2015)

Supplementary Documents

In addition to the reports, supporting data and other documents were provided including:

- Automated Vehicle Identification (AVI) system data
- Flight schedules from the Gate Management system and historical flight activity information; document not summarized; to be documented in future Demand/Capacity Technical memorandum
- FDOT studies/design drawings for Planned Improvement Projects along US Route 1 (US 1), Interstate 95 (I-95), Interstate 595 (I-595), and local state roads

- Available As-Built Plans of FLL Roadways; document not summarized, limited relevance to study
- Parking facilities layout drawings
- Landside facilities construction and operation cost estimates

The studies and documents summarized provided information pertinent to the Landside Analysis and aided in the development of the methodology and approach for the data collection efforts. Select studies from the review are summarized in the following sections.

AIRPORT WIDE STUDIES

Fort Lauderdale-Hollywood International Airport, Master Plan Update (Summary)

Jacobs Consultancy; 2010

The intent of the Master Plan Update was to provide a comprehensive plan to guide and coordinate the development of Terminal Area Airport facilities in accordance with the process and schedule of the Environmental Impact Statement (EIS) and; to provide information on short-term development decisions by identifying the relationship between short-term decisions and longer-term options affecting the future potential of the Airport.

The objective of the Master Plan Update was to deliver new and improved access and passenger terminal facilities. These facilities include Terminal 1 with 18 gates, the Hibiscus Garage, the Rental Car Center and Cypress Garage, the double-decking of the inbound roadway, and a new interchange between the Airport roadway system, US 1, and I-595. The year 2025 was selected as the horizon for defining long-term facility needs. This year was used as a baseline to determine the passenger vehicle parking requirements, maximum number of additional gates, and airfield development requirements. The study also took into account the simultaneous schedule of the EIS for the proposed South Runway Extension. Key findings from the 2010 Master Plan update are summarized below.

2010 Parking Conditions

The terminals are supplemented by three parking garages. The parking garages from west to east include:

- The Palm Garage - approximately 2,700 structured parking spaces on three levels
- The Hibiscus Garage - approximately 4,400 structured parking spaces on five levels
- The Cypress Garage - eight levels and approximately 4,200 structured parking spaces on the top four levels, and the consolidated rental car facilities on the first four levels

Parking Analysis

Based on previous analysis of parking demand patterns at FLL, a ratio of 175-200 parking spaces per gate was determined to be the best means of estimating a reasonable supply of parking spaces within the terminal complex. The previous analysis also established the need for an additional 30% of parking spaces for peak and holiday remote from the terminal complex, most likely in at-grade parking lots. Therefore, a total of about 18,000 spaces would be needed in the terminal area by 2025 to accommodate demand with service level approximately similar to those experienced today.

Parking Opportunities

The existing parking garages at FLL are very well located relative to industry standards, with relatively short walking distances to the terminal buildings. However, access and wayfinding are compromised due to conflicts in circulation and lack of coordinated movement systems within the parking garages. Demand analysis indicated a need for additional parking in the long-term. Potential sites were identified for the intermodal center within the entrance roadway helix and the Palm Garage. Redevelopment of the Palm Garage also offers an opportunity to redesign the roadway near Terminal 3 to improve traffic flow and to accommodate passenger processing capabilities in concert with a redeveloped terminal area.

Existing Roadway System

Access to the terminal complex is provided from US 1 and I-595 on the east side via a newly constructed interchange system. The roadway system is a double-decked five-lane roadway, except at Terminal 1 where there is an extra lane. There is a significant elevation difference at the upper level roadway between Terminal 1 and Terminal 2, which corresponds to the floor heights at these terminals.

The existing curbfront roadway turns at a radius of 90 degrees between Terminal 2 and Terminal 3 and between Terminal 3 and Terminal 4. The radii are tight and require a significant reduction in speed. This results in congestion at these locations during peak periods of activity. After the curbfront roadway passes Terminal 4, all outbound traffic, including parking and rental car exiting, merges together onto a single level, three-lane roadway. This results in congestion at peak periods.

Roadway Capacity Analysis

The findings of the 2010 Master Plan Update indicate increased capacity and other improvements to the roadway system, particularly in the vicinity of Terminals 2 and 3, will need to be in place within 10 years to avoid significant disruption of through traffic and curbfront vehicle traffic flow during peak periods. The existing roadway system, while adequate to meet short- and medium-term demand, is unlikely to meet long-term demand. Passenger service on the roadway and at the curbfront will continue to degrade over time. To address the long-term needs, alternative concepts were identified. These improvements include, at a minimum, modifications to the roadway geometry and additional vehicle lanes in the vicinity of Terminals 2 and 3 and are addressed in the following sections.

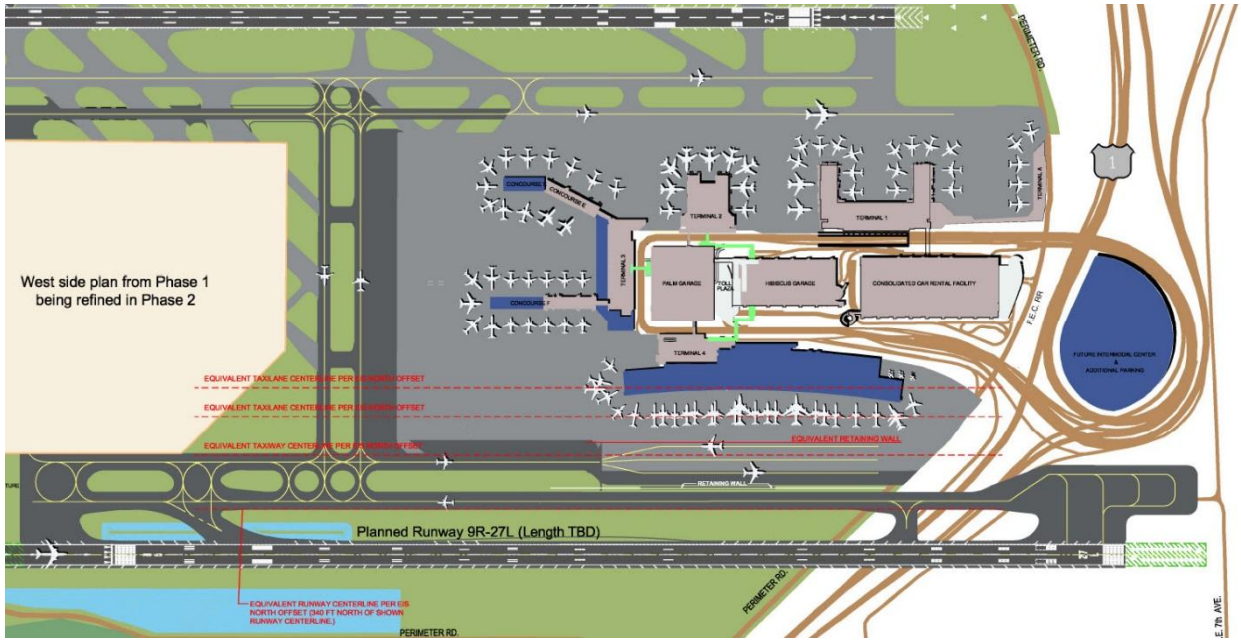
Master Plan Alternative Concepts

Five concept options were developed as part of the 2010 Master Plan Update and were coordinated with the recommendations within this study. The concept options were divided into two categories, the Additive Alternatives and the Redevelopment Alternatives. Of these two categories, the stakeholders' preferred alternatives were Option 1 A (Additive) and Option 2C (Redevelopment). Figures 2 – 6 illustrate the concepts which include:

Additive Concept – Option 1A

Option 1A includes proposed Concourse A, the Terminal 4 'International Gateway' terminal, extensions to existing Concourses E and F with an airside connection. This scenario represents a long-term incremental approach to terminal improvements which maintains the existing unit terminal configuration, and maximizes re-utilization of the majority of the existing terminal complex.

Figure 2: Additive Concept – Option 1A

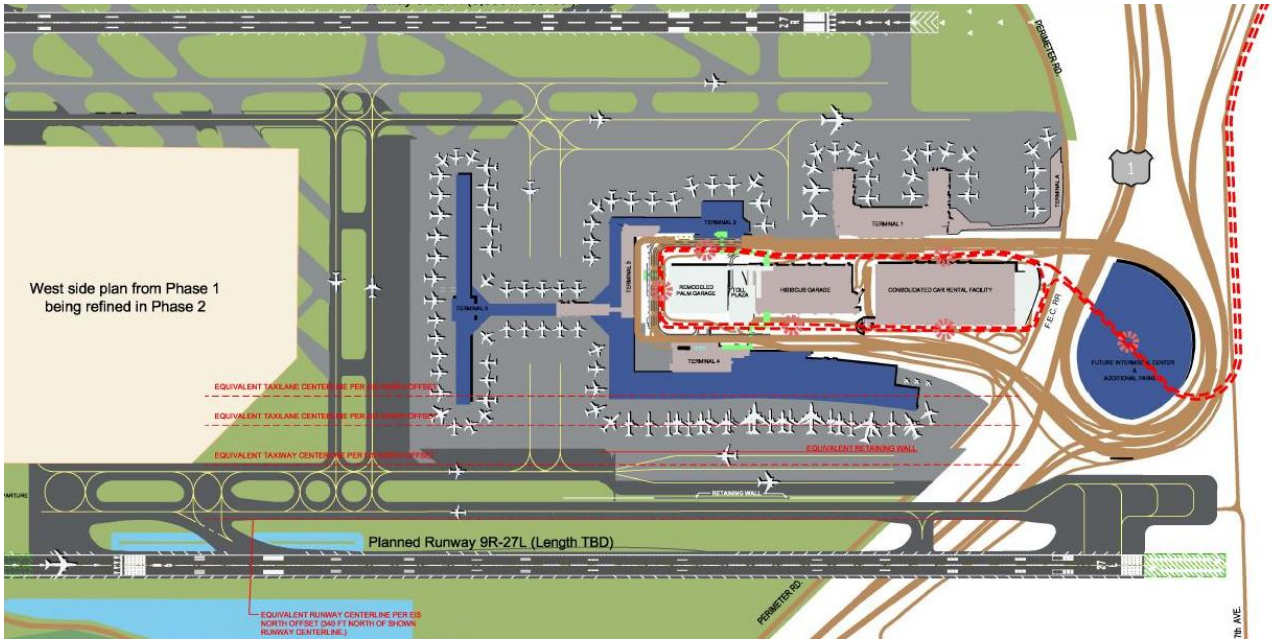


SOURCE: Master Plan Update (2010)
PREPARED BY: Jacobs Consultancy

Redevelopment Concept – Option 2A

Option 2A includes proposed Concourse A, a modification to the 'International Gateway' terminal concept to allow for integration with a connected terminal facility, the ultimate replacement of Concourses E and F with a new connected 'satellite' concourse west of the existing terminal complex, the redevelopment of the Palm Garage as an upgraded parking facility with commercial pick-up / drop-off on level one, and new parking facilities at the intermodal center site. This option also will include a people mover from Port Everglades. Linkage of the existing unit terminals in this option provides better curbfront presentation for passenger pick-up and drop-off.

Figure 3: Redevelopment Concept – Option 2A

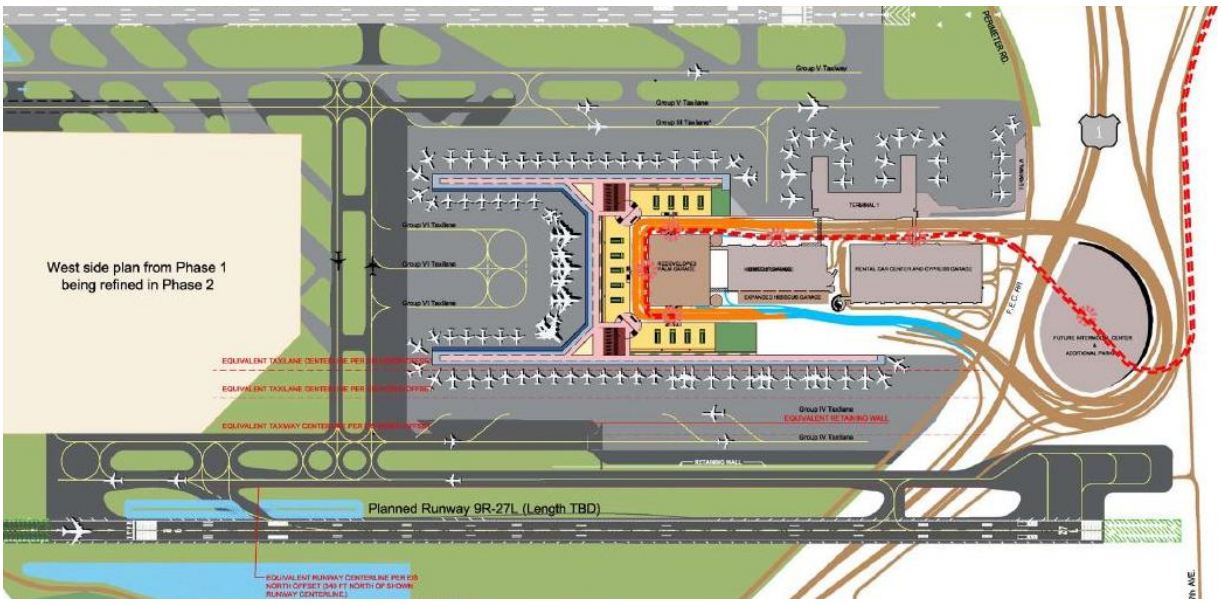


SOURCE: Master Plan Update (2010)
PREPARED BY: Jacobs Consultancy

Redevelopment Concept – Option 2B

This option also includes a redevelopment of the Palm Garage as an upgraded parking facility with commercial pick-up / drop-off on level one, a people mover from Port Everglades, and, new parking facilities at a proposed intermodal center site. Linkage of the new unit terminals in this option provides better curbfront presentation for passenger pick-up and drop-off.

Figure 4: Redevelopment Concept – Option 2B

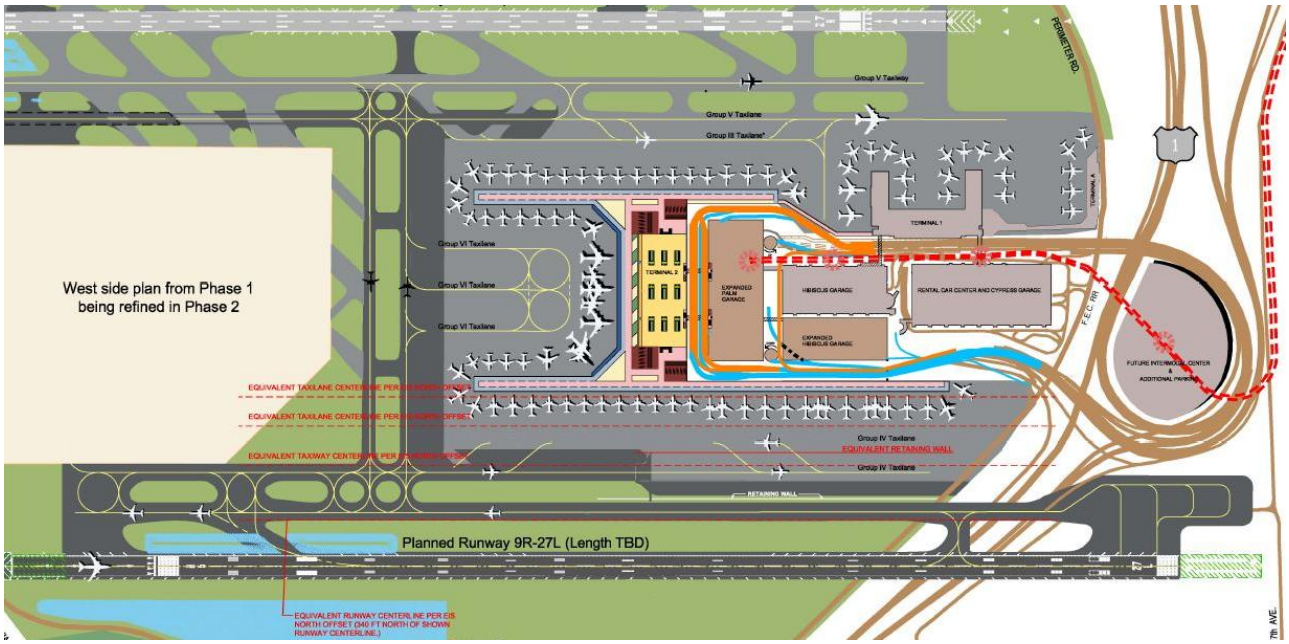


SOURCE: Master Plan Update (2010)
PREPARED BY: Jacobs Consultancy

Redevelopment Concept – Option 2C

Option 2C includes the proposed Concourse A, upgrades to Terminal 1, and ultimate replacement of Terminals 2, 3, and 4 with a new central processor at the west end of a redeveloped access roadway and parking system, linking a parallel concourse configuration for optimized airfield access. This option also includes the redevelopment of the Palm Garage as an upgraded parking facility with commercial pick-up / drop-off on level one, and the option of an expansion of the Hibiscus Garage, thereby maximizing the potential of terminal area parking facilities. This option also will include a people mover from Port Everglades. Development of new parking facilities at a proposed intermodal site would not be required in this scheme due to the increased parking capacity afforded in the terminal area by the central processor concept. A development scenario was adopted that maintained a common short-term development plan to address the issues and initiatives critical to the Airport over a 10 year timeframe. Redevelopment Option 2C ultimately became the base for the County's preferred Redevelopment option.

Figure 5: Redevelopment Concept – Option 2C

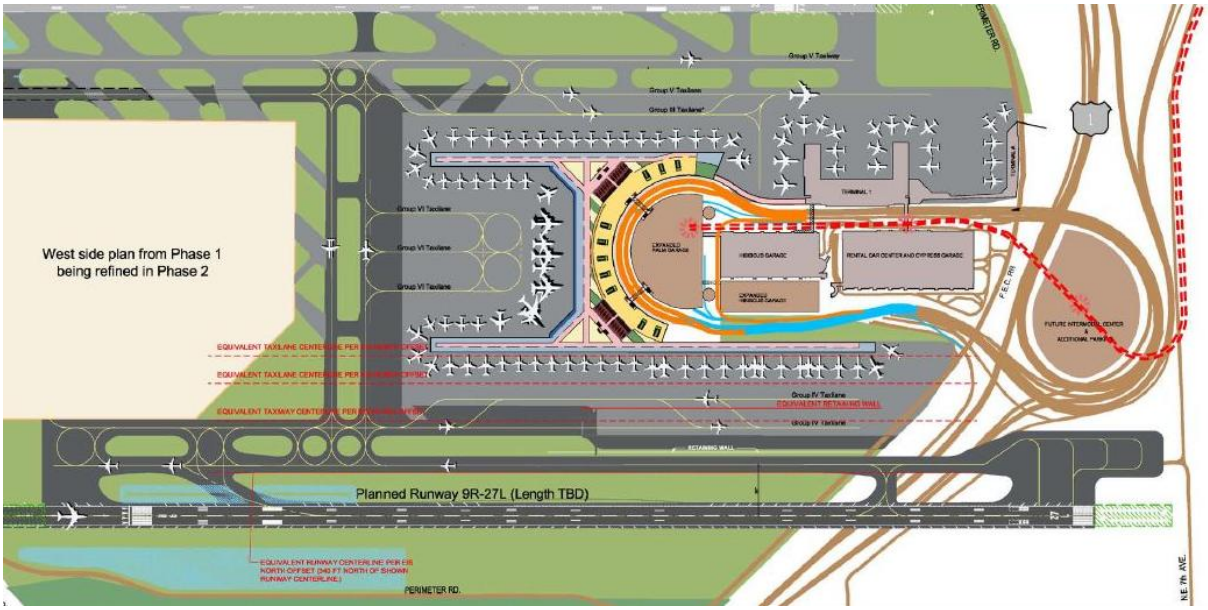


SOURCE: Master Plan Update (2010)
PREPARED BY: Jacobs Consultancy

Redevelopment Concept – Option 2D

Under Option 2D, a continuous crescent shaped roadway scheme was developed to maximize curb frontage, which becomes the driver for the terminal configuration. This option also includes a redevelopment of the Palm Garage as an upgraded parking facility with commercial pick-up / drop-off on level one, a people mover from Port Everglades, and, the option of an expansion of the Hibiscus Garage.

Figure 6: Redevelopment Concept – Option 2D



SOURCE: Master Plan Update (2010)
PREPARED BY: Jacobs Consultancy

Note: BCAD proceeded with the Additive Concept – Option 1A, based upon Option 1A, fulfilling the majority of the recommendations. Among the recommendations not implemented include the improvement of the roadway system and the people mover system.

Central Processor Development Strategy, Fort Lauderdale-Hollywood International Airport (Summary)

Leigh Fisher Associates; September 16, 2011

This report documented the viability of the Central Processor concept in the area of the Palm Garage facility. The process included stakeholder input, an update of the Master Plan terminal area facility requirements, development of alternatives, and a high-level evaluation including preparation of rough order-of-magnitude cost estimates.

The primary issues that were to be resolved were:

- Management of cruise ship passenger and baggage processing
- Traditional passenger processing areas
- Passenger amenities
- Revenue generating opportunities
- Operational improvements
- Roadway and curbfront congestion
- Ground transportation operations
- Airport property development
- Additional parking spaces in the Palm garage (seven parking levels)
- Consolidate security checkpoint for T2, T3, and T4

The document identified two alternatives to redevelop the Palm Garage into a centralized passenger processing facility, both of which were similar in function. The alternatives were as follows:

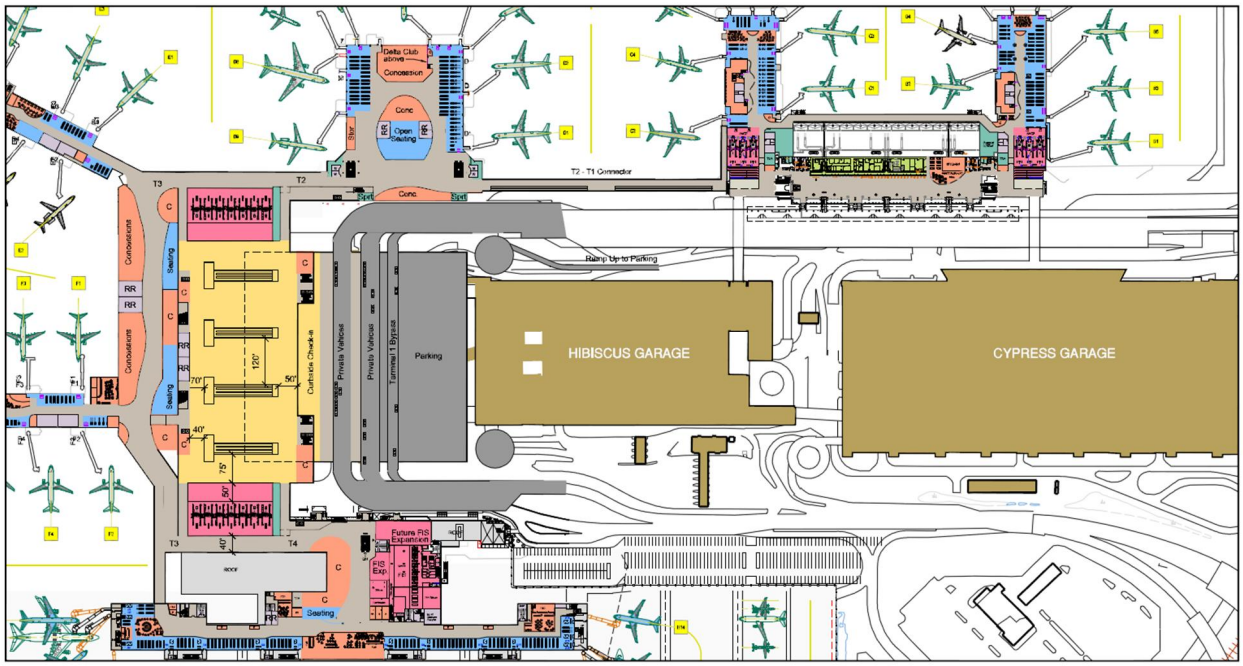
1) Conversion of Terminal 1 into a secure concourse with an airside connection to the central processing facility; and

2) Terminal 1 would remain an independent functioning terminal with a landside connection to the central processor.

The report concluded that an appropriately sized central processing facility would be feasible in the Palm Garage location. The next phase of development would be to complete a detailed study to define the appropriate program. (Refer to Figure 7 below):

Note: The purpose of this study was to address roadway configuration, ground transportation staging and future needs for additional parking spaces. However, BCAD did not proceed with this option.

Figure 7: Central Processor – Terminal 1 Landside



SOURCE: Central Processor Development Strategy (2011)
PREPARED BY: Leigh Fischer Associates

Fort Lauderdale-Hollywood International Airport, Signage and Wayfinding Master Plan (Summary)

Gresham Smith and Partners; January 2014

This report identifies and prioritizes issues related to airport wayfinding in order to recommend solutions as part of a comprehensive plan for the airport roadways, garages, curbfronts and terminals. The Signage and Wayfinding Master Plan included an electronic survey inventory of existing airport roadway, parking, curbfront and terminal signage, all of which was documented in a Geographic Information Systems (GIS) database. The circulation patterns for vehicular and pedestrian traffic were then analyzed in order to understand each airport visitor sequence.

The new airport signage standards were developed to address the needs identified through the analysis of existing site conditions, circulation, and the airport's functional and operational goals.

Note: Terminal Expansion (Concourses G and A) and modernization projects are adhering to the Signage Standards. The first phase of signage replacement is in the design development phase. It will address entry and exit road signage and parking garages.

ACCESS ROAD STUDIES

Perimeter Road Study, Technical Memorandum (Summary)

Leigh Fisher Associates; September 23, 2011

The expansion program for the south parallel runway, Runway 9R-27L/10R-28L, identified impacts to the south and west side of FLL. The encroachments included Perimeter Road. As such, the memorandum was prepared to review reconfiguration options and operational restrictions for the southwestern portion of Perimeter Road.

As per the memorandum, the south segment of Perimeter Road provides the primary internal route between the west side of the Airport, including the Economy Parking Lot, Federal Aviation Administration (FAA) airport traffic control tower (ATCT), and many general aviation (GA) facilities, and the east side of the airport, primarily comprised of the terminal complex. The south segment of Perimeter Road is also used as a backup in the event of closure of the north segment of Perimeter Road.

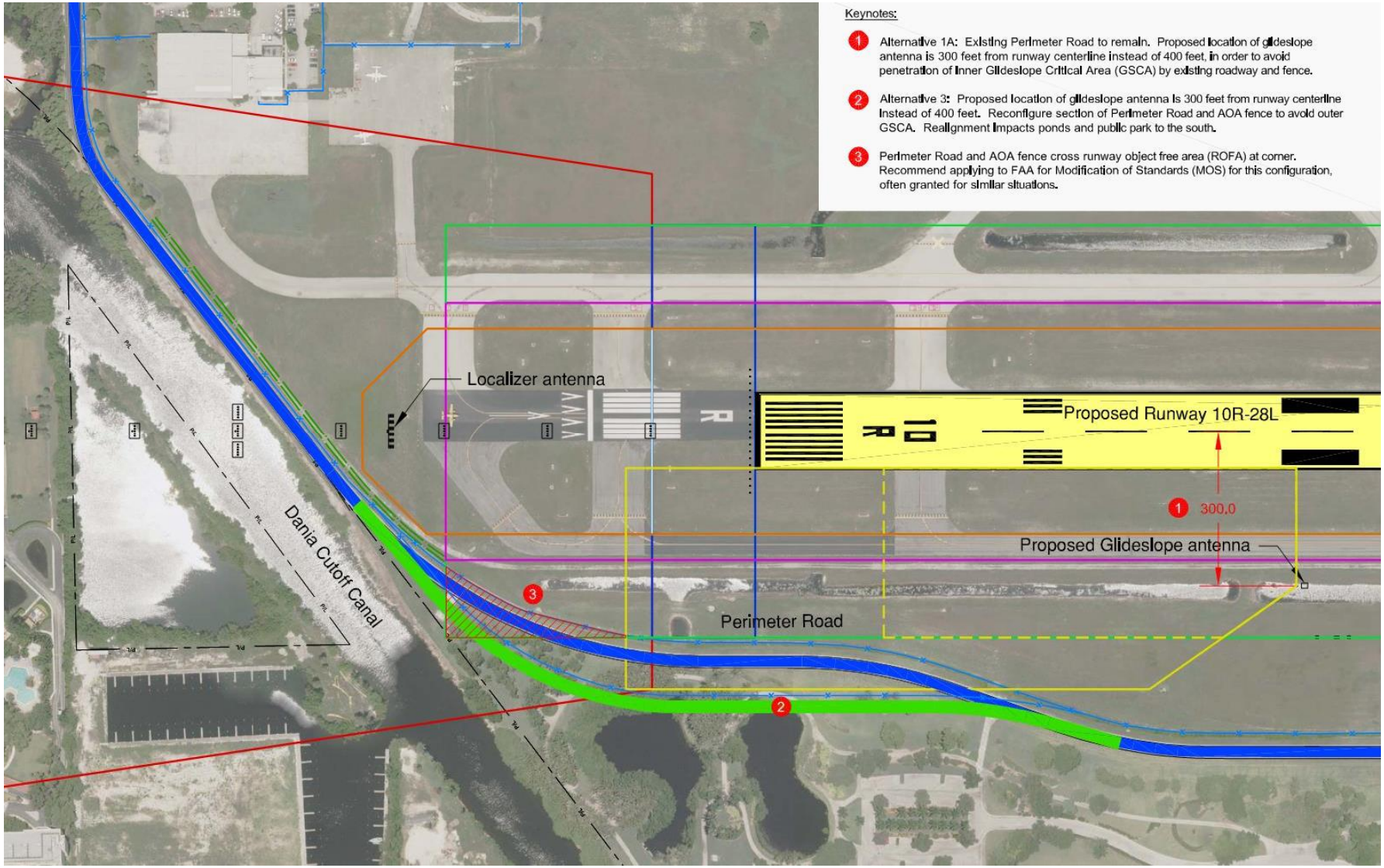
Six roadway reconfigurations alternatives were identified in the technical memorandum. It was determined that Alternative 1A, as summarized below in Figure 8, would be most preferable because it would require no reconfiguration of Perimeter Road or the Airport Operations Area (AOA) fence:

In Alternative 1A the existing roadway alignment is maintained, with the proposed location of glideslope antenna moved approximately 100 feet north. This shift allows the inner Glideslope Critical Area (GSCA) to avoid the existing roadway alignment; but requires a Modification of Standards (MOS) for the roadway to cross the corner of the Runway Object Free Area (ROFA).

The alternative is feasible if (a) the proposed location of the glideslope antenna could be changed from 400 feet from runway centerline to 300 feet from runway centerline, and (b) it is confirmed acceptable for the roadway and AOA fence to cross the GSCA (outer portion only).

Note: Southwest portion of Perimeter Road has been closed since 2015 and remains closed to public access.

Figure 8: Alternative 1A



SOURCE: Perimeter Road Study (2011)
PREPARED BY: Leigh Fischer Associates

Analysis of the Southbound Exit Roadway, Fort Lauderdale-Hollywood International Airport, Technical Memorandum (Summary)

Leigh Fisher Associates; July 8, 2012

This report provides the results of an analysis conducted to estimate the impacts on traffic conditions due to the closure of the existing two-lane southbound US 1 ramp from the terminal area. The plan proposed a new southbound exit adjoining the existing northbound exit ramp. This southbound roadway would curve to the east of the new runway, merge with Northeast 7th Avenue, and intersect with Northeast 10th Street at grade.

Under existing conditions, the roadway would experience Level of Service (LOS) C (stable flow) at 13.3 million enplaned passengers (MEP) and a LOS D (approaching unstable flow of traffic) at 17.3 MEP. With a 10% increase in traffic volume, under existing conditions, the road would experience LOS D at 17.3 MEP. The study concluded that if a replacement single-lane road was constructed, with a roadway capacity of 1,520 vehicles per hour, the road would operate at a Level of Service (LOS) D (approaching unstable flow of traffic) at 13.3 million enplaned passengers (MEP) and a LOS E (unstable flow of traffic) at 17.3 MEP. With a 10% increase in traffic volume and a roadway capacity of 1,360 vehicles per hour, the roadway was expected to operate at LOS E (unstable flow of traffic) by 13.3 MEP and LOS F (forced or breakdown flow of traffic) at 17.3 MEP. The Level of Service was noted to decrease with the proposed single lane option.

Using the study's results, the report recommended that the new southbound exit roadway operate as a two-lane roadway in the section between the split with the northbound exiting traffic and Northeast 10th Street based on the most conservative assumptions. These assumptions include an assumed rerouting of Perimeter Road traffic to use the new ramp. Additionally, the southbound exit is a major exit from the terminal, therefore, it was suggested that at least two lanes be provided to accommodate traffic demands and to avoid potential issues with blocking the exit. However, the South Service Road exit to Perimeter Road remains in place consistent with the less conservative assumptions with an estimated LOS D at 17.3 MEP.

Note: A single-lane Ramp G was constructed to replace the original two lane southbound ramp.

Perimeter Road Analysis, Fort Lauderdale-Hollywood International Airport, Technical Memorandum (Summary)

Leigh Fisher Associates; July 8, 2012

This report was generated to summarize the results of a study of the Level of Service (LOS) along Perimeter Road and the recommendations for the proposed Perimeter Road tunnel (single lane in each direction). The tunnel proposal was presented to address the runway expansion of Runway 9R-27L.

The analysis of Perimeter Road estimated the expected LOS for four planning activity levels (PALs) based on number of million enplaned passengers (MEP): Existing at 10.5 MEP, 13.3 MEP, 17.3 MEP, and 19.6 MEP. While the roadway operated at LOS C (stable flow) or better, under the most conservative assumptions, the roadway

was expected to degrade to LOS D (approaching unstable flow) by the near-term planning level of 13.3 MEP and to LOS E (unstable flow) by the 17.3 MEP PAL. Under the least conservative conditions, the roadway was expected to operate at LOS D at the mid-term and long-term PAL.

The existing northbound volumes on Perimeter Road were found to be almost 300 vehicles lower than the southbound volumes and it was noted the northbound Perimeter Road would continue to operate at LOS C or better through the 19.6 MEP PAL if it were reduced to one travel lane. The report stated that providing two lanes in the southbound direction significantly improved the roadway operations and was expected to result in LOS C at the 19.6 MEP PAL under the most conservative conditions.

The report recommended that the proposed tunnel over Perimeter Road provide sufficient width to accommodate two travel lanes in each direction to accommodate future growth, traffic volume, and development opportunities in the surrounding areas. For the short term, the report recommended re-striping to allow for two southbound lanes, as the southbound traffic was greater than the northbound traffic.

Note: Only two lanes have been provided for Perimeter Road inside the tunnel.

Roadway Planning Integration, Report (Summary)

Leigh Fisher Associates; November 30, 2012

This report documents the results of an evaluation to determine the preferred long-term southbound exit roadway alternative, as well as the evaluation of Maintenance of Traffic (MOT) alternatives presented as a part of the *Final Report, Maintenance of Traffic Review* solutions associated with FLL Package 303 – Runway and Taxiway Bridges on May 2012.

The long-term southbound exit alternatives were developed to meet the closure of the FLL exit to southbound US 1 as part of the runway extension project. The replacement included the construction of a road wrapping around the east end of the extended runway, joining southbound Northeast 7th Street, and turning onto the westbound Northeast 10th Street traffic. LOS at these intersections, specifically Northeast 10th Street/Griffin Road and US 1, would be severely affected. Five potential alternatives were identified to reduce the impact of traffic at these intersections. The alternatives were evaluated based on the most intuitive way-finding on the exit roadway, the travel distance needed to reach US 1, the area of construction, the constructability of the alternative, and the capability of delay reduction at the US 1/Griffin intersection. Based on the analysis of the alternatives, a ramp located to the north of the "donut" roadways was considered as a near term option due to its lesser impact on the intersection traffic. Additionally, a grade separation of Griffin Road/Northeast 10th Street and US 1 was also recommended for further consideration due to the anticipated development of a passenger rail service on the Florida East Coast (FEC) rail corridor causing further deterioration to LOS at the intersection of US 1 and Griffin Road/10th Street due to the increased use of the Griffin Road at-grade rail crossing.

This report also included alternative approaches for consideration. The first approach considered a detour path for traffic traveling northbound on US 1 to I-595 using the existing roadways. The primary concerns from this approach was the further degradation of LOS at the intersection of US 1 and Southeast 30th Street, which is already operating at LOS F during busy periods, and the additional mileage for traffic directed to Griffin Road. The approach considered five different alternatives. Based on the analysis of alternatives, the construction of a

slip ramp between the existing Northbound US 1 entry ramp and the Airport exit roadway was recommended for further consideration. Additionally the area of construction is limited to less than 10,000 square feet with no anticipated intersection impacts. This alternative had vertical and horizontal constructability constraints that would need to be addressed.

The second approach considered a detour path for traffic exiting the airport to southbound US 1. These alternatives allowed for the closure of the existing exit to southbound US 1 prior to the completion of the replacement ramp. Traffic headed to southbound US 1 would be directed north to Southeast 30th Street, where a turn would be needed for traffic to reach southbound US 1. The approach considered two different alternatives. One alternative routed the traffic directed to the southbound Airport exits to use Eller Drive to reach southbound US 1. The other alternative used Northeast 7th Avenue and Eller Drive to reach southbound US 1. Based on the analysis of these alternatives, the use of Northeast 7th Avenue and Eller Drive seemed to be the preferred alternative due to having a lesser impact at the Eller Drive intersection. However, after the completion of the Eller Drive grade-separation project, both alternatives are equally feasible due to the reduction of traffic volumes at this intersection.

Note: Ramp G was constructed as designed with a southbound US 1 connection through a diversion to Northeast 7th Avenue and Northeast 10th Street.

Perimeter Road Improvements, Technical Memorandum (Summary)

Reynolds Smith and Hills, Inc.; March 13, 2013

An upsurge in traffic was identified along Perimeter Road due to ongoing construction activities and shifts in the roadway circulation patterns. These changes also contributed to increased vehicular accidents along the road. A traffic study was conducted (and summarized in the above-referenced report) to develop plans for improving safety along Perimeter Road. Although outside of the study area of the Landside Analysis, this study was summarized as the information collected will be beneficial for the current Master Plan Update.

Bi-directional continuous mechanical traffic counts were collected at three locations along Perimeter Road:

1. Perimeter Road east of Southeast 2nd Avenue (Figure 9)
2. Perimeter Road east of Southwest 12th Avenue (Figure 10)
3. Perimeter Road west of Southwest 12th Avenue (Figure 10)

The average daily traffic along the areas of Perimeter Road surveyed, ranged from approximately 4,600 - 8,200 vehicles per day. Peak hour volumes ranged from approximately 330 - 760 vehicles per hour. Eight-hour manual turning movement counts were collected at the intersection of Perimeter Road and Southwest 12th Avenue. The results indicated that the northbound right turns and westbound left turns were the dominant movements at the intersection. Northbound right turns accounted for approximately 97% of the traffic on the northbound approach and 40% of the total traffic counted at the intersection. Westbound left turns were approximately 88% of the traffic on the westbound approach and 44% of the total traffic counted at the intersection. Trucks (including buses) accounted for approximately 13% of the total traffic using the intersection.

The report recommended that the proposed improvements be implemented at Location #1 (Perimeter Road near the I-595 overpass) and Location #2 (intersection of Perimeter Road and Southwest 12th Avenue); however, the report also noted that there were some utility conflicts that would need to be addressed prior to completion of these options. The improvements at Location #1 included widening the curve to create a painted buffer, which would increase the separation between opposing traffic and reduce collisions at the curve. The recommended improvements at Location #2 included widening the northbound approach to facilitate two additional lanes along this approach. Both locations are shown in the figures on the subsequent page.

Note: Project was implemented as recommended.

Figure 9: Location #1 - Perimeter Road, Near the I-595 Overpass

SOURCE: Google Earth (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 10: Location #2 - Intersection of Perimeter Road and SW 12th Avenue

SOURCE: Google Earth (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Exit Ramp Assessment Fort Lauderdale-Hollywood International Airport (Summary)

Kimley-Horn and Associates, Inc.; August 2014; study prepared for FDOT

The closure and temporary detour of the southbound exit ramp to US 1 and the proposed permanent changes in access from the airport to southbound US 1 have generated some concern within the communities located south of the airport. In this study, the Florida Department of Transportation (FDOT) was asked to review the decision making process used by BCAD to evaluate the elimination of direct access to southbound US 1 and to review other options available for southbound access to US 1. The purpose of this report is to summarize the results of an independent study based upon available information directly requested and received from FDOT and BCAD. Three alternative alignments for access to southbound US 1 were developed as part of this independent study. A summary of the alternatives and the primary issues affecting these alternatives are as follows:

1. Utilize the Perimeter Road alignment as an alternative route for connection to southbound US 1. This connection does not provide adequate weave distance for rental car and parking deck traffic to access Perimeter Road. There is no practical connection to US 1 south of the extended runway utilizing either Griffin Road or a newly constructed flyover.

2. Restoration of the direct connection to southbound US 1 with a short flyover connecting the airport exit over FEC Railway. This connection also does not provide adequate weave distance for rental car and parking deck traffic to access the exit to southbound US 1. A proper connection to southbound US 1 is not feasible prior to Griffin Road given the required clearance over the railroad and available clearance to the runway extension bridge structures.

3. Connection to southbound US 1 through an alternative loop and/or flyover combination located north of the existing airport exit. Similar to the second category, a proper connection to southbound US 1 is not feasible prior to Griffin Road given the required flyover clearance and available clearance to the runway extension bridge structures. Shifting of this alternative further north to provide adequate space for a southbound US 1 connection is not feasible due to required runway clearance requirements for the north runway.

The results of this detailed analysis indicate the current proposed Ramp G connection for southbound US 1 and diversion to Northeast 7th Avenue and Northeast 10th Street provides the best exit route for southbound US 1 traffic given the restrictions created by the new runway extension bridges, proximity of the FEC Railway and US 1 along with flight path encroachment restrictions.

Note: Ramp G was constructed as designed with a southbound US 1 connection through a diversion to Northeast 7th Avenue and Northeast 10th Street.

Environmental Evaluation of Ramp G to US 1, Technical Memorandum (Summary)

Landrum & Brown; October 20, 2014

This memorandum was generated to document the environmental effects of a proposed off-ramp (Ramp G), to be located in the approximate location of the off-ramp to Northeast 7th Avenue. The Ramp G project was proposed in the memorandum to have two dedicated left-turn lanes, one through lane and one right-turn lane to northbound US 1 from Northeast 10th Street.

According to the report, the surface transportation analysis developed for the 2008 Final Environmental Impact Statement (FEIS) determined the Level of Service (LOS) of the existing roadway system around the Airport fails under existing conditions. All traffic leaving the Airport is directed to northbound US 1. Once traffic has passed the US 1/I-595 intersection, vehicles may conduct a U-turn to travel south on US 1. Vehicles must travel approximately 3.2 miles from Terminal Drive to reach the Griffin Road/US 1 intersection. The number of vehicles on roadways near the Airport is expected to be the same with or without Ramp G. The proposed Ramp G redirects traffic for southbound US 1 to Northeast 7th Avenue and Northeast 10th Street/Taylor Road reducing the distance to approximately 1.4 miles to reach the same intersection (a difference of 1.8 miles).

Note: Ramp G was implemented as designed with a southbound US 1 connection through a diversion to Northeast 7th Avenue and Northeast 10th Street.

US 1 – Griffin Road Intersection Study (Summary)

Kimley-Horn and Associates, Inc.; December 2015; study prepared for FDOT

The expansion of the southern runway at FLL modified the roadway access connections between the airport and adjacent roadways. The direct connect ramp from the Airport to southbound US 1 was eliminated in favor of an at-grade access connection around the eastern end of the extended runway. This new connection opened in January 2015. FDOT and BCAD commissioned a study of the operational and safety characteristics for three intersections and a portion of Terminal Drive impacted by the newly completed ramp connection from Terminal Drive to US 1 southbound at Griffin Road (SR 818) and Taylor Road. The study focuses specifically on the intersections of US 1 at Griffin Road/Northeast 10th Street, US 1 at Old Griffin Road, and Griffin Road (SR 818) at Perimeter Road. The project location is shown in Figure 11. The purpose of this study was to evaluate the operational and safety characteristics for each connection and conduct engineering analyses to develop and analyze conceptual design alternatives that will provide current, short-term, or mid-term improvements primarily within available right-of-way. Proposed improvements for the study intersection are as follows:

- The westbound approach modifications call for widening from a five-lane undivided section to a seven-lane divided section. The proposed seven-lane undivided section has six westbound lanes (one right-turn lane, two through lanes, and three left-turn lanes) and one eastbound through lane.
- Pedestrian access was reviewed and discussed with the various stakeholders. In order to connect the sidewalk along Griffin Road to the sidewalk on Perimeter Road, a pedestrian crosswalk would be required and would need to be approved. Additionally, a pedestrian railroad crossing would need to be constructed if a sidewalk was proposed on the north side of Griffin Road.

Figure 11: Study Area

SOURCE: FDOT District 4 Exit Ramp Assessment, August 2014
PREPARED BY: Kimley Horn & Associates, Inc.

Note: This study is completed.

PARKING STUDIES

Fort Lauderdale-Hollywood International Airport – ADA/Accessibility Review of Existing Parking Systems (Summary)

Pamela Pflueger & Associates, Inc.; 1996

This report presents the findings of an evaluation of the Parking System at FLL with respect to compliance of the Americans with Disabilities Act (ADA), Florida Accessibility Code for Building Construction (FACBC), and overall accessibility services for the BCAD. The areas addressed during the evaluation process included: The Parking Garage, Daily, Economy North, Economy South and Park 'N Save Lots, Parking Lot Shuttles, and the Connecting Roadway Signage. The report was marked as “Protected by Attorney/Client Privilege”.

Note: FAA ADA inspections were performed in 2016.

Facility Condition Assessment Report for Hibiscus Garage and Cypress Garage/Rental Car Center (RCC) Final Report (Summary)

Reynolds Smith and Hills, Inc.; Revised November 19, 2012

This report forecasted recommended maintenance and repair capital expenditures for the Hibiscus, Cypress, and Rental Car Center Garage facilities over a five year period.

Only significant or primary visible defects, worthy of repair inside five years, are noted in this document. Throughout the report, complete documentation and location of all physical defects are not included.

Recommendations related to the Landside Analysis include:

- Cypress Garage will add an expansion joint cover on Level 3
- Overall repair of visible defects of garage

Long-Term Terminal-Area Parking Needs Study, Fort Lauderdale-Hollywood International Airport (Summary)

Leigh Fisher Associates; March 29, 2013

The purpose of the study included:

- An assessment of the estimated future public parking demand for terminal-area parking,
- Determining what portion of the terminal-area parking demand can be accommodated within the terminal area with existing facilities, and
- Identifying the maximum size of a parking facility that can be developed at Palm Garage, determining if (with a new parking facility) all of the future requirements can be accommodated within the terminal area, and estimating the parking facility cost.

The study concluded that up to 8,250 spaces can be developed on the Palm Garage site and meet requirements through 2025. The planning/design for a new garage should begin in 2013/2014 to allow a potential 2017 opening date (assumes 3 years of planning, design, and construction). The new garage will increase the number of spaces within the acceptable walking distance of Terminals 2, 3, and 4 which should last through 2032. However, the new garage could approach capacity as early as 2019 with a "high" growth scenario and; the study stated that planning for subsequent parking expansion would need to start as early as 2016.

Note: The Master Plan Update will reassess the long-term parking needs.

Rental Car Center Operations and Capacity Study, Fort Lauderdale-Hollywood International Airport (Summary)

Leigh Fisher Associates; January 2015

This report assesses the efficiencies and capacity of the Rental Car Center (RCC) at FLL.

The RCC is very efficient compared to facilities at peer Airports – the rental car industry benefits from the short travel-distance between the Quick Turnaround Area (QTA) and ready/return areas. The findings of the study detailed the RCC current operations are satisfactory with minor exceptions:

- There are insufficient storage spaces and the available Level 5 space is considered too costly; consider revising lease
- Minor improvements are needed to shuttle ramps (re-grooving), pedestrian refuge areas (expansion), QTA lighting, small operators' counters (expansion), and security queues at Terminal 1
- Stricter enforcement of rules prohibiting use of Level 1 for long-term storage is recommended
- Consider leasing the lots south of the RCC, which are currently used for construction staging, to the RAC companies for off-site storage
- Install card-activated fuel pumps

In 2025, the RCC can accommodate mid-term requirements without major structural modifications if the following occurs:

- Co-locate the customer service areas of the three brands of each of the three major companies (i.e., move Dollar/Thrifty to Level 3 and Avis to Level 4)
- Allocate four bays on Level 5 for the ready/return areas of the small operators (e.g., EZ Rent-a-Car, Royal, Advantage, and/or new entrants)
- Lease storage spaces on the remainder of Level 5 and on Level 6 as needed

In 2035, the RCC can accommodate long-term requirements with several modifications:

- Construct a QTA expansion immediately adjacent/east of the RCC
- Relocate the ready/return spaces of one brand of each major company to Level 5
- Lease storage spaces on the remainder of Level 5, and Levels 6 and Level 7, as needed

Note: The Master Plan Update will reassess the RCC long-term requirements.

GROUND TRANSPORTATION STUDIES

Operating Guidelines for Commercial Ground Transportation at Fort Lauderdale-Hollywood International Airport * (Summary)

Broward County Florida; March 1, 2014

**This report is currently under revision.*

This report provides guidelines for adequate and efficient regulated commercial vehicle ground transportation services at FLL.

Taxi

Policies for Taxicabs related to this study are:

- Vehicle repairs are prohibited in the Commercial Vehicle Holding Lot or Terminal curbfronts.
- No taxicab shall stop, stand, or park on Perimeter Road at the entrance to the Commercial Vehicle Holding Lot.
- When the Commercial Vehicle Holding Lot is full, overflow taxicabs must depart the area and return when the Lot re-opens.
- Passengers may only be loaded in designated taxicab dispatch areas designated on the Lower Level Terminal Curbs or Ground Transportation Areas (GTA). Passenger loading outside of designated taxicab loading areas or on the Upper Level is strictly prohibited.

Commercial Vehicles

Policies for Courtesy Vehicles related to this study are:

- Pick-up on Lower Level in/at designated GTAs or Terminal curbs only.
- Drop-offs are permitted on the Upper Level only. Any deviations to this policy must be approved by BCAD.

Charter Bus

Policies for Charter Bus Operations related to this study are:

- Bus must be parked parallel to the curb, no angle parking.
- Bus may only access the Terminal GTA curb when all passengers are ready for immediate loading.
- Passengers must remain on the curb until the bus is ready for loading.
- Passengers shall retrieve their baggage only from the curbfront of the bus. Drivers are prohibited from allowing passengers to retrieve baggage from the roadway side of the bus.

Prearranged Limo

Policies for Prearranged Limousines, Sedans, and Vans related to this study are:

- Parking in the designated areas on Level 1 of the FLL Parking Garages, meeting and collecting passengers at the designated prearranged meeting areas located in the baggage claim areas of the Terminals.
- Drivers waiting for their passengers in the dedicated waiting areas may hold one 12” x 12” sign stating the name of the passenger and the transportation company.
- If passengers are not available, the vehicle must depart Terminal curb immediately.
- Passengers shall load using curbfront doors only.
- Drivers must comply with directions of the Curbfront Coordinator.

Off-Airport Rental Car

Policies for Off-Airport Rental Car related to this study are:

- Prohibited from picking-up or dropping-off in/at the Terminal curbs or GTAs; must use the Consolidated Rental Car Facility Bus Stop #7 designated for off-airport rental car shuttle buses.
- Rental car transactions are prohibited at the FLL Terminal curbs or Parking Garages.
- Vehicles servicing both off-airport rental car and off-airport parking must use the Consolidated Rental Car Facility Bus Stop designated for off-airport rental car shuttles.

Commercial Vehicles

Policies for All Commercial Vehicles related to this study are:

- No driver shall stop, stand, or park a vehicle in an officially designated and appropriately signed restricted use zone or GTA. A “restricted use zone” is defined as an area where parking, standing, or stopping is reserved for an authorized vehicle.

Ground Transportation Areas

Locations of the Ground Transportation Areas are:

- Ground Transportation Area 0 (GTA-0): This area follows the Lower level of the terminals east of Terminal 1.
- Ground Transportation Area 1 (GTA-1): This area is located in the Lower and Upper level between Terminal 1 and Terminal 2.
- Ground Transportation Area 2 (GTA-2): This area is located in the Lower and Upper level between Terminal 2 and Terminal 3.
- Ground Transportation Area 3 (GTA-3): This area is located in the Lower and Upper level between Terminal 3 and Terminal 4.

Delivery

Deliveries are accommodated at the following locations and times:

- 6:00 AM-9:00 AM GTA 1 Upper/Lower level. Vehicle must be attended at all times.
- 6:00 AM-9:00 AM Gate 100 and Garages.
- 24/7 GTA 4 upper level. Vehicle must be attended at all times.
- All vehicles are subject to security inspection.

Commercial Ground Transportation Holding Lot

Currently, FLL permitted taxicabs, GO Airport Shuttle (FLL Airport concessionaire) on-demand shared ride limousines, sedans, vans, and FLL permitted prearranged charter buses with a seating capacity of over 20 passengers are authorized to utilize the Commercial Vehicle Holding Lot ("the Holding Lot") located on the northwest side of the Airport off of Perimeter Road near the Gate 300 entrance.

Note: The curbfront operations are frequently modified. Ongoing coordination with BCAD Ground Transportation staff will occur during the duration of this project to maintain communication on the latest curbfront operations.

SEAPORT/CRUISE STUDIES

Broward County Intermodal Center and People Mover System, Fort Lauderdale-Hollywood International Airport and Port Everglades, Preliminary Engineering Report Draft (Summary)

Lea+Elliot; June 2009

This document detailed Broward County's 2020 Vision Plan for future development at FLL and Port Everglades, focused on the Intermodal Center (IMC) and People Mover.

The People Mover consisted of an approximately five-mile long proposed premium transit route (coordinated bus service or automated people mover) with station stops at the FLL terminals, the Broward County IMC, and the Midport and Northport Port Everglades cruise terminals.

The IMC consists of a transit transfer station providing a connection between the People Mover and proposed elements of the regional transportation network such as Central Broward East/West Transit Analysis, South Florida East Coast Rail Corridor Transit Analysis, and Broward County Transit's planned bus route improvements.

The Feasibility Study found that the Project was technically viable and recommended the County should attempt to secure Federal/State funding to offset the costs. Average traffic volumes on the airport roadways would be reduced by 33% relative to the no build options and volumes on Eisenhower Boulevard within the Seaport would be 5% lower. Under Bus Option 5A, average traffic volumes would be reduced by 4% on Eisenhower Boulevard within the Seaport relative to the No Build Option and there would be no difference on the Airport Roadways.

After further evaluations and rankings, a few recommended alternatives were identified for long-term build-out alternatives:

- People Mover Alternative 6A: Develop an Automated People Mover within the Alternative 6A corridor between FLL and Port Everglades
- IMC Alternative 1: Develop a County Intermodal Center within the US 1/Airport Interchange
- Project Phasing Option: An interim measure of initially constructing portions of the system as lower cost elevated Busway which could later be converted to Automated People Mover (APM) system technology. This phased approach may involve implementing portions of Elevated Bus Alternative 5B which was the second highest ranked option and follows the same corridor as APM Alternative 6A. The conversion from

bus to APM would be facilitated by constructing the supporting elevated guideway for the Busway with the dimensions and structural capacity required to accommodate the operation of APM system technology in the future.

Note: Project was not implemented due to high costs and a required land purchase.

Near-Term Cruise Ship Passenger Processing Facility Programming Study (Summary)

Leigh Fisher Associates; March 2012

The focus of this study was to evaluate near-term cruise passenger alternatives to ease congestion at the curbfront and ticket lobby. Specifically the study evaluates on-airport solutions, independent of operational improvements, to reduce congestion on Terminal Drive. The study recommends:

- creating space for holding cruise passengers including amenities and food and beverage options
- Drop off points for baggage – transportation to screening facilities - distribution

Note: This project was not implemented.

Near-Term Cruise Ship Passenger Processing Facility – Cypress Alternative Study (Summary)

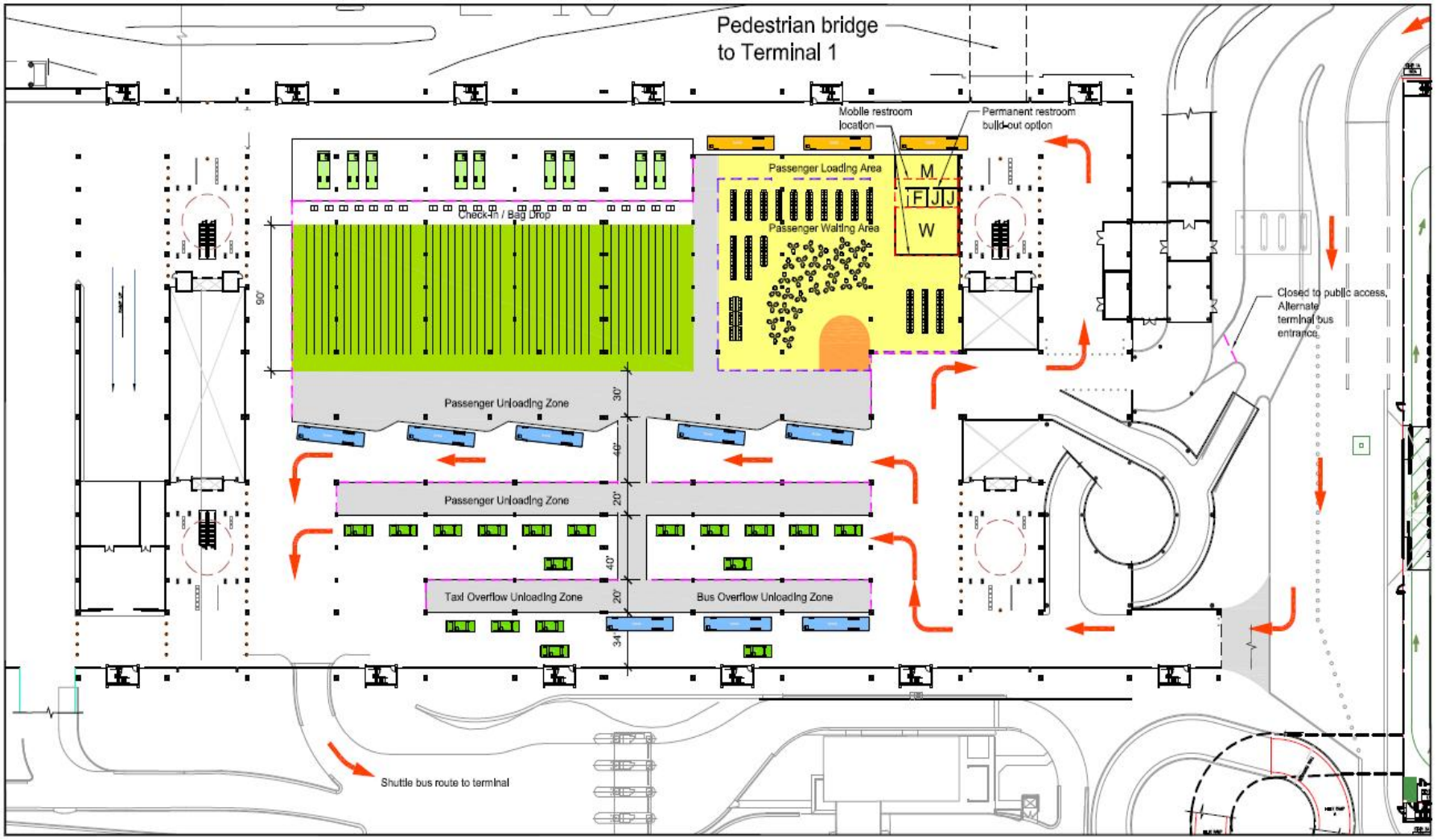
Leigh Fisher Associates; September 13, 2012

The goal of the study was to develop an on-airport solution to reduce congestion on Terminal Drive, relieve passenger congestion, increase revenue generating opportunities for FLL, improve overall passenger experience and airport image, minimize capital costs, with easy implementation, and re-use existing infrastructure in a more efficient and effective manner. Key assumptions to the analysis included:

- Peak cruise activity occurs on weekends from 9:00 AM to 12:00 PM, with 10:30 AM to 11:00 AM being the highest peak
- Approximately 140 – 160 bus trips occur during the peak three hours, with 50 during the peak hour with a dwell time of 10 minutes
- 32% of cruise passengers arrive by bus, 38% arrive by taxi/limo, and the remaining arrive by other modes
- 75% of passengers arrive from Port Everglades and 25% arrive from *PortMiami*

It was assumed the preferred alternative resulting from this study would achieve some reduction to peak activity, but would not solve the long-term issue. Four alternatives were developed within the Hibiscus garage including one option in the Cypress garage. The study recommended creating a space for holding cruise passengers, including amenities and food & beverage options and; waiting areas, drop off points for baggage, transportation to screening facilities, and distribution. A short-term solution was selected as well as a long-term solution if the temporary short-term solution proved effective. The short-term solution is presented in Figure 12 below.

Figure 12: Re- *Utilization* of Hibiscus Garage – Ground Level



SOURCE: Near-Term Cruise Ship Passenger Processing Facility Programming Study (2012)
PREPARED BY: Leigh Fisher Associates

Applicable Information

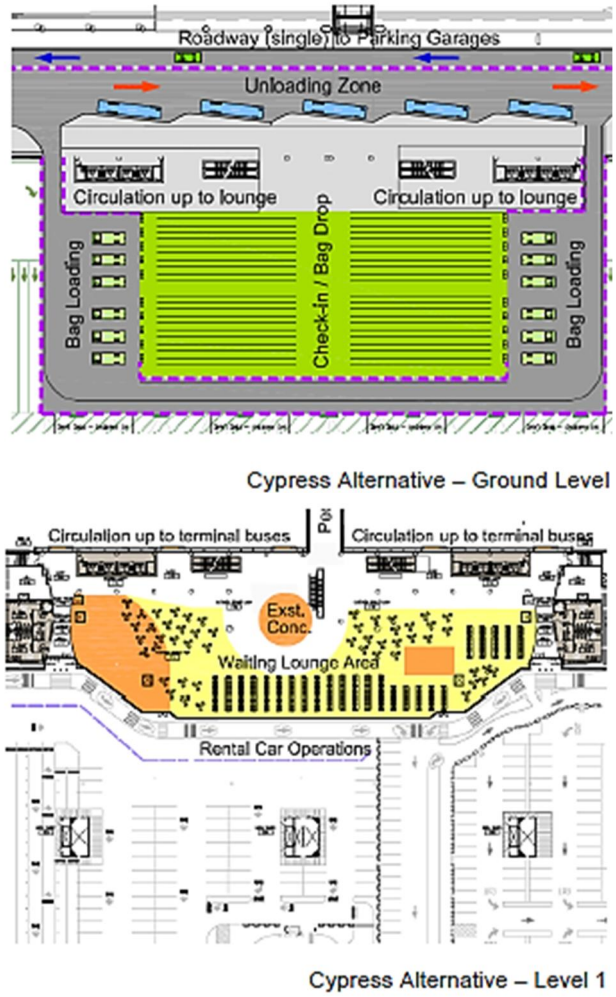
The assumptions used in the analysis include:

- Peak level of cruise ship processing activity occurs during a three-hour period on Saturday and Sunday from 9:00 am to 12:00 pm, with the highest peak between 10:30 am and 11:00 am
- 32% of cruise ship passengers arrive by bus, 38% arrive by taxi/limo, and the remaining arrive by other transportation; the focus of the study was on the buses and taxi/limo
- 75% of bus passengers arrive from Port Everglades and 25% of bus passengers arrive from Port of Miami
- There are approximately 140-160 bus trips in the peak three hours, with 50 during the peak hour
- A total of 50 seats per bus, but a maximum of 45 passengers per bus in the peak hour

Study Recommendations

Based on the analysis completed and input from various BCAD stakeholders, the preferred alternative of this report between the Cypress Alternative and the Hibiscus Alternative is the Cypress Alternative illustrated in Figure 16. The concept for this alternative included all operations associated with cruise ship processing, including check-in, baggage processing and waiting area in the underutilized Rental Car lobby area. This alternative is a more expensive alternative ($20M) than the Hibiscus Alterative, but is a better solution from the time of implementation until a permanent solution can be implemented in the central terminal area.

Figure 13: Cruise Ship Passenger Processing Facility, Cypress Alternative



SOURCE: Near-Term Cruise Ship Passenger Processing Facility – Cypress Alternative Study (2012)
PREPARED BY: Leigh Fisher

Note: This project was not implemented.

Cruise Operations and Ground Transportation Handbook, 2014-2015 Season* (Summary)

Broward County Florida; 2014-2015

**This report is currently under revision*.

BCAD developed the Cruise Operations Handbook as guidelines for drop off/pick up of cruise passengers and baggage at the Airport. The report guidelines designate bus parking to be curbfront in a single file line with enough space between each bus to maneuver in and out of the location easily. Double parking is prohibited. After being dropped off curbfront, the passengers will then make their way into their desired terminal and begin the check-in process.

The guidelines prohibit buses from staging at the Terminals, GTAs, or Airport roadways. Buses staging prior to the assembly of the passenger loads must stay in the Commercial Ground Transportation Holding Lot located at the Northwest quadrant of the airport accessed from Perimeter Road.

Active Loading

Active Loading is defined as all passengers and baggage in place at the curbfront, being loaded into a vehicle.

- GTA-0 (Lower Level): Active loading of a maximum of two buses or four vans or any combination of buses and vans not to exceed the allocated space.
- GTA-1 (Lower Level): Active loading of up to six buses at the outer curb, just west of the Hotel and Off Airport Parking Shuttle Loading Area. Active loading inside the GTA used for a maximum of four buses.
- GTA-2 (Lower Level): Active loading curbfront used for a maximum of three buses or four vans or any combination of buses and vans not to exceed the allocated space. Assigned space for Tri-Rail buses must not be used for cruise passenger loading.
- GTA-3 (Lower Level): Active loading curbfront used for a maximum of two buses or three vans or any combination of buses and vans that will not exceed the allocated space at any one time. The beginning of the GTA-3 outer curb is reserved for Tri-Rail stops.
- Valet Parking customer service kiosks will be located at GTA-1 and GTA-3 on the upper level.

Note: The curbfront operations are frequently modified. Ongoing coordination with BCAD Ground Transportation staff will occur during the duration of this project and continued coordination with BCAD Ground Transportation will occur throughout this Landside Analysis Study.

REGIONAL STUDIES

Commitment 2040, Long Range Transportation Plan for Broward County (Summary)

Broward County Metropolitan Planning Organization; Adopted December 11, 2014

The plan focuses on the long-term transportation improvements for Broward County through the year 2040. This document was prepared by the Broward Metropolitan Planning Organization (MPO) and covers all forms of transportation within Broward County.

FLL falls under the category of "Facilities extending beyond the MPO Planning Area" because it is considered a direct recipient of Federal funds or loans and has independent authority and/or ownership interest to develop financially constrained plans including operation and maintenance. The airport is considered a self-funded enterprise of Broward County government that maintains a master plan which directs its investment strategies and lists affordable projects.

The Florida Department of Transportation (FDOT) is responsible for developing the unfunded needs plan for the Strategic Intermodal System (SIS). Several major unfunded projects were identified by FDOT, some of which included improvements at Fort Lauderdale Hollywood International Airport (FLL). At the time of finalization of the Long Range Transportation Plan (LRTP), almost $1.0 billion dollars in unfunded, but needed, projects were identified in the SIS Unfunded Needs list for FLL. Some of these included runway and apron improvements and a new permanent baggage handling system for terminals 2, 3 and 4. Additional needs were also identified in the FLL Master Plan.

Broward County Transportation Improvement Program, FY 2014/2015 – FY 2018/2019 (Summary)

Broward County; Adopted December 11, 2015

Twelve transportation improvement programs were identified on the regional off-airport area involving projects relating to maintenance, lighting, rail preservation, bridge rehabilitation, sidewalks and bike lanes implementation, interchange improvement, and urban corridor improvements. The cities with projects in the vicinity of FLL are identified below:

City of Hollywood:

Eight transportation improvement programs were identified within the City of Hollywood relating to lighting, sidewalks/bike lanes implementation, addition of turn lanes, and for Project Development & Environmental (PD&E)/Environmental Management Office (EMO) studies. The identified projects are off-airport and they do not impact the traffic flow at FLL.

City of Dania Beach:

Eight transportation improvement programs were identified within the City of Dania Beach. Of the eight, five were identified in the regional off-airport area involving projects relating to bridge replacements, bridge rehabilitation, traffic lane reconstruction, and sidewalks/bike lanes implementation. The three projects that were identified within the airport area are related to environmental mitigation, interchange improvement, and sidewalk/bike lane implementation. The interchange improvements are going to be implemented right along I-95 and the I-595 exchange, just to the northeast of the airport area. These improvements will have a direct impact on the traffic

flow in FLL. There will are proposed bike and sidewalk improvements that will extend from S Dixie Highway to Griffin Road, along the south side of the canal, just south FLL. This sidewalk and bike lane implantation could potentially have some impact on the traffic on the south end of the airport.

City of Fort Lauderdale:

Thirty-six transportation improvement programs were identified within the City of Fort Lauderdale. Of the thirty-six, thirty-three were identified in the regional off-airport area, involving projects related to parking, facility construction, rail preservation, transit improvements, communication improvements, urban corridor improvements, bridge rehabilitation, resurfacing, bike path and sidewalk implementations. The three projects that were identified within the airport area are related to environmental mitigation, interchange improvement, and sidewalk/bike implementation. The environmental mitigation and interchange improvement projects are the same projects mentioned above within the City of Dania Beach. The bike and sidewalk implementation plan is set to run along the east side of Perimeter Road from I-595 to Griffin Road. These projects will have a direct impact on the traffic flow in FLL.

SUPPLEMENTARY DOCUMENTS

Automated Vehicle Identification (AVI) Data

The Broward County Aviation Department (BCAD) collected Automated Vehicle Identification (AVI) data for the vehicular movement in the Taxi Hold Lot Entrance/Exit, during the period of May 2015 to December 2015. This data tabulated the number of taxis moving in and out of the lot during each month. Based on the data collected, there were an average of 109,065 documented taxi cab entries and exits into this lot.

FDOT Studies (Summary)

The State Transportation Improvement Program (STIP) is a federally mandated document that must include a listing of projects planned with federal participation in the next four fiscal years. The report is based upon the same projects that are listed in the first four years of FDOT's Adopted Five Year Work Program. The projects listed that are located in the regional off-Airport area and that have not been mentioned in the previous sections include the following:

- Addition of lanes at I-95 interchange from south of Sheridan Street to north of Griffin Road
- Arterial traffic management on I-95 from Broward/Miami-Dade Countyline to Palm Beach Countyline
- I-95 Broward County's corridor interchange master plan (PD&E)
- PD&E on Griffin Road and US-1 intersection
- Addition of lanes and reconstruction of SW 30th Avenue from Griffin Road to SW 45th Street

Parking Facilities Layout Drawings

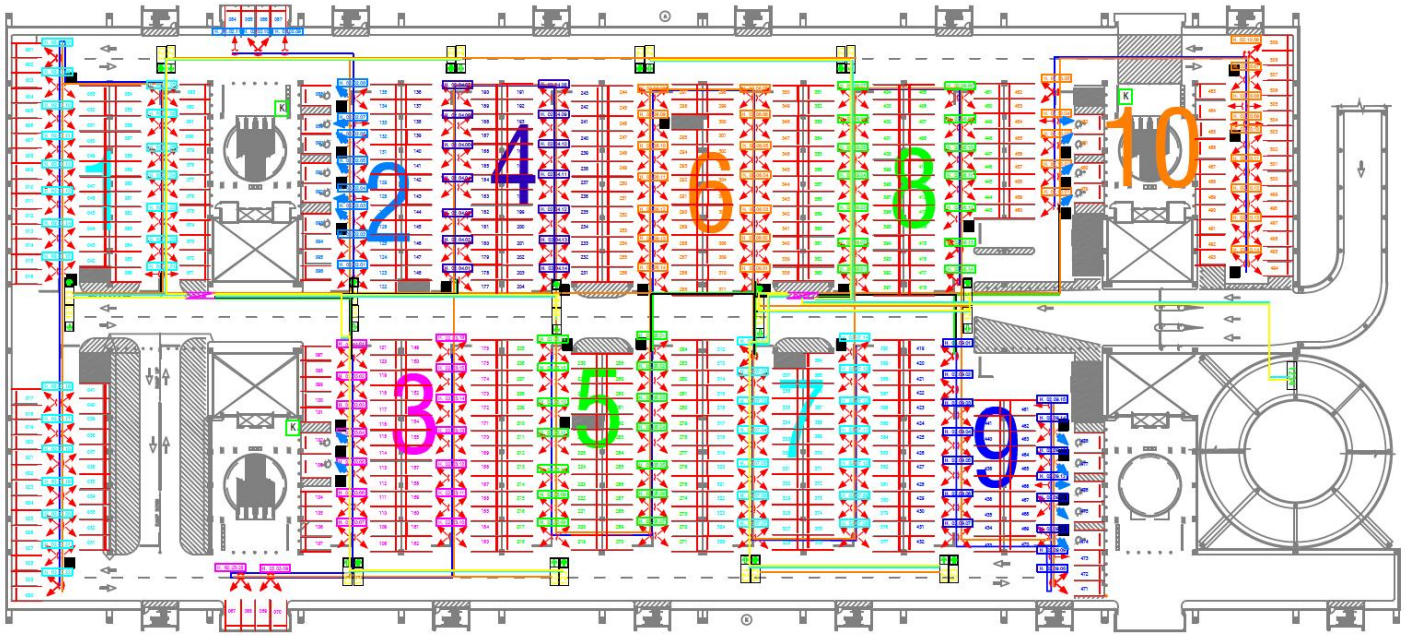
Layout drawings of each on-site parking facility was provided by BCAD. Schematics of each parking level for each garage were provided and detail the following information:

- Power Cabinets
- Conduits
- Communications Network

- Signage location (i.e. aisle signs, entrance signs, etc.)
- Parking Locator Kiosk location
- Camera locations

An example of the parking layout for the Hibiscus Garage on Level 2 is provided in the figure below.

Figure 14: Parking Layout Hibiscus Level 2



2.2 TERMINAL ACCESS ROADWAY INVENTORY

Landside facilities include the non-secure access, circulation and parking areas in and around the airport site. The following sections detail the regional and terminal area access roadway network, the terminal curbfront, the rental car facilities, and the parking facilities.

Access to FLL is provided by a ground transportation system that includes regional highways and interstates, major arterial roadways, and signalized intersections. The airport access roadway system serves as the landside interface between the regional roadway system and the terminal curbfront facilities. The terminal access roadways are categorized as one of three terminal access roadway types: Airport Access Roadway, Terminal Area Roadway, or Curbfront. Each roadway type has different characteristics and different methodologies for calculating LOS. The LOS criteria and methodology will be documented in the future Demand/Capacity Technical Memorandum. Figure 15 illustrates the FLL terminal access roadways by the designated roadway category.

The regional roadways include the freeways, highways, and arterial roadways that provide access to the airport carrying airport-related traffic, but are primarily used for non-airport trips. Traffic volumes on these roadways are high, as they serve a densely developed urban area and carry a large number of trips. Historically, traffic peaks in the late afternoon when commuter traffic overlaps with the evening peak periods of the airport-related traffic. As shown in Figure 15, the public airport access roadways provide landside access to the terminals, public and employee parking lots, rental car facilities, commercial vehicle holding areas, and airport support/ancillary facilities. A summary of the airport access roadways' characteristics is provided below.

REGIONAL ROADWAYS

There are two main regional roadways feeding the departure and arrivals level of each terminal complex: US 1 and Interstate 595 (I-595). Interstate 95 (I-95) also connects to I-595 along the east side of FLL.

U.S. Route 1

US 1 is a six-lane divided arterial that runs in a north-south orientation along the eastern edge of the airport. US 1 provides two access points to FLL: an entrance ramp 500 feet north of Griffin Road and another ¼ mile south of its I-595 interchange.

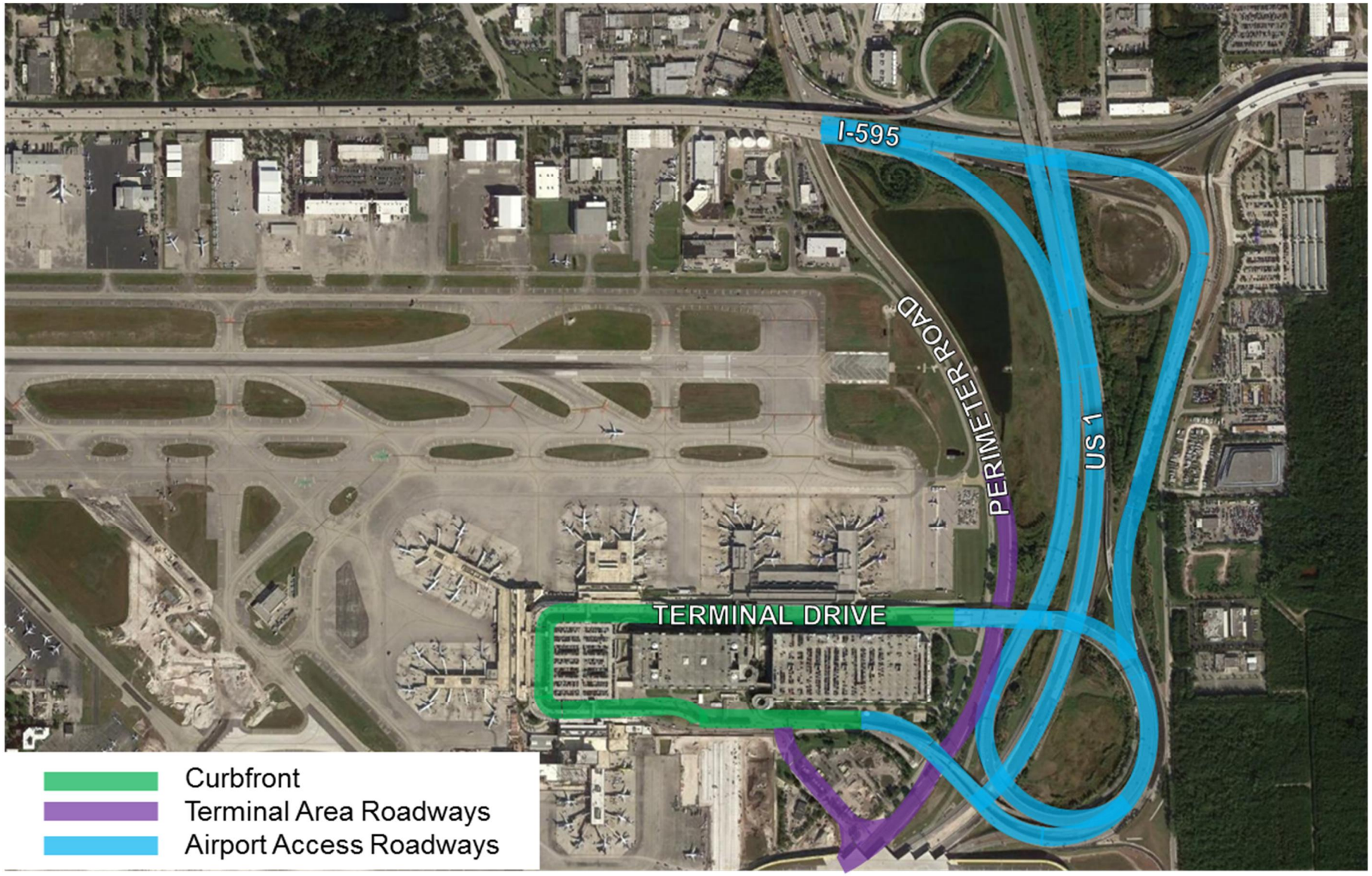
Interstate 595

I-595 is an eight-lane divided interstate located north of the airport. The US 1 interchange at the eastern edge of the airport is the final interchange, providing access to FLL and Port Everglades. The eastern terminus consists of two lanes for US 1 southbound, two lanes for US 1 northbound, and two lanes for Port Everglades via Eller Drive.

Interstate 95

I-95 is a ten lane divided interstate that runs from north to south along the east side of the airport. There is a two-lane access ramp from I-95 to I-595 that provides connectivity to FLL. The interstate is currently undergoing improvements as part of ongoing express lanes project. The purpose of the I-95 Express Lanes Project is to improve mobility, relieve congestion, provide additional travel options, enhance transit services, accommodate future growth and development in the region, enhance emergency evacuation, and improve system connectivity between key limited access facilities in South Florida. "95 Express" is part of a regional network of express lanes

Figure 15: Terminal Access Roadways



SOURCE: Google Earth (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

that will provide a safe, efficient, and reliable transportation alternative to drivers traveling throughout South Florida.

Ongoing FDOT I-95 Express Lanes Phase 2 Project

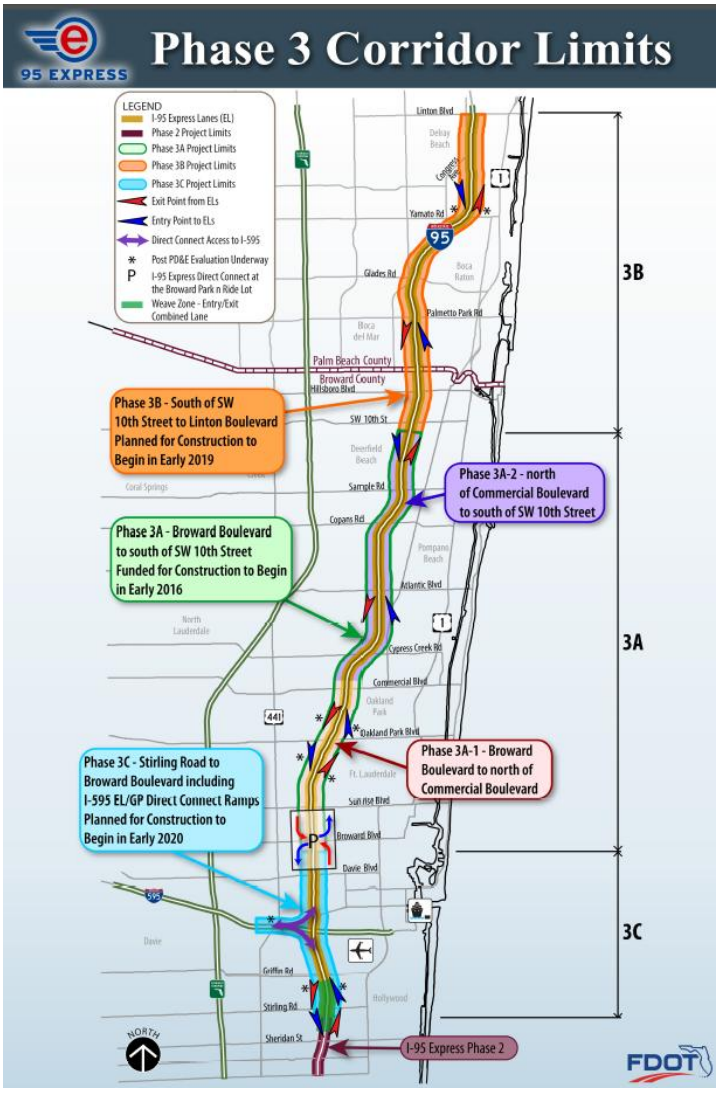
Construction of Phase 2 of I-95 Express Lanes began in November 2001, and is set to continue until spring 2016. Phase 2 will extend the existing express lanes north from the Golden Glades Interchange, in Miami-Dade County, to Broward Boulevard, in Broward County, by converting the existing High Occupancy Vehicle (HOV) lanes into two express lanes in each direction. Other project activities include:

- Road widening along 1-95 is ongoing at various locations throughout the project limits
- Installation of tolling and Intelligent Transportation System (ITS) equipment is on-going throughout the project limits
- Overhead sign installation is ongoing along I-95 in Miami-Dade and Broward counties
- Installation of new toll gantries in Miami-Dade and Broward County

FDOT I-95 Express Phase 3 Project

Currently, Phase 3A, the first segment of a phased construction plan for the full Phase 3 limits, is underway. Phase 3C, between Stirling Road (SR 848) to Broward Boulevard (SR 818), including the I-595 Express Lanes and General Purpose (non-tolled) direct connect ramps, is planned for construction to begin in early 2020. Phase 3C is a key component of Phase 3, providing a potential direct connection between northbound and southbound I-95 and I-595, to and from the west. The limits for the Phase 3 Corridor of the Express Lanes is shown in the adjacent figure.

Figure 16: Phase 3 Express Lanes Project Limits



SOURCE: FDOT I-95 Express Phase 3 Corridor Limits Map - http://www.95express.com
PREPARED BY: Kimley-Horn and Associates, Inc.

AIRPORT ROADWAYS

FLL has a two-level curbfront roadway providing access to ticketing/check-in (departing passengers) on the upper level and baggage claim (arriving passengers) on the lower level. Access to the terminal curbfronts are provided by Terminal Drive and Perimeter Road.

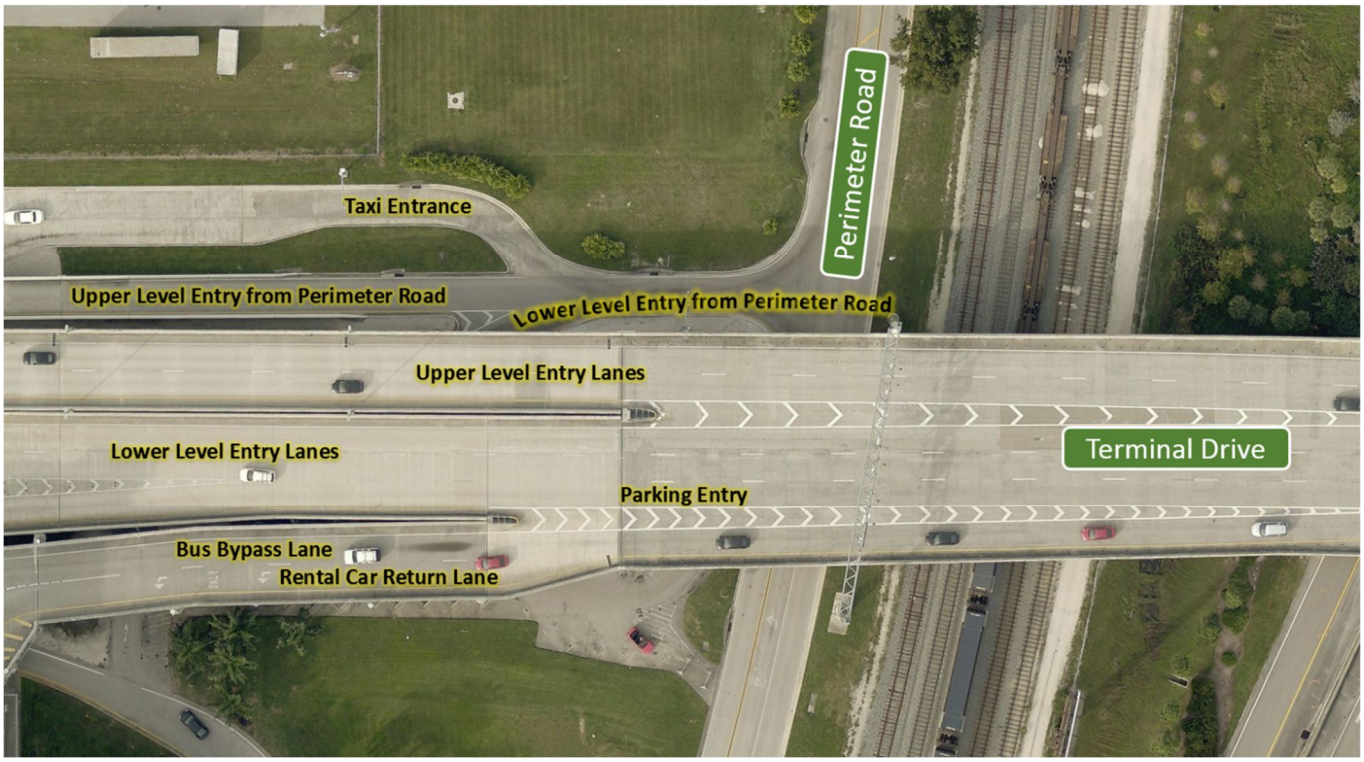
Terminal Drive

Terminal Drive is a two to six lane circulator road connecting I-595 and US 1 to FLL. The posted speed limit of Terminal Drive is 35 mph, reducing to 15 mph at Terminal 1. Terminal Drive is six lanes prior to entering FLL. The inside (leftmost) lane splits and becomes the Bus Bypass and the Rental Care Center (RCC) return lane. The two outside (right) lanes split and become the Departure Drop-Off lanes (Upper Level) and merge with a ramp from Perimeter Road. The three middle lanes become the Arrival Pick-Up lanes (Lower Level) and the parking entry. The entry lane configuration for Terminal Drive is detailed in Figure 17. The Upper and Lower Level are high conflict areas with multiple commercial vehicle weave/merge transitions and significant pedestrian traffic.

Perimeter Road

Perimeter Road is an urban major collector with a posted speed limit of 35 mph and runs adjacent to the perimeter of the entire airport. The north segment passes under I-595 and the south segment remains closed to public access. The west segment provides access to the Commercial Ground Transportation Holding Lot and the Aircraft Observation Area, and the east segment provides access to both levels of the terminal area.

Figure 17: Curbfront Access Roadways



SOURCE: Pictometry Online (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

The characteristics of each of the study area roadways are summarized in Table 1.

Table 1: Roadway Inventory Overview

Roadway	Description	Number of Lanes	Speed Limit	Roadway Type
I-595	Divided Interstate	8	65 mph	Airport Access Roadway
US 1/Federal Highway	Divided Principal Arterial	6	50 mph	Airport Access Roadway
Perimeter Road	Urban Major Collector	2	35 mph	Terminal Area Roadway
Terminal Drive	Circulator Roadway	2 to 6	15 mph	Curbfront

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

2.3 CURBFRONT INVENTORY

TERMINAL CURBFRONTS

The terminal has a two-level curbfront roadway providing access to the ticketing/check-in (departures) area on the upper level and the baggage claim (arrivals) area on the lower level. This curbfront provides access to a variety of travel modes including commercial and private vehicles. The section below summarizes the characteristics of the curbfront roadways. The curbfront layouts will be used to prepare the roadway and curbfront network for the simulation model.

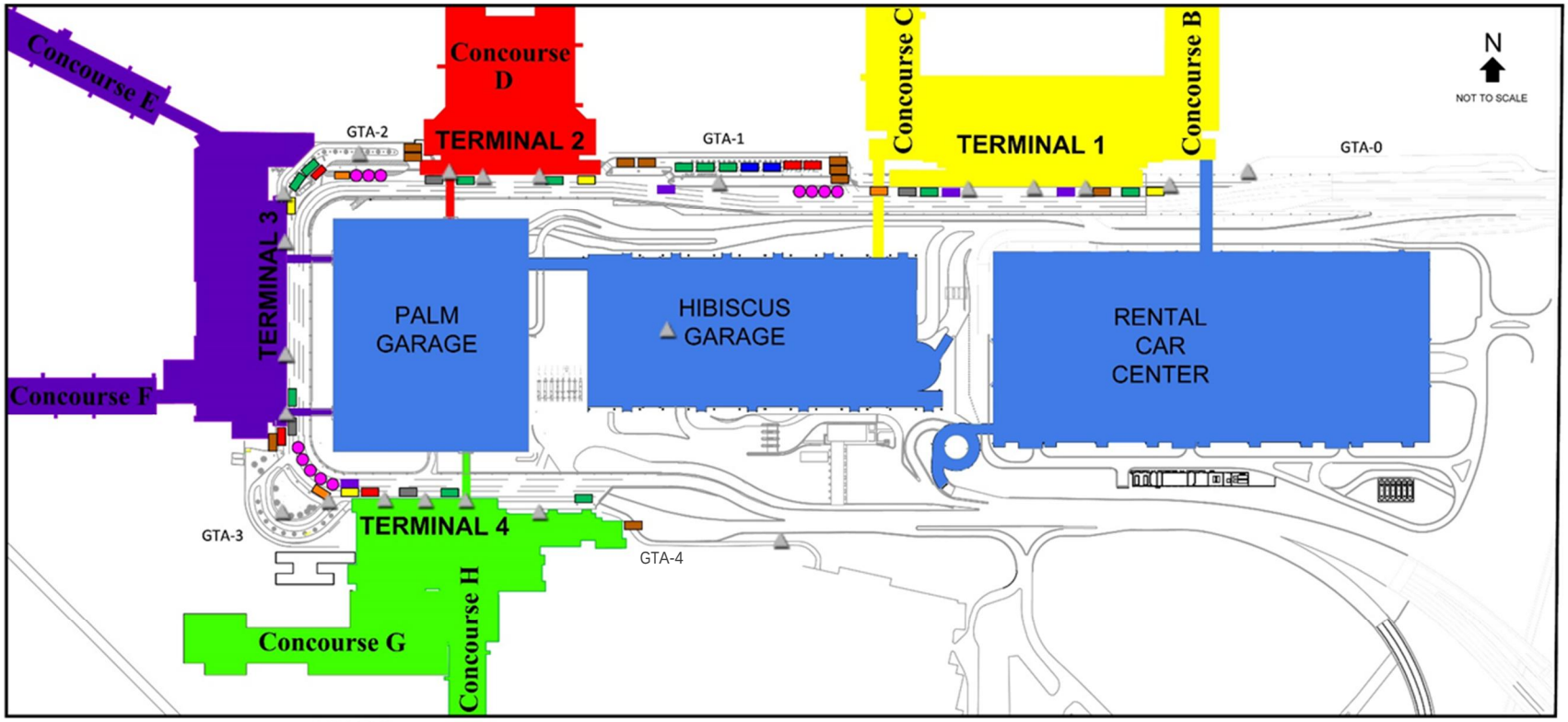
There are four terminals at FLL: Terminal 1, Terminal 2, Terminal 3, and Terminal 4. The terminals are further divided into Lower Level (Arrivals) and Upper Level (Departures). The traffic lanes connecting the terminals are divided into two basic functions. The curbfront lanes, or inside lanes, are typically used for passenger loading and unloading. The outside lanes, or traffic flow lanes, are used for orbiting and circulating traffic throughout the airport. The number of curbfront lanes vary from terminal to terminal. Table 2 provides a general description of each terminal curbfront configuration. Figure 18 and Figure 19 illustrate the terminal layouts (for clarity, only commercial, government, public transit, shared rides, and taxi staging areas are shown). Section 3.0 summarizes the vehicle types that currently utilize the curbfront.

Table 2: Curbfront Inventory Overview, Terminal Locations

Location	Description of Activity	Number of Lanes	
		Curbfront	Travel
Terminal 1			
Upper	Passenger drop-off	2	3
Lower	Passenger pickup	3	3
Terminal 2			
Upper	Passenger drop-off	2	3
Lower	Passenger pickup	2	3
Terminal 3			
Upper	Passenger drop-off	2	3
Lower	Passenger pickup	2	3
Terminal 4			
Upper	Passenger drop-off	2	3
Lower	Passenger pickup	2	3

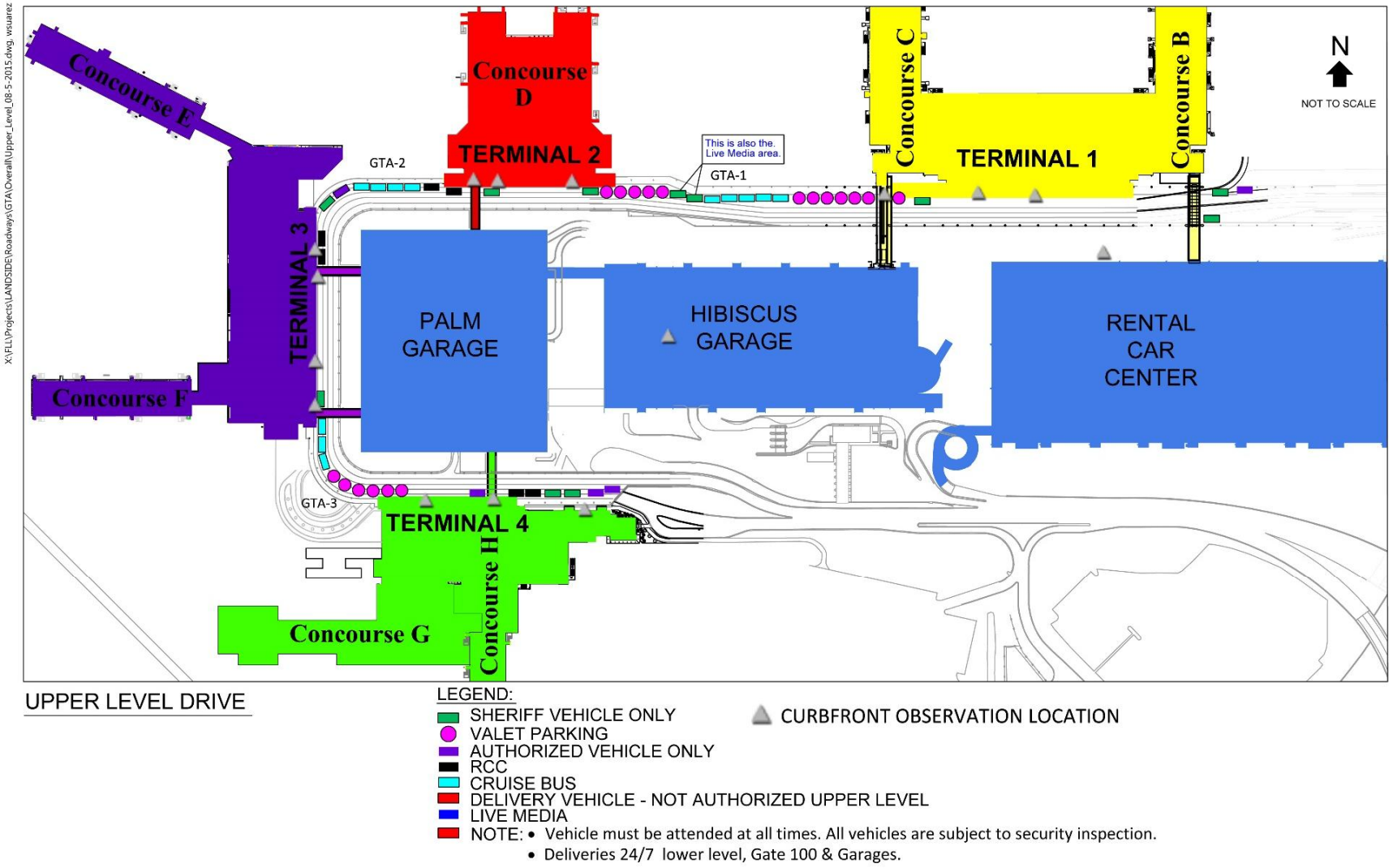
SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 18: Curbfront Layout - Lower Level (Arrivals)



SOURCE: Broward County Aviation Department (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 19: Curbfront Layout - Upper Level (Departures)



SOURCE: Broward County Aviation Department (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

GROUND TRANSPORTATION AREAS

Located between the four terminals are designated Ground Transportation Areas (GTAs): GTA-0, GTA-1, GTA-2, GTA-3, and GTA-4. Figure 18 shows the lower level GTAs and Figure 18 shows the upper level GTAs. Lane designations for each of the GTAs are detailed below and lane counts are provided in Table 3.

GTA-0

GTA-0 is located to the east of Terminal 1 on the lower level and is used solely for taxi staging. The curbfront designations include:

- The inside north lane is designated for taxicab staging.
- The inside south lane(s) are designated for taxi and share-ride vehicle staging.
- The middle lane is designated as a vehicle movement lane.

GTA-1

There is an upper level and lower level GTA-1 located between Terminal 1 and Terminal 2. The lower level curbfront designations include:

Inside Lanes (Traffic Flow Lanes)

- The west half of the south lane is used as a taxicab staging area.
- The lane marked with diagonal lines is used as a passenger/baggage loading area.
- The north lane is designated for authorized bus activities, loading and unloading.
- The middle lane is designated as a vehicle movement lane.

Outside Lanes (Curbfront Lanes)

- Loading Consolidated Rent-A-Car/Cypress Garage Shuttles – west end.
- Courtesy Vehicles (hotel, off-airport parking operators) – east end.
- Tri-Rail bus stop is located at the west end of Terminal 1 curb.

The upper level curbfront designations include:

- Loading and off-loading cruise/charter bus passengers.
- Other purposes with prior approval by BCAD.

GTA-2

There is an upper level and lower level GTA-2 located between Terminal 2 and Terminal 3. The lower level curbfront designations include:

Inside Lanes (Traffic Flow Lanes)

- Inside left lane Consolidated Rental Car shuttles pick-up.
- Inside right lane designated for courtesy vehicles (hotel & off-airport parking) pick-up.
- Single lane closest to Air Operations Area (AOA) wall is designated for taxicab staging.

Outside Lanes (Curbfront Lanes)

- Commercial Vehicle Loading Area.
- Tri-Rail stop is located on the west side.
- Economy and Inter-Terminal shuttle bus stops.

The upper level curbfront designations include:

- Cruise/charter bus passengers (loading and unloading).
- Consolidated Rental Car/Cypress Garage shuttles drop-off.
- Other purposes with prior approval by BCAD.

GTA-3

There is an upper level and lower level GTA-3 located between Terminal 3 and Terminal 4. The lower level curbfront designations include:

Inside Lanes (Traffic Flow Lanes)

- Consolidated Rent-A-Car/Cypress Garage shuttles – inner lane.
- Courtesy vehicles (hotel and off-airport parking) shuttle pick-up stop east-end of the single lane closest to the AOA wall.

Outside Lanes (Curbfront Lanes)

- Tri-Rail stop is located at the west-end of curb.
- Commercial Vehicle Loading Area.
- Economy Lot and Inter-Terminals shuttle bus stops.

The upper level curbfront designations include:

- Loading and unloading of cruise/charter buses.
- Designated baggage delivery truck loading/ unloading.
- Other purposes with prior approval by BCAD.

GTA-4

GTA-4 is located on the lower level east of Terminal 4. The curbfront designations include:

- Loading and unloading of hotel /motel shuttles.
- Loading and unloading of off-airport parking shuttles.
- Loading and unloading of Tri-Rail Shuttle and Sun Trolley.

Table 3: Curbfront Inventory Overview, GTA Curbfronts

Location	Description of Activity	Number of Lanes	
		Curbfront	Travel
GTA-0			
Lower	Taxi Staging	2	1
GTA-1			
Upper	Passenger drop-off	2	3
Lower	Passenger pickup	2	3
GTA-2			
Upper	Passenger drop-off	2	3
Lower	Passenger pickup	2	3
GTA-3			
Upper	Passenger drop-off	2	3
Lower	Passenger pickup	2	3
GTA-4			
Lower	Passenger pickup	2	3

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

2.4 SIGNAGE INVENTORY

The *Signage and Wayfinding Master Plan* was completed in January 2014 for FLL to inventory the existing signage for the airport approach, parking approach, curbfronts, and terminals. These documents assisted in completing a high-level analysis of potential existing issues that could adversely impact wayfinding into and out of the terminal complex. Figure 20 and Figure 21 highlight areas noted as major decision points where wayfinding improvements should be focused. The following excerpts regarding curbfront, terminal, access roadways and parking signs and respective wayfinding issues are taken from the *Signage and Wayfinding Master Plan*.

CURBFRONTS

The curbfronts represent a wayfinding challenge because of the volume and variety of vehicular and pedestrian traffic. With its single curb access design on each level, FLL is prone to heavy vehicular and pedestrian traffic volume and congestion at peak periods. Commercial and private vehicular traffic are intermingled along much of the curbfront extents. Curbfront entry doors offer an opportunity to provide orientation to passengers and motorists through a unique numbering system. Low light levels at the lower level (arrivals) level contribute to visibility issues. Signs identifying pedestrian crosswalks are placed at the driver's upper viewing range. In most areas, pedestrian crosswalks span five to six lanes, requiring center lane drivers to use peripheral vision.

Wayfinding signage should help drivers locate terminals, help drivers and passengers connect, and help passengers locate ground transportation options. In order to accomplish this, curbfront signage should be designed, scaled, and placed appropriately to serve both vehicular and pedestrian audiences.

Signs should prominently identify terminals at a distance for motorists. Individual terminal entry doors should each be prominently marked with a unique identifier to provide reference points for orientation and help passengers self-locate, connect with private vehicle pick-up, and find ground transportation options.

The report provided some of the following design guidelines for curbfront signage: 1) Clear designation for ground transportation traffic and general vehicular traffic, to separate pedestrian and private/commercial traffic 2) standardized signs 3) coordinate curbside signage with pavement marking 4) Prominent and unique terminal door entries 5) illuminated signs.

TERMINALS

Of all the areas studied at FLL, terminals seem to be the least confusing to passengers—particularly Terminals 2 and 3, which have fairly straightforward and intuitive layouts. Terminal 1, with its three-level design and walkway connections to the Rental Car Center and Hibiscus garage, requires more wayfinding. Terminal 4 includes the separate international arrivals area, which requires internal navigation.

Each terminal currently has its own unique interior sign system, with variations in size, color, materials and finishes, illumination, graphic layouts, and placement. Wayfinding signs share viewing space with—and in some cases are obstructed by—advertising and concessions. Existing directories vary in content, layout, design and location. Existing terminal signage is English only.

Design guidelines for the terminals included, but was not limited to, standardized signage design based on Terminal 4 standard, illumination of overhead directional signage, standard sign terminology, addition of terminal/retail directory locations, redesign of directory information for readability, and upgrade static directories to interactive platforms.

ACCESS ROADWAYS AND PARKING

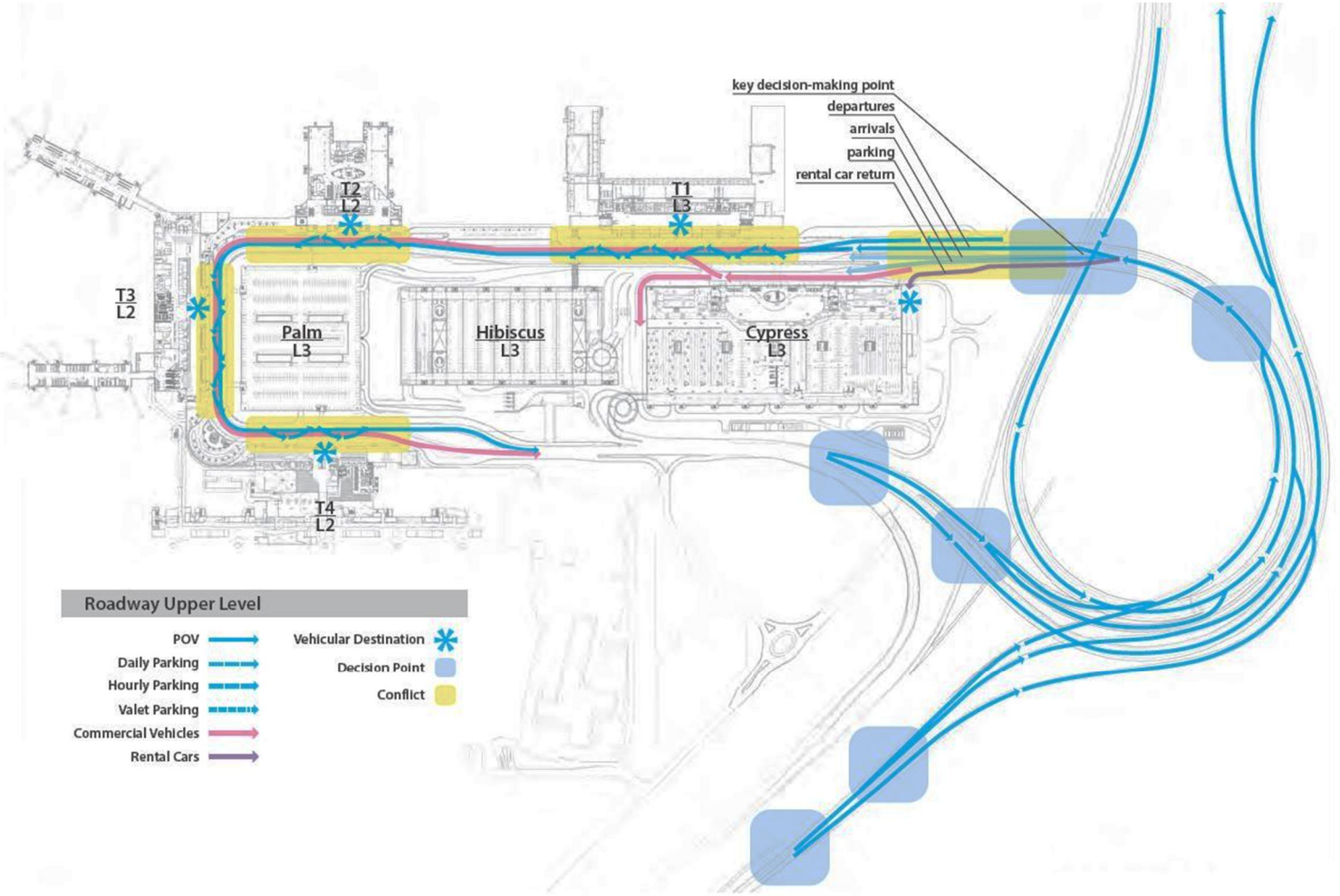
The roadway system has a high traffic volume with multiple destinations, lane splitting and merging and; horizontal and vertical road closures that result in limited site distances. Unmarked lane drops in the in the outbound roadway result in last minute weaving in the lanes. Since some of these issues are due to the roadway design, the issues cannot be fully addressed through wayfinding signage improvement.

Design guidelines for the access roadways included, but was not limited to, conformity to Florida Department of Transportation (FDOT) and Federal Highway Administration (FHWA) design standards, advance lane assignment, reinforcement of lane assignment on airport approach and, incorporation of dynamic messaging capability.

Within the airport, the roadway configurations along the lower ramp present drivers with a series of lane selection and turn options in a relatively short distance. Connectivity between the garages and terminals is a significant issue. Garage floor plates are large and visibility is limited. The architectural design and ambient light vary from structure to structure. Elevator and stair touch points are not always readily visible due to the floor layouts.

The report provided a number of garage signage design guidelines, including but not limited to, easily recognizable garage numbers/names, limit the amount of parking information on approach to garage, color coding for secondary reinforcement, prominent and highly visible elevator/stair touch points, clearly defined pedestrian walkways, more visible tram stops and standardized signs.

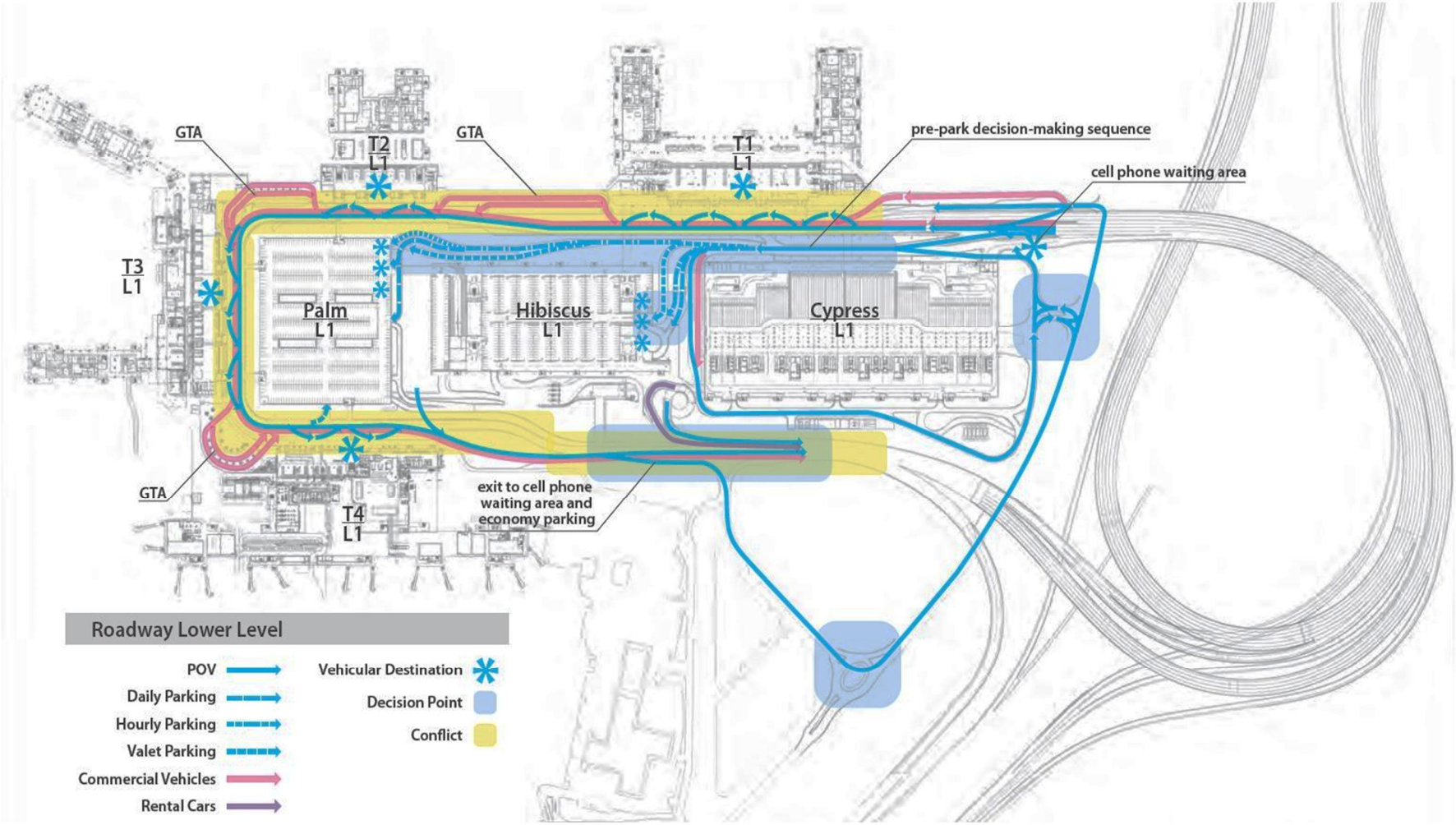
Figure 20: Roadway Documented Wayfinding – Upper Level (Departures)



SOURCE: Signage and Wayfinding Master Plan (2014)
PREPARED BY: Gresham, Smith and Partners

Note: Ramp G is now implemented. This drawing was prepared prior to the completion of Ramp G and does not reflect the current Ramp G configuration.

Figure 21: Roadway Documented Wayfinding – Lower Level (Arrivals)



SOURCE: Signage and Wayfinding Master Plan (2014)
PREPARED BY: Gresham, Smith and Partners

Note: Ramp G is now implemented. This drawing was prepared prior to the completion of Ramp G and does not reflect the current Ramp G configuration.

2.5 PARKING INVENTORY

Vehicle parking facilities support passenger terminals for passengers, visitors, employees, and rental cars. FLL offers several parking alternatives with pricing based upon length of stay. Passengers desiring to park private vehicles have their choice of either onsite or offsite parking. The FLL multi-level on-site parking complex has more than 11,000 spaces for hourly and daily parking. As illustrated in Figure 23, there are three onsite parking garages: Cypress, Hibiscus, and Palm. The airport economy lot and private lots are available for off-airport parking at a standard daily rate. The airport parking and off-airport parking will be assessed in the current Master Plan Update, but is summarized here for consistency with the Master Plan Inventory.

CYPRESS GARAGE

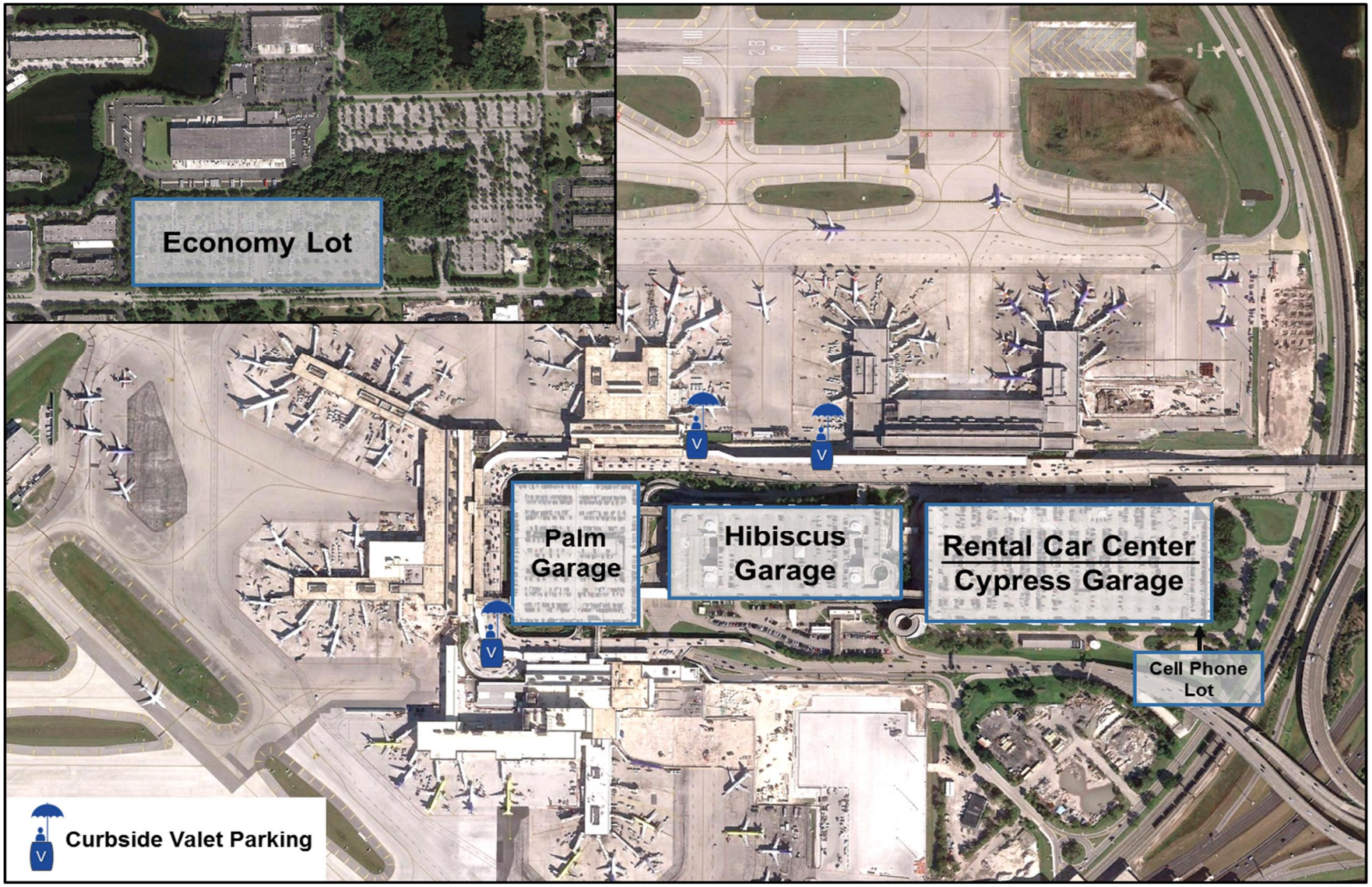
The Cypress garage, serving Terminal 1, offers daily parking, employee parking, valet parking, and the RCC return areas. Access to the rental car area is provided by the leftmost lane of Terminal Drive. Traffic entering the garage from Terminal Drive is prompted to follow signage to the appropriate car rental return area.

Entry to the upper levels is provided in three gated lanes located between the Cypress and Hibiscus garages as shown in Figure 22. Employee access is also provided through these gated lanes through an access control reader. For access to the upper levels of the Cypress garage vehicles must enter the Hibiscus garage, travel up to the top level, and then cross over to the Cypress garage via a connection bridge.

Figure 22: Hibiscus/Cypress Entry and Employee Access

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 23: Parking Options at FLL



SOURCE: Google Earth (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

There are currently 4,192 parking spaces within the garage, with 3,143 spaces reserved for employee parking. Egress is provided by exiting down the helix ramp merging with the terminus of Terminal Drive. The average overnight parking occupancy, for the month of November 2015 was 43% of the available parking supply and 45% for March.

HIBISCUS GARAGE

Hourly and daily parking is available in the Hibiscus garage which serves all FLL terminals. Access is provided by the second inside lane of Terminal Drive. Traffic entering the garage from Terminal Drive is prompted to follow signage to the entrance depending on length of stay (e.g. long-term, short-term). The long-term levels are accessed via the consolidated entry gates identified in Figure 22 above. The short-term levels are accessed via a separate entry on Level 2. Limited employee parking is also provided in the Hibiscus garage on Level 2.

There are 4,589 parking spaces within the garage. The average level of overnight (midnight) utilization of these facilities for the month of November 2015 was 64% of the available parking supply and 72% for March. Egress is provided through the main consolidated exit facility.

PALM GARAGE

The Palm garage serves Terminal 2, 3, and 4 offering both hourly and daily parking. Access is provided by the second inside lane of Terminal Drive. Traffic entering the garage from Terminal Drive is prompted to follow signage to the entrance depending on length of stay. There are 2,501 parking spaces within the garage. The average level of overnight (midnight) utilization of these facilities for the month of November 2015 was 73% of the available parking supply and 39% for March. Egress is provided through the main consolidated exit facility.

VALET

At the time of the data collection in November 2015 the valet operations recently relocated their operations from the Palm garage to the terminal curbfronts. Valet customers drop their vehicles at the upper level curbfronts. Upon their return valet customers are directed to call the valet once they have retrieved their bags. Then customers pick up their vehicles at the upper level curbfronts at the same location as their arrival terminal.

Figure 24: Curbfront Valet Operations

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

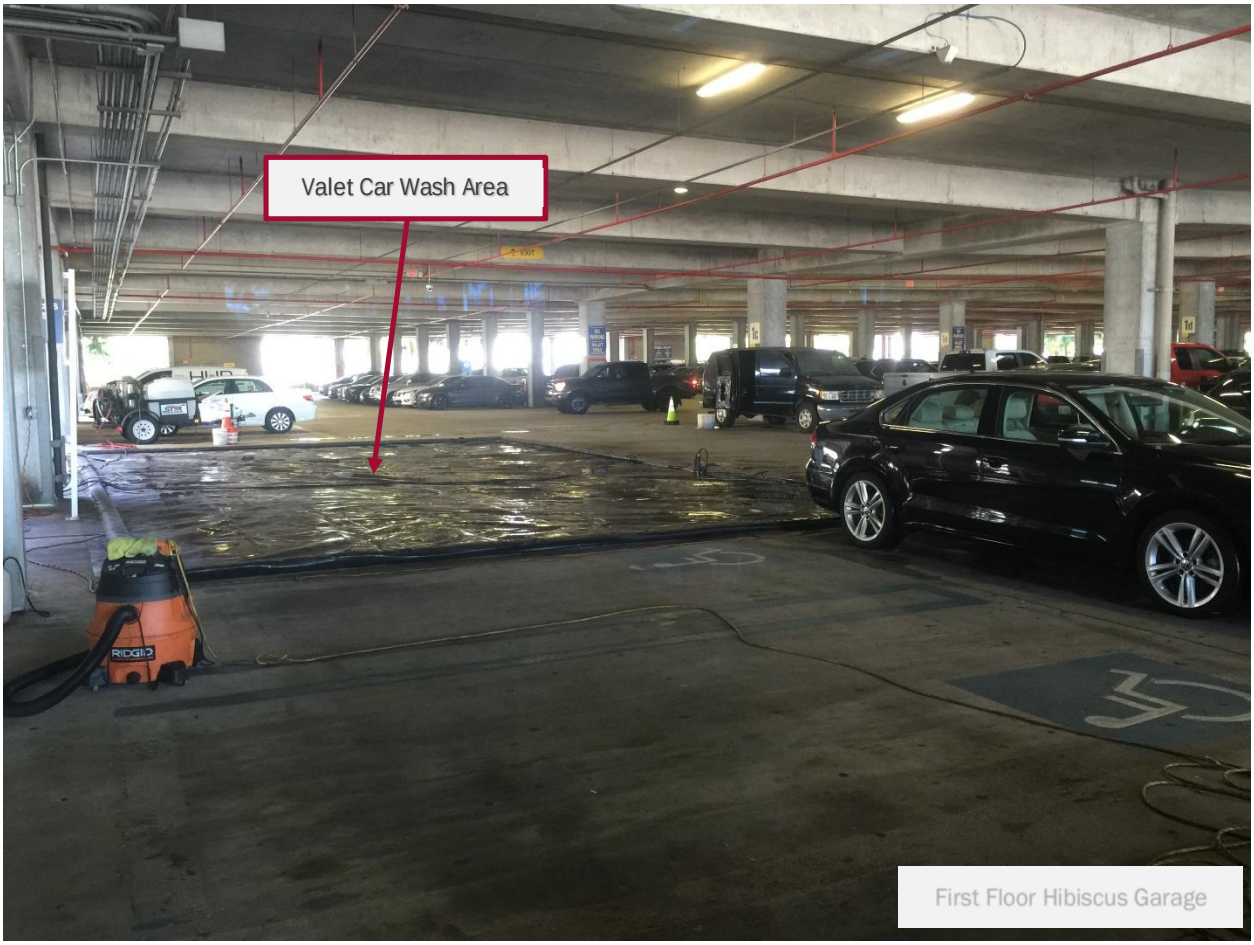
The valet drivers use Perimeter Road and backroads for access to the valet lot on Level 1 of the Hibiscus garage. If the valet lot on Level 1 is full, valet drivers will use the remote lots and will not turn away any valet patrons. Specifically, after vehicles are dropped at the curb, valet drivers exit the upper level terminal curbfront, recirculate back to the terminal area, follow signs to the lower level curbfront/parking, use the internal circulation roadway between the Hibiscus and Cypress garages, and enter at the valet checkpoint booths (Figure 25). At the valet checkpoint booth, a "5-point inspection" occurs where the vehicle condition is documented with camera images. Following the inspection, vehicles enter the first level of the Hibiscus garage at a separate, designated valet entry.

Figure 25: Valet Entry Checkpoint Booth

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Valet patrons also have the option of getting vehicles serviced with minor maintenance such as oil changes or obtain carwashes. The carwash functions are currently located at the first floor of the Hibiscus garage as shown in Figure 26.

Figure 26: Valet Carwash Area



SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Upon the customer's return, valet drivers travel the reverse route exiting the Hibiscus garage in a designated entry/exit on the south side of the lot, exiting the terminal area curbfront/parking area, recirculating back to the upper level curbfront to meet the customer at the upper level.

ECONOMY LOT

The economy lot is a remote surface lot located west of the airport. There are approximately 4,010 parking spaces provided. Access is provided by a one lane entry plaza accessible directly from Southwest 42nd Street. The average level of utilization for this parking facility for the month of November 2015 was 42% of the total supply and 34% for March. Shuttle service to and from the terminals is provided to customers free of charge. Egress is provided through an exit plaza that consists of three cashiered lanes.

PRIVATE OFF-AIRPORT PARKING

Off-airport private parking lots are provided for Port Everglades parking, cruise parking, and airport parking. Shuttle service is provided to customers free of charge. Rates and locations of off-airport parking providers are detailed in the table below:

Table 4: Off-site Parking Providers

Parking Provider	Location	Parking Type	Daily Rate
Hilton Garden Inn	180 Southwest 18th Avenue	Outdoor Lot; Self-Park	$5
Luxury Airport Parking	339 Southeast 24th Street	Outdoor Lot, Self-Park and Valet	$11
US1 Airport Parking	2720 S Federal Highway	Outdoor Lot; Valet Parking	$10
Park by the Ports	4160 Ravenswood Road	Outdoor Lot; Valet Parking	$10
Park N Go	1101 Eller Drive	Outdoor Lot, Self-Park and Valet	$12
Park N Fly	2200 Northeast 7th Avenue	Outdoor Lot, Self-Park and Valet	$12
Sheraton Hotel	1825 Griffin Road	Outdoor Lot; Self Park	$14
Gold Coast Cruise and Fly Parking	3000 Southeast 6th Avenue	Outdoor Lot; Valet Parking	$19
FLL Park Safe	901 Old Griffin Road	Indoor and Outdoor Lot, Self-Park and Valet	Valet: $13 Covered: $15
Roadway Inn & Suites	2440 W State Road 84	Outdoor Lot; Self Park	$34

SOURCE: Online Search, www.bestparking.com (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

PARKING ACCESS

Access to the onsite parking garages is provided from the left lane of Terminal Drive as shown previously in Figure 17. Once drivers descend to the lower level towards the parking entry, the leftmost lane provide circulation to the Cell Phone Lot and Airport Exit. The second from the left lane leads drivers to the Long Term parking for the Hibiscus Garage. The third lane leads to the short-term parking area of the Hibiscus Garage. The fourth lane directs drivers to the parking options for the Palm Garage. Valet curbside parking is available on the Departure Level outside of Terminal 1, Terminal 2, and between Terminals 3 and 4, as shown in Figure 23.

The figure below displays lane designations for both hourly and daily parking options for the Palm and Hibiscus. In addition, a secondary parking access point is provided from a median opening west of Terminal 1. Figure 27 below shows this parking access as well as a driveway opposite GTA-1 that allows drivers to reenter Terminal Drive from the parking entrance.

Real-time parking availability is communicated to drivers via the Park Assist parking guidance and management system. The entrance to the Hibiscus garage is furnished with a digital display communicating the number of available spaces. Additionally, each aisle is equipped with color-coded lights identifying each space as open, occupied, reserved or handicapped.

Figure 27: Parking Access

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 28: Secondary Parking Access

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

PARKING INVENTORY

Table 5 depicts the current inventory of parking spaces at FLL. Average monthly overnight utilization of facilities was derived from occupancy counts conducted daily at midnight. The utilization numbers shown in Figure 29 and Figure 30 are the average volume of parked vehicles for November 2015 by parking facility and parking designation, derived from the midnight occupancy.

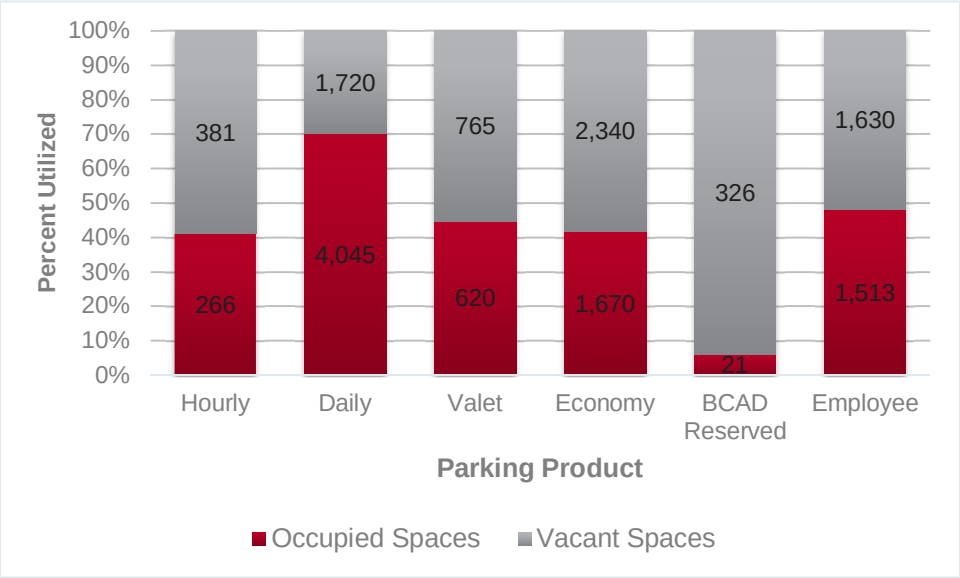
Table 5: Parking Space Inventory – November 2015

Parking Facility	Location	Number of Parking Spaces	% of Total Parking Supply (1)
Cypress Garage		4,192	27.4%
Daily (Handicap)	Level 6	24	0.2%
Valet(2)	Level 6	1,025	6.7%
Employee	Levels 7, 8, and 9	3,143	20.6%
Hibiscus Garage		4,589	30.0%
Valet(2)	Level 1	360	2.4%
Hourly	Level 2	182	1.2%
Daily	Levels 3 – 7	3,749	24.5%
Reserved	Level 1, 2, and 6	298	1.9%
Palm Garage		2,501	16.4%
Hourly	Level 1	465	3.0%
Daily	Levels 2, 3, and 4	1,992	13.0%
Reserved	Level 3	44	0.3%
Remote Economy Lot		4,010	26.2%
Total		15,292	100%

Notes: (1) Percentage totals may not total 100% due to rounding. (2) In November 2015, valet operations just became operational from the terminal curbfront; changes to the parking locations between lots is anticipated.

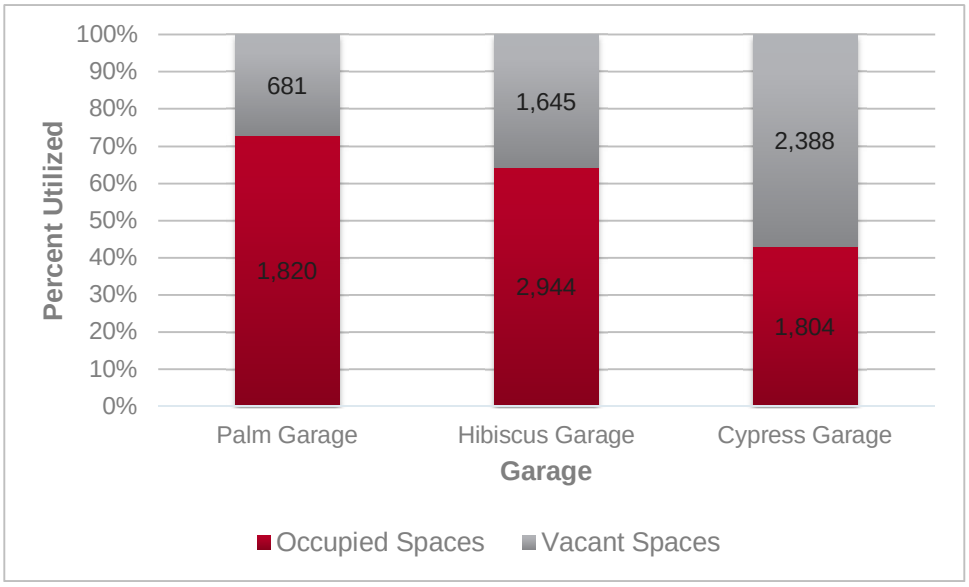
SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 29: Average Monthly Percent Overnight Utilization by Parking Designation – November 2015



SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 30: Average Percent Utilization for Onsite Garages – November 2015



SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

The Prime Consultant for the current Master Plan Update, Ricondo & Associates, Inc., has identified March as the design month. Therefore, a similar parking analysis was conducted using parking data supplied by SP+ to assess utilization of onsite and offsite parking for March 2015. Fluctuations in the number of parking spaces is a common occurrence at FLL as designations change and reconfiguration on levels occurs. For example, there have been shifts in valet parking spaces and locations with the shift in operations from the garage to the terminal curbfront. As a result the amount of parking available during the month of March differs than that available in

November and is presented in Table 6 below. Figure 31 and Figure 29 show the utilization percentage by parking facility and parking designation for March 2015.

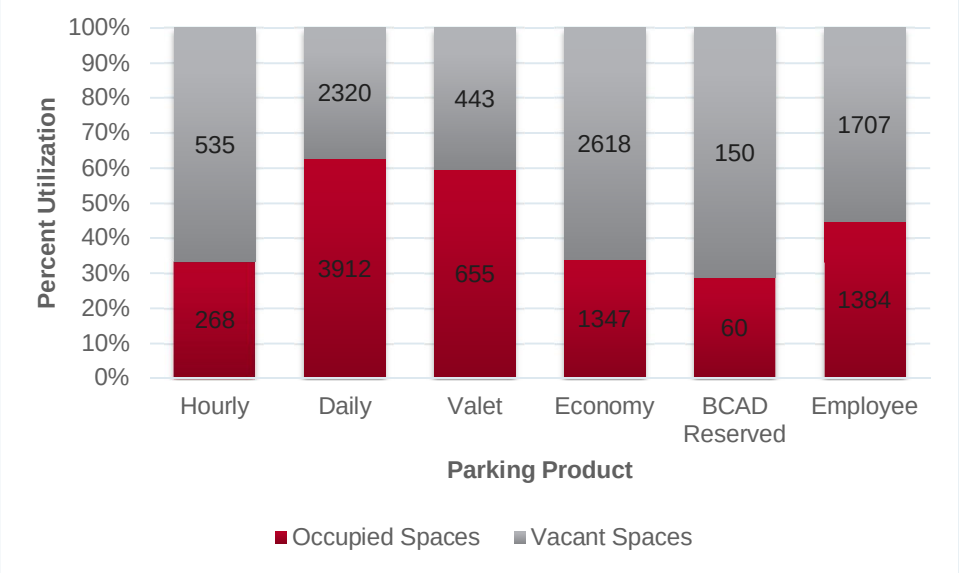
Table 6: Parking Space Inventory – March 2015

Parking Facility	Location	Number of Parking Spaces	% of Total Parking Supply(1)
Cypress Garage		4,192	27.3%
Daily	Level 6	1,101	7.2%
Employee	Levels 7, 8, and 9	3,091	20.1%
Hibiscus Garage		4,449	29.0%
Daily	Levels 1 – 7	3,760	24.5%
Valet(2)	Level 1	291	1.9%
Hourly	Level 2	228	1.5%
Reserved	Level 6	170	1.1%
Palm Garage		2,753	17.9%
Hourly	Level 1	575	3.7%
Daily	Levels 2, 3, and 4	1,371	8.9%
Valet(2)	Level 3	807	5.3%
Remote Economy Lot		3,965	25.8%
Total		15,359	100%

Notes: (1) Percentage totals may not total 100% due to rounding. (2) In November 2015, valet operations just became operational at the terminal curbfront; changes to the parking locations between lots is anticipated.

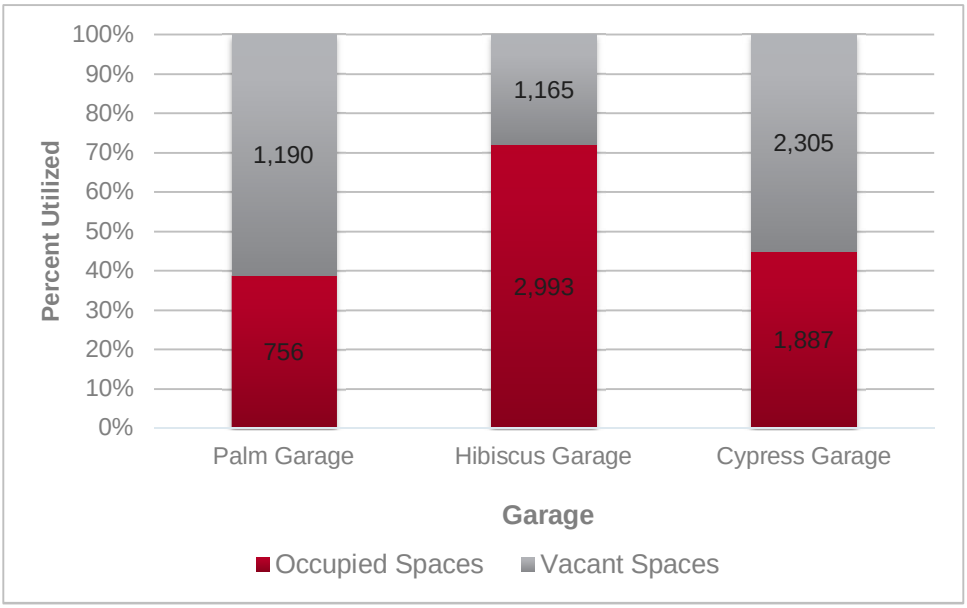
SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 31: Average Percent Utilization by Parking Designation – March 2015



SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 32: Average Percent Utilization for Onsite Garages – March 2015



SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Information was also collected regarding the duration of the parking stays. The duration by parking location is shown in Table 7 and Table 8. The average length of stay for the Economy Lot is 4 days 9 hours, the average length of stay for onsite garages is 1 day 3 hours.

Table 7: Economy Lot Length of Stay – November 2015

Parking Duration	Count	% of Total Parking Supply(1)
6 hours	411	4%
12 hours	193	2%
24 hours	111	1%
1 - 2 Days	190	2%
2 - 3 Days	1241	11%
3 - 4 Days	2203	20%
4 - 5 Days	2587	24%
5 - 6 Days	1598	15%
6 - 7 Days	744	7%
7 - 8 Days	541	5%
8 - 9 Days	377	3%
9 - 10 Days	237	2%
10+ Days	486	4%
Total	10,919	100%

Notes: (1) Percentage totals may not total 100% due to rounding.

SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 8: On-airport Self-Parking Length of Stay – November 2015

Parking Duration	Count	% of Total Parking Supply(1)
0.5 - 1 Hours	46,091	43%
1 - 2 Hours	17,545	16%
2 -3 Hours	2,953	3%
6 hours	1,923	2%
12 hours	2,689	2%
24 hours	2,671	2%
1 - 2 Days	3,304	3%
2 - 3 Days	8,918	8%
3 - 4 Days	8,799	8%
4 - 5 Days	6,443	6%
5 - 6 Days	3,130	3%
6 - 7 Days	1,309	1%
7+ Days	1,928	2%
Total	107,703	100%

Notes: (1) Percentage totals may not total 100% due to rounding.

SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

CONSOLIDATED EXIT PLAZA

The Consolidated Exit Plaza serves customers exiting from the Hibiscus and Palm parking garages. The Consolidated Exit Plaza is configured into two distinct parts: the main plaza has nine lanes not protected by an overhead structure and three lanes are separated from the main plaza under a structure. Seven lanes are configured with a cashiered booth, however, all lanes are also configured for non-cashiered exiting where the customer inserts their parking ticket into the exit column and pays the parking fee due via credit card.

Figure 33: Consolidated Exit Plaza

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Processing times for the exit lanes were collected on Thursday, December 17, 2015. Table 9 presents a summary of the processing times for each lane and its respective payment type. The average processing times for the cash lanes is 37.3 seconds, Sunpass lanes 15.5 seconds, and the credit card lanes 34.8 seconds. During these observations no significant queues were observed and more than adequate space was available to process the demands. There were some instances of driver confusion when they entered wrong lanes (e.g. Sunpass) and had to reverse to access a different lane. In those instances, temporary congestion occurred.

Table 9: Exit Plaza Processing Times

Lane Number	Payment Type	Average Processing Time (seconds)
1	Credit Card, Prepaid, SunPass	16.9
2	Credit	50.7
3	Cash Only	44.0
4	Cash Only	35.3
5	Cash Only	40.1
6	SunPass	13.9
7	Credit(1)	36.9
8	SunPass(2)	19.5
9	SunPass(2)	13.0
10	Cash Only	29.9
11(3)	Closed	-
12(3)	Self-Serve, Credit Card or Prepaid	-

Notes: (1) Alternate payment accepted: Prepaid. (2) Alternate payment accepted: Credit Card and Prepaid. (3) Lane closed due to software malfunctions.

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

CELL PHONE LOT

The cell phone lot is located east of Terminal 1 and is sheltered by the airport entrance overpass. The lot is unmonitored, has 48 parking spaces and no time limit for vehicle dwelling is enforced. Turnover rate for the cell phone lot was collected on Thursday, December 17, 2015 from 6:00 PM – 8:00 PM and is presented in the table below.

Table 10: Cell Phone Lot Average Statistics – Two-Hour Period

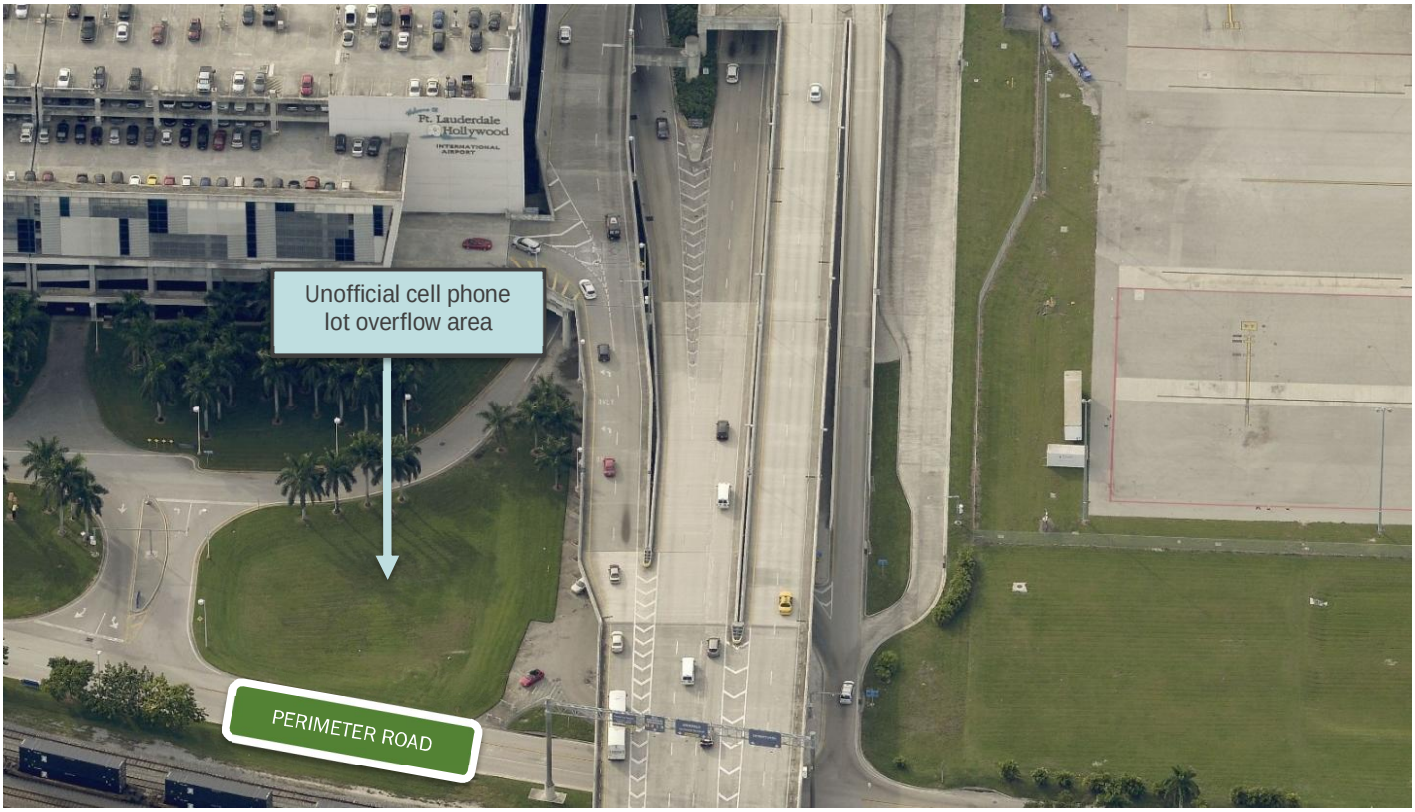
Statistic	Average
Dwell Time	5 minutes 53 seconds
Turnover	10 cars/space/hour
Percent Occupancy	91%

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Traffic counts were collected at the entrance and exit of the cell phone lot on Thursday November 19, 2015. Based on a review of the entry and exit volumes, the lot capacity exceeded 100% during 27 consecutive 15-minute intervals (nearly 7 hours) throughout that Thursday.

Stakeholder meetings with BCAD Ground Transportation staff revealed drivers will routinely use the grassy area adjacent to the cell phone lot as unofficial overflow parking, as shown in the figure below. These situations will prompt BCAD staff and authorities to strategically position cones to deter parking in the grass as traffic congestion will spill over onto Perimeter Road.

Figure 34: Cell Phone Lot Overflow Area



SOURCE: Pictometry Online (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

EMPLOYEE PARKING

Employees currently park on levels 7, 8 and 9 of the Cypress garage. Access to the employee lot is through the consolidated parking entry location between the Cypress and Hibiscus garages. Employees raise the gates with the proximity card reader co-located at the left two lanes of the entry plaza. To access the upper levels of the Cypress garage, employees must travel to the top of the Hibiscus garage and then travel over a bridge connecting to the two levels. The employee parking is subject to change as the overflow lot of the Economy Parking Lot may be the new parking area for some employees. If employees are relocated, then employees will then be bused from this lot to the terminals. This will open over additional public spaces in the Cypress Garage for passenger parking. In addition to the employee parking in the Cypress garage, there is limited BCAD Staff parking in Level 2 of the Hibiscus Garage.

Exactly 3,143 parking spaces are dedicated to employee parking. Currently, there are 10,998 active employee permits yielding an annual revenue of $1,470,000. The average hourly usage of the employee lot is provided in the table below. This table provides the average number of entries, exits and lot utilization for each hour of a 24-hour period, over the span of one month. As shown in Table 11, the most critical time period during the day is near 11:00 am, where the lot is almost at capacity.

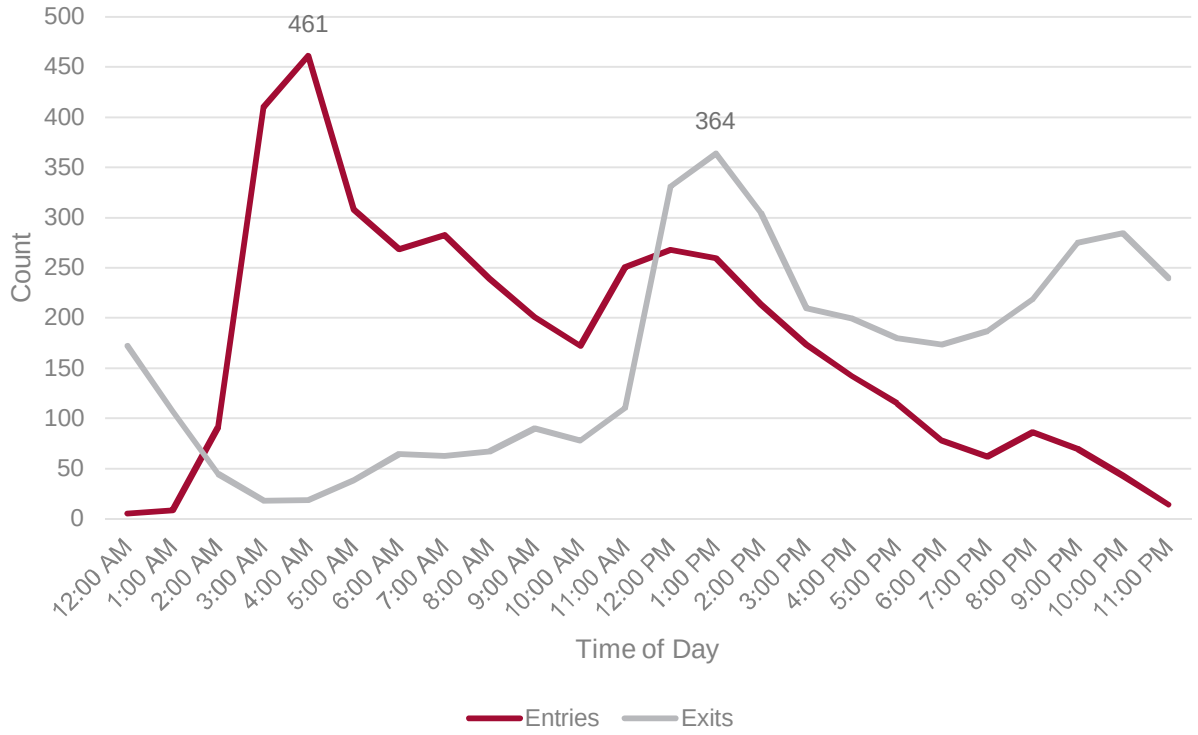
Table 11: Average Hourly Employee Parking Usage – November 2015

Hour	Average Entry	Average Exit	Average No. of Parking Spaces Used
12:00am	4	155	1,210
1:00am	8	97	1,125
2:00am	80	41	1,176
3:00am	357	16	1,533
4:00am	401	16	1,928
5:00am	268	34	2,170
6:00am	233	56	2,356
7:00am	246	55	2,555
8:00am	209	59	2,711
9:00am	176	78	2,812
10:00am	156	70	2,926
11:00am	225	100	3,048
12:00pm	241	298	2,987
1:00pm	234	329	2,890
2:00pm	193	276	2,807
3:00pm	157	188	2,771
4:00pm	128	181	2,716
5:00pm	103	163	2,652
6:00pm	70	157	2,561
7:00pm	56	168	2,444
8:00pm	78	197	2,317
9:00pm	63	246	2,127
10:00pm	39	254	1,902
11:00pm	13	216	1,644
DAILY AVERAGE	***156***	***144***	***2,307***

SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

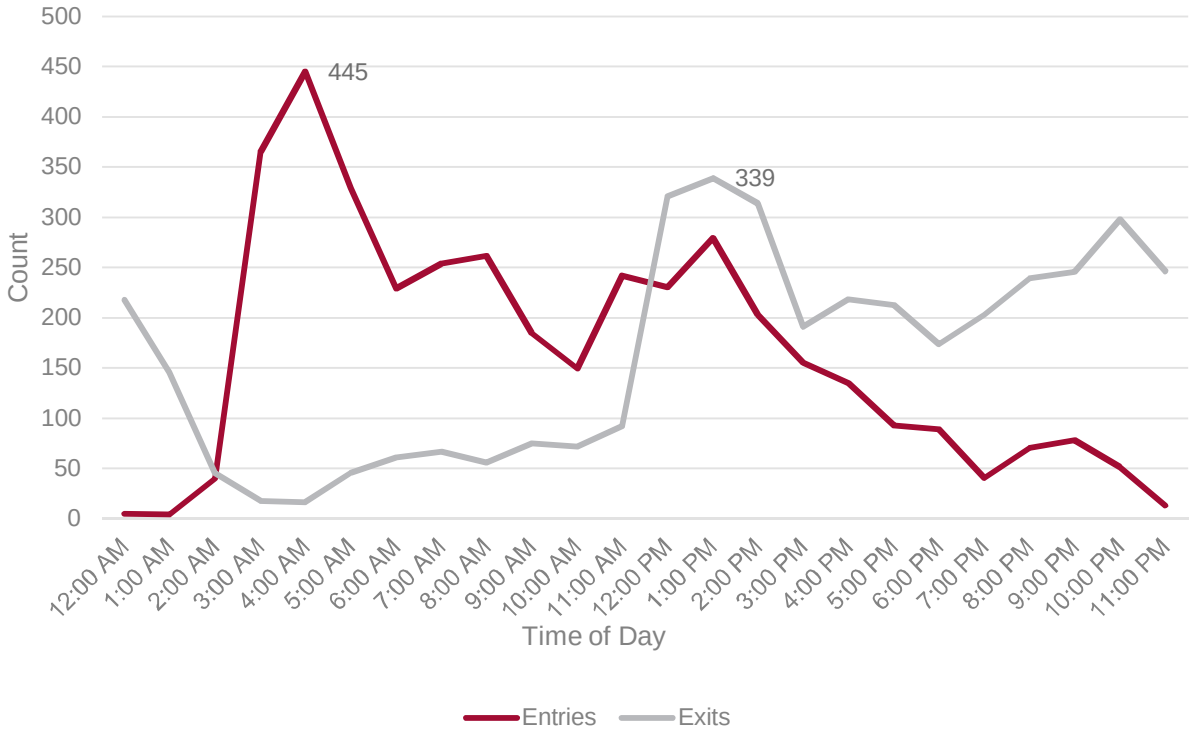
The Cypress garage employee entrance and exit report was provided and the distribution is provided in the graphs below. Distributions for both November and March are provided.

Figure 35: Employee Entry and Exit Distribution (Cypress Garage) – November 2015



SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 36: Employee *Entry and Exit Distribution (Cypress Garage) – March 2015*



SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

RENTAL CAR CENTER

Twelve rental car companies are located in the RCC opposite Terminal 1:

- Advantage Rent A Car
- Alamo
- Avis
- Budget
- Dollar
- Enterprise
- E-Z Rent
- Hertz
- National
- Payless
- Royal
- Thrifty

Currently all on-airport rental car companies have exclusive ticket counters on Level 3 or 4 of the RCC and individual rental return areas within the Cypress Garage. Passengers are transported between the rental car facilities and the terminal buildings by shuttle buses, with the exception of Terminal 1 which is accessed via a direct pedestrian bridge.

The total number of contracts by rental company were provided and are detailed below for the month of March and November. Alamo and Hertz combined secure over 30% of the rental contracts during these two months.

Table 12: Rental Car Contracts

Rental Company	March 2015 Contracts	Percentage (March Contracts)	November 2015 Contracts	Percentage (November Contracts)
Advantage Rent A Car	3,220	2%	3,881	3%
Alamo	25,320	15%	22,352	17%
Avis	19,129	11%	16,351	12%
Budget	20,551	12%	15,928	12%
Dollar	13,004	8%	10,063	8%
Enterprise	16,877	10%	12,349	9%
E-Z Rent	7,025	4%	4,729	4%
Hertz	31,159	19%	21,425	16%
National	18,125	11%	14,364	11%
Payless	3,155	2%	2,737	2%
Royal	2,348	1%	1,231	1%
Thrifty	7,608	5%	5,488	4%
Total[(1)]	167,521	100%	130,898	100%

Notes: (1) Percentage totals may not total 100% due to rounding.

SOURCE: Broward County Aviation Department and SP+ (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

2.6 PUBLIC TRANSIT INVENTORY

Three public transit services provide transportation to FLL: South Florida Regional Transportation Authority (SFRTA) Tri-Rail shuttle, Broward County Transit (BCT), and the Fort Lauderdale Sun Trolley. The route, schedule, and average headway for these three transit providers is summarized in the Table 13.

Table 13: Public Transit Inventory

Route Information	Transit Service Option		
	Tri Rail Shuttle	BCT Route 1	Sun Trolley
Description	Four stop locations: Terminal 1, Terminal 2&3, and Terminal 4. Stop at Terminal 4 will be eliminated when GTA-4 closes.	The bus stop is located at the Rental Car Center, Stop 7	Stops at all GTAs
Schedule	Daily: 4:20 AM - 11:00 PM Frequencies range from 5 to 30 minutes	Weekdays & Saturday: 5:30 AM - 11:45 PM Sunday: 6:20 AM - 9:45 AM Frequency: 20 minutes	Saturday and Sunday: 9:00 AM - 4:00 PM Frequency: 1 hour

SOURCE: Online Search (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

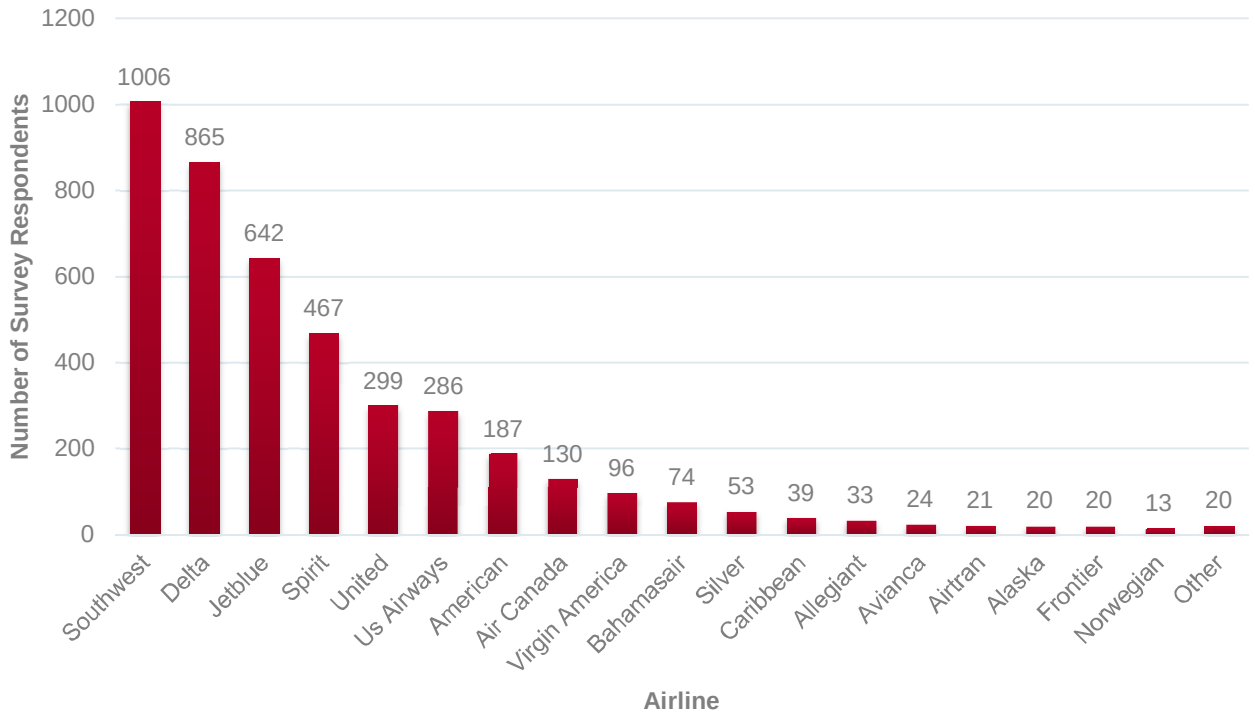
The characteristics of other commercial vehicles are provided in Section 3.2.

2.7 PASSENGER INVENTORY

The 2014 FLL Air Passenger Survey conducted by Landrum & Brown is summarized in the following section. The survey was conducted from July 30th to August 18th, 2014 collecting the data necessary for analysis to establish passenger profiles (i.e., passenger processing characteristics) including how passengers access the airport, the purpose of their trip, how early they arrive, how much time they spend in the terminal, how they use the ticketing and security areas, and their baggage handling choices. The survey sampling plan was designed to be a representative sample of the departing passenger profile at FLL during the peak summer months. In total 4,295 completed surveys were determined to be useable for the purposes of determining departing passenger characteristics.

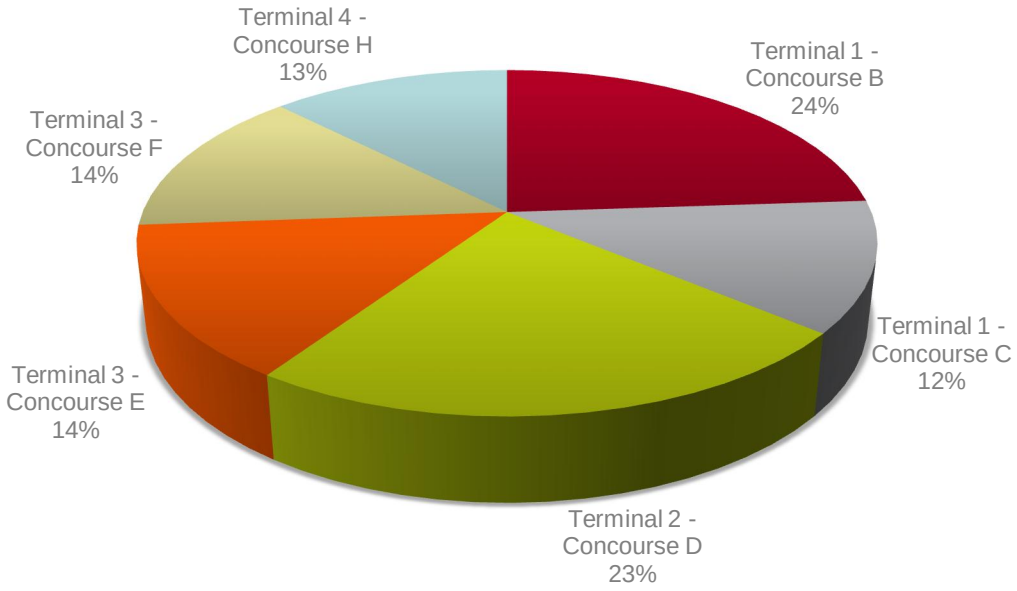
Of the 4,295 completed surveys, almost 25% were Southwest airline passengers. Figure 37 below shows the distribution of respondents by airline. In addition Figure 38 below shows the distribution of respondents by Concourse Area.

Figure 37: Airline Distribution



SOURCE: FLL Passenger Survey (2014)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 38: Concourse Distribution



SOURCE: FLL Passenger Survey (2014)
PREPARED BY: Kimley-Horn and Associates, Inc.

The passenger survey was reviewed to obtain passenger and visitor characteristics for the simulation model. The passenger survey data used in the model is summarized below. Within the simulation model, the flight schedule is used to generate passenger activity. The passenger characteristics collected within the survey data will be applied to the passengers generated from the flight schedule to populate the model. Specifically, as a part of the Master Plan Update, Ricondo & Associates is preparing Peak Month Average Day (PMAD) flight schedules. A March 2015 PMAD flight schedule and a 2020 PMAD flight schedule will be prepared and used in the simulation model.

TRAVEL PARTY SIZE

The passenger survey asked participants to identify the number of people travelling in their party. The average travel party size was 2.43 persons per party. Table 14 presents the distribution of travel party size reported in the survey. The distribution of travel parties is incorporated into the simulation model as "people packs."

Table 14: Average Travel Party Size

Travel Party Size	Number of Respondents	% of Responses(1)
1	1,766	41.3%
2	1,098	25.7%
3	605	14.1%
4	347	8.1%
5	215	5.0%
6	92	2.1%
7	44	1.0%
8	32	0.7%
9	19	0.4%
10 or more	62	1.4%

Notes: (1) Percentage totals may not equal 100% due to rounding.
SOURCE: FLL Passenger Survey (2014)
PREPARED BY: Kimley-Horn and Associates, Inc.

VISITOR ACTIVITY

Airport visitors that accompany an originating passenger (well-wishers) or meet a terminating passenger (meeter/greeter) have trip activity associated with air passengers The visitor ratios from the passenger survey, i.e. the number of visitor per air passenger, by airline for the well-wishers is presented in Table 15.

The visitor ratios are applied to the passenger activity in the model to determine the number of visitors modeled. In addition to the visitor ratios, the percentage of air passengers that travel with visitors is also incorporated into the model. Twenty-five percent of departing passengers were accompanied to the airport by well-wishers with an average well-wisher party size of 0.55 persons. In addition, the ratio of average well-wishers per passenger for well-wishers entering the terminal is presented in Table 15.

Table 15: Well Wisher Ratio, by Airline

Airline	Terminal	Number of Passengers Surveyed	Total # of Well Wishers in Terminal	Well Wishers Entering Terminal Ratio(1)
Air Canada	2	130	87	0.67
Air Jamaica	4	2	2	1.00
AirTran	4	21	5	0.24
Alaska	1	20	5	0.25
Allegiant	1	33	10	0.30
American	3	186	101	0.54
Avianca	4	24	9	0.38
BahamasAir	3	74	29	0.39
Caribbean	4	39	20	0.51
Condor Flugdienst	2	11	9	0.82
Copa	4	2	0	0.00
Delta	2	865	377	0.44
Frontier	1	20	25	1.25
Jetblue	3	642	617	0.96
Norwegian	3	13	5	0.38
Silver	1	53	24	0.45
Southwest	1	1004	441	0.44
Spirit	4	464	288	0.62
United	1	299	128	0.43
US Airways	3	286	115	0.40
Virgin America	1	96	45	0.47
West Jet	1	5	7	1.40

Note: (1) The well wisher ratio represents the number of well wishers per air passenger. For example, a well wisher ratio of 0.5 represents 0.5 well wishers per air passenger. Therefore for a flight with 100 air passengers, 50 well wishers would be generated based on the 0.5 well wisher ratio.

SOURCE: FLL Passenger Survey (2014)
PREPARED BY: Kimley-Horn and Associates, Inc.

BAGGAGE CHARACTERISTICS

The passenger survey also collected information regarding passenger's baggage, both checked bags and carry-on bags. Table 16 presents the percent of passengers, by airline, with each type of bag. The average number of carry-on bags is 1.95 bags per person and the average number of checked bags per traveling party is 1.75 bags per person. Southwest Airlines passengers account for over 25% of both checked and carry-on baggage.

Table 16: Baggage Distribution, by Airline

Airline	Checked Bag	% of Checked Bag	Carry-On Bags	% of Carry-On
Air Canada	275	3.7%	318	3.8%
Air Jamaica	8	0.1%	4	0.0%
AirTran	22	0.3%	29	0.3%
Alaska	29	0.4%	39	0.5%
Allegiant	13	0.2%	46	0.6%
American	297	4.0%	401	4.8%
Avianca	98	1.3%	48	0.6%
BahamasAir	304	4.1%	218	2.6%
Caribbean	145	1.9%	74	0.9%
Condor Flugdienst	29	0.4%	26	0.3%
Copa	3	0.0%	4	0.0%
Delta	1366	18.3%	1849	22.1%
Frontier	32	0.4%	28	0.3%
Jetblue	1040	13.9%	1103	13.2%
Norwegian	38	0.5%	40	0.5%
Silver	55	0.7%	92	1.1%
Southwest	2118	28.3%	2143	25.7%
Spirit	704	9.4%	600	7.2%
United	391	5.2%	528	6.3%
US Airways	374	5.0%	544	6.5%
Virgin America	127	1.7%	199	2.4%
West Jet	12	0.2%	17	0.2%
Total(1)	7,480	100.0%	8,350	100.0%

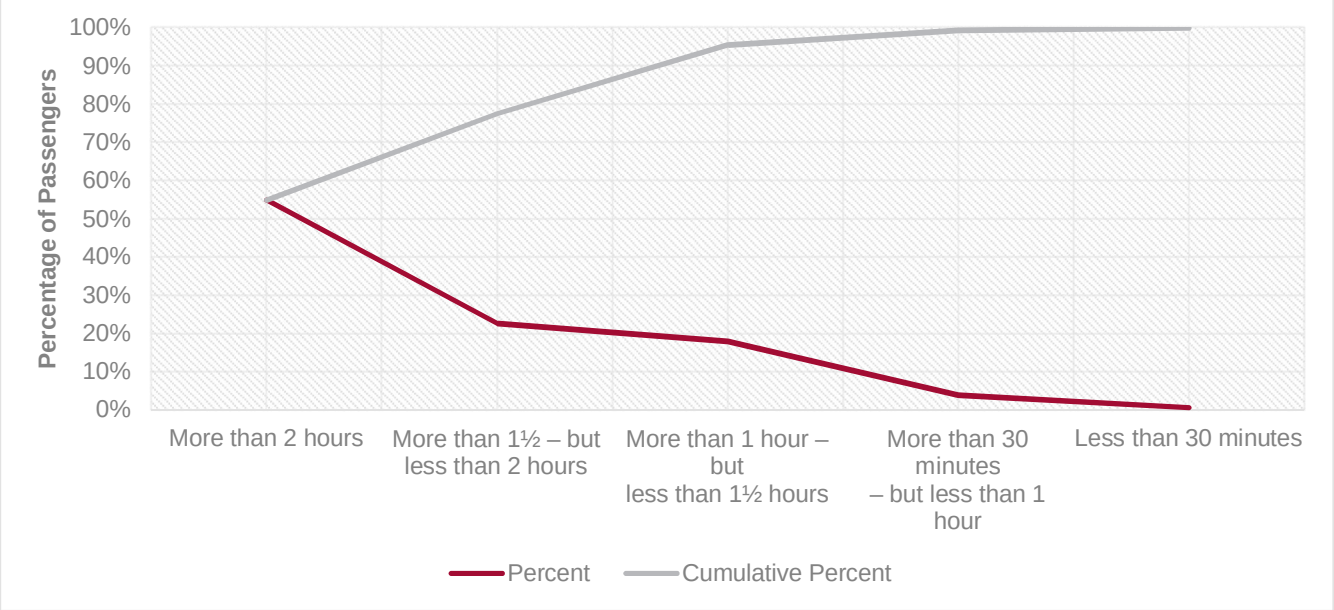
Notes: (1) Percentage totals may not total 100% due to rounding.

SOURCE: FLL Passenger Survey (2014)
PREPARED BY: Kimley-Horn and Associates, Inc.

TIME OF ARRIVAL

The time passengers arrive in advance of their flight time has an impact on the curbfront operations. These shifts are applied over a defined distribution either in advance of the time of enplaned flight departure, or after the time of deplaned flight arrival. The passenger survey collected information on the time, with respect to flight departure, that passengers arrived at the terminal building. The resulting time distribution curve for departing passengers is illustrated below in Figure 39.

Figure 39: Passenger Early Arrival Distribution Curve (to Terminal)

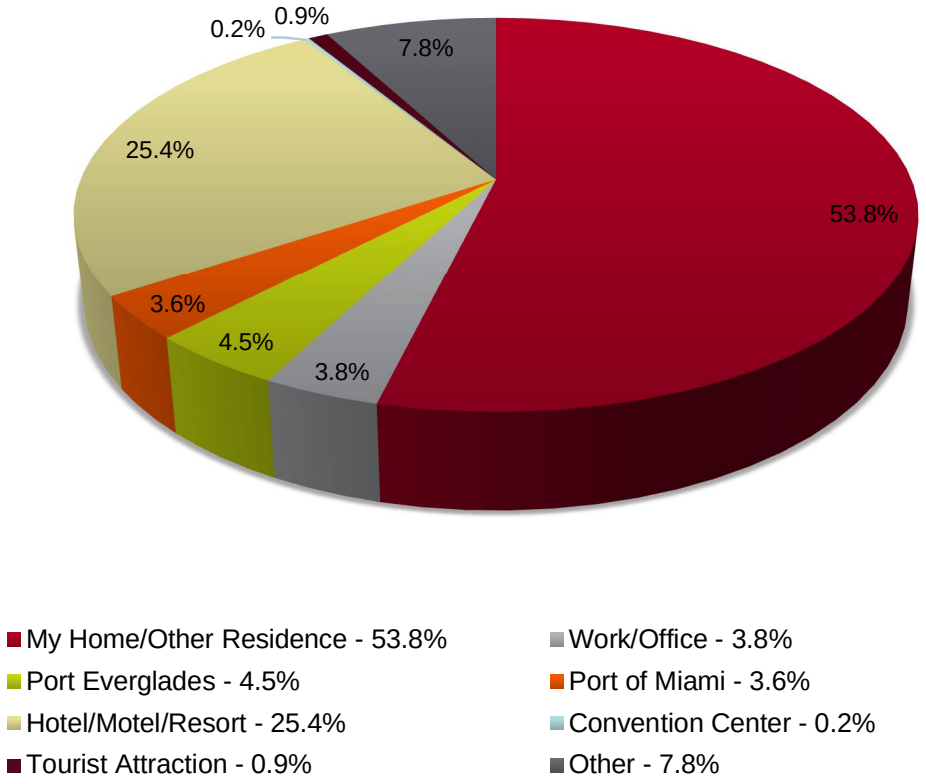


SOURCE: FLL Passenger Survey (2014)
PREPARED BY: Kimley-Horn and Associates, Inc.

TRIP PURPOSE

The passenger survey also collected information on the traveler origin prior to arriving at the airport. Figure 40 details the distribution of passenger trip purpose.

Figure 40: Trip Purpose Distribution

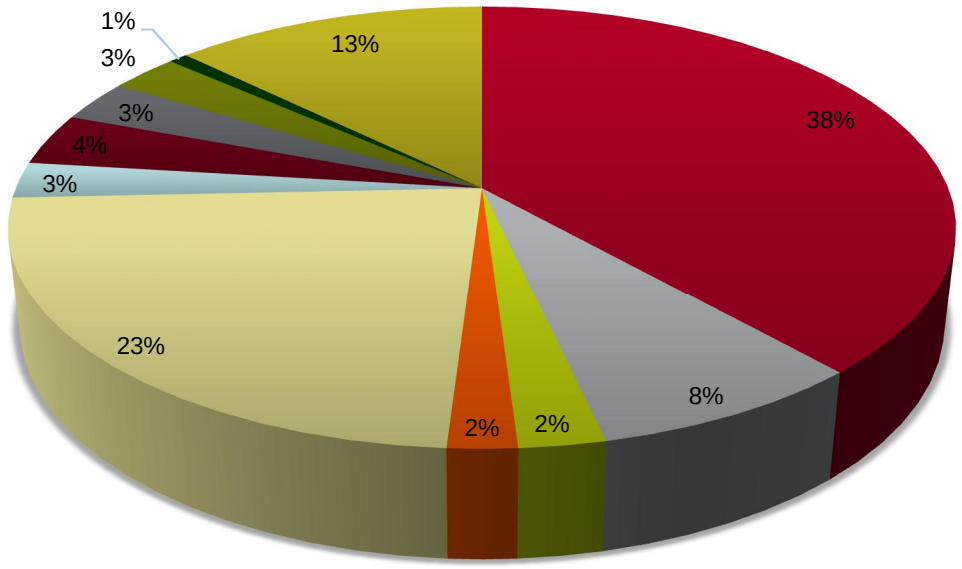


SOURCE: FLL Passenger Survey (2014)
PREPARED BY: Kimley-Horn and Associates, Inc.

MODE OF ARRIVAL

Passengers were asked several questions regarding their mode of arrival to the airport (e.g. private auto, rental car, taxi, limo, etc.). The majority of the passengers travel by private auto (e.g. personal/company car or rental car). The resulting percentage of passengers traveling by each mode is shown in Figure 41: .

Figure 41: Mode of Arrival Distribution



- Private Car-Dropped Off - 38%
- Private Car-Parked On-Airport - 8%
- Private Car-Parked in the Economy Lot - 3%
- Private Car-Parked in an Off-Airport Lot - 2%
- Rental Car - 23%
- Other - 3%
- Cruise Line Charter Bus/Shuttle - 4%
- Hotel/Resort Courtesy Vehicle - 3%
- Scheduled Airport Bus/Van - 3%
- Public Transportation - 1%
- Taxi/Limo - 13%

SOURCE: FLL Passenger Survey (2014)
PREPARED BY: Kimley-Horn and Associates, Inc.

3.0 CURBFRONT OPERATIONAL OBSERVATIONS

An extensive traffic data collection effort was completed on Thursday November 19, 2015. The landside data was collected in two major categories: roadway traffic counts and terminal curbfront observations. A preliminary, seven-day traffic count was conducted to determine the distribution of traffic (i.e. "peaking") through the week. Additionally, these preliminary roadway traffic counts were followed with two-day (Thursday November 19, 2015 and Friday November 20, 2015) traffic counts at 42 locations.

In addition to the traffic counts, a number of terminal curbfront observations were conducted. Curbfront operational observations were completed during two, four-hour periods associated with peak arrival and peak departure periods determined by the seven-day traffic counts. All curbfront observations were conducted on Thursday, November 19, 2015 at various locations. The terminal curbfront data includes:

- Vehicle Classification Counts
- Dwell Time Observations by Mode
- Vehicle Occupancy (i.e. people getting into/out of vehicles)
- Loading/Unloading dwell times for a variety of vehicle types, including but not limited to, private autos, taxis, service vehicles, buses and shared ride
- Enforcement of observed congestion
- Parking tram operations - system route, headways, passenger boarding/alighting

In addition, bi-directional pedestrian counts were conducted at five-minute intervals at three terminal locations during the morning four-hour peak departure period and, at three terminal locations during the evening four-hour peak arrival period. Data collected included bi-directional counts, per person luggage counts, general flow patterns, accumulation at five-minute intervals and observed congestion/conflict areas.

The key traffic data items are summarized in this section, but applicable data is also provided in the appendix. Some of the traffic data, such as vehicle occupancy and dwell times, will be used as model input; while other traffic data items, such as the daily traffic counts and parking lot activity, will be used in the model calibration process.

Preliminary seven-day traffic counts conducted at seven locations throughout the airport identified the peak periods for the arrivals level, departures level, and on-site parking facility. The automatic traffic counts (tube counts) were conducted along access roadways with traffic counters that record one-way and/or two-way traffic volumes at each location in 15-minute intervals over the data collection period. These seven-day traffic counts were conducted from Saturday, September 26, 2015 to Saturday, October 3, 2015 to determine the inbound and outbound peaking throughout the week. The seven-day traffic counts were collected at these key airport entries/exits:

- Upper Level Terminal Entry
- Lower Level Terminal Entry
- Upper Level Terminal Exit
- Lower Level Terminal Exit
- Parking Entry
- Parking Exit
- Rental Car Return Entry

The daily volumes at these key airport entry and exit points were totaled to capture a representation of the daily overall airport activity. This total was then compared between days of the week to identify the peak day of the week for targeted counts and observations.

Table 17 presents the preliminary daily volume comparisons for all locations of the seven-day traffic counts.

Table 17: Summary of Seven-Day Traffic Counts

Day (Date)	Count Location						
	Upper Level Terminal Entry	Lower Level Terminal Entry	Parking Entry	Rental Car Return	Upper Level Terminal Exit	Lower Level Terminal Exit	Parking Exit
Saturday (9/26)	12,942	9,619	7,887	4,424	12,699	18,265	6,523
Sunday (9/27)	16,082	10,143	8,094	5,926	15,793	19,223	6,677
Monday (9/28)	15,321	9,250	9,406	5,518	14,969	18,637	7,275
Tuesday (9/29)	12,439	8,103	8,632	4,218	12,236	16,137	6,576
Wednesday (9/30)	12,868	8,239	9,069	4,490	12,506	16,754	6,804
Thursday (10/01)	14,809	9,923	10,311	5,093	14,364	19,717	7,162
Friday (10/02)	14,552	10,850	10,906	5,341	14,176	20,903	7,362
Saturday (10/03)	12,388	9,776	8,045	4,228	12,043	18,056	7,085

SOURCE: Traffic Counts (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Based on the daily overall airport activity summarized in Table 17, the peak day of the week for each count location was determined using heat maps, provided in the appendix. The peak day for the week along with the corresponding peak two-hour period for each count location was identified and is presented in the table below.

Table 18: Absolute Two-Hour Peak Periods – Seven-Day Counts

Count Location	Peak Day	Peak Period
Upper Level Terminal Entry	Monday	5:00 AM - 7:00 AM
Lower Level Terminal Entry	Sunday	5:00 PM - 7:00 PM
Parking Entry	Monday	4:30 AM - 6:30 AM
Rental Car Return	Sunday	3:45 PM - 5:45 PM
Upper Level Terminal Exit	Monday	5:15 AM - 7:15 AM
Lower Level Terminal Exit	Sunday	5:15 PM - 7:15 PM
Parking Exit	Monday	12:30 PM - 2:30 PM

SOURCE: Traffic Counts (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

The Master Plan Update will focus on a peak month, average day. In an effort to capture an average day, we examined the second highest weekday for each location. With the exception of the Parking Entrance, the secondary peak for every location was Thursday. For comparison purposes, the volumes for both the overall peak and the Thursday peaks were compared and differences in the volumes did not exceed 16%. Based on this analysis, Thursdays was the focus of the on-airport data collection effort and the operational observations were

scheduled for November 19, 2015. Based on this analysis, the two-day counts were conducted on Thursday, November 19, 2015 and Friday, November 20, 2015.

Curbfront activity data was collected for two four-hour periods on Thursday, November 19, 2015 coinciding with first day of the consecutive 48-hour traffic count. The first four-hour period is designated the "peak departures (drop-off) period" and consists of the peak four hours of curbfront activity for the departures level determined from the preliminary traffic counts. The second four-hour period is designated the "peak arrivals (pickup) period" and consists of the peak four hours of curbfront activity for the arrivals level determined from the preliminary traffic counts. The survey periods were selected to maximize the number of observations collected on the upper level/departures (drop-off) and lower level/arrivals (pickup) curbfronts during the four-hour observation period.

In general, the airport entry and exit volumes begin to peak in the morning, remain relatively constant through late morning and early afternoon and experience the highest activity during the late afternoon, early evening. Furthermore, the upper level curbfronts experience the highest peaks in the early morning (4:00-8:00 AM) and the lower level curbfronts experience the highest peaks in the evening (4:00-8:00 PM). Based on the upper level curbfront volumes and the hourly parking exit volumes, the peak departures (drop-off) hour is 5:45-6:45 AM. Similarly, based on the lower level curbfront volumes and the hourly parking exit volumes, the peak arrivals (pickup) hour is 5:45-6:45 PM.

The 42 count locations for the two-day consecutive counts are detailed in Table 19 and is divided by general area. The color blocking by location corresponds with the respective color designations in Figure 42. The daily, departures (drop-off) peak hour, arrivals (pickup) peak hour, AM peak hour, PM peak hour volumes and their accompanying time period are presented for each of the 42 count location in Table 20 and Table 21. Finally, the "Peak %" represents the percentage of daily traffic that occurs within the respective peak hour.

Figures 46 – 54 display the volumes for the count locations for the upper level, lower level, and access roadway count locations. The count locations are labeled with color scaled labels based on the traffic volumes. Graphics were generated for the daily volumes, AM Peak Hour Volume, and PM Peak Hour Volume. Separate graphics were also generated for the access roadways, upper level curbfront, and lower level curbfront. The AM period is 4:00 AM – 8:00 AM coinciding with the upper level, departures peak period. The PM peak period is 4:00 PM – 8:00 PM coinciding with the lower level, arrivals peak period.

Table 19: Roadway Traffic Count Locations (42 Total Locations)

Count Location	Description
Terminal Curbfront, Upper Level	Color Reference in Following Figures=
A	Main Entry to Upper Level Terminal Roadway
B	Ramp up from Perimeter Road
C	Main Exit (after all curbfronts)
Terminal Curbfront, Lower Level	Color Reference in Following Figures=
D	Ramp split to parking main entry (not specific garage entry)
E	Main ramp down
F	Ramp from Perimeter Road (to taxi hold area)
G	Ramp from Perimeter Road (to lower level curbfront)
H	Recirculation Road between Terminal 1 & 2
I	Recirculation Road from Upper Level Rental Car Center
J	Commercial vehicle entry between Terminal 1 near Terminal 2
K	Commercial vehicle entry west of Terminal 2
L	Commercial vehicle curb west of Terminal 4 (currently under construction with T4 expansion)
M	Main parking exit east of Terminal 4
N	Commercial vehicle curb entry east of Terminal 4
O	Main exit east of Terminal 4
P	Parking Exit #1 (across from Perimeter Rd. Exit)
Q	Parking Exit #2 (Rental Car Helix/across from Perimeter Road Exit) merges with above location
Parking Entry/Exit	Color Reference in Following Figures=
R	Cell Phone Lot Entry
S	Cell Phone Lot Exit
Rental Cars Entry/Exit	Color Reference in Following Figures=
T	Return Entry
U	Bus Lane/Bypass
Terminal Area Roadways	Color Reference in Following Figures=
V	Exit to Perimeter Roadway (Traffic Circle)
W	Cell Phone Lot access from Perimeter Road
X	East Exit to Perimeter Road
Terminal Access Roadways	Color Reference in Following Figures=
AA	Southeast 6th Avenue to US1 Southbound
AB	US1 Northbound
AC	US1 Southbound
AD	US1 Southbound to Terminal
AE	I-595 Eastbound to Terminal
AF	I-595 Eastbound to US1 Southbound
AG	Northeast 7th Avenue Ramp
AH	I-595 Westbound Ramp
AI	I-595 Eastbound Ramp

AJ	US1 Northbound to I-595
AK	Terminal to I-595
AL	Terminal to US1 Northbound
AM	Terminal to Lower Road
AN	Terminal to Middle Road
AO	US1 Northbound to Terminal – North Lane
AP	US1 Northbound to Terminal – South Lane
AQ	Terminal Exit
AR	Terminal to Northeast 7th Avenue

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 42: Two-Day Count Locations

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 20: Thursday Peak Hour Roadway Traffic Count Volumes

Count Location	Thursday Daily Total	Departure Peak Hour (5:45 AM - 6:45 AM)		AM Peak Hour (Hour Varies Based on Location)			Arrival Peak Hour (5:45 PM - 6:45 PM)		PM Peak Hour (Hour Varies Based on Location)		
		Vehicle Count	% of Daily	AM Peak Hour	Vehicle Count	% of Daily	Vehicle Count	% of Daily	PM Peak Hour	Vehicle Count	% of Daily
A	16,142	1,097	6.8%	10:15-11:15	1,142	7.1%	824	5.1%	6:15-7:15	950	5.9%
B	1,844	70	3.8%	8:00-9:00	103	5.6%	125	6.8%	6:15-7:15	166	9.0%
C	18,501	1,210	6.5%	10:15-11:15	1,270	6.9%	968	5.2%	6:30-7:30	1,128	6.1%
D	10,574	657	6.2%	4:15-5:15	703	6.6%	422	4.0%	2:00-3:00	611	5.8%
E	12,971	309	2.4%	11:45-12:45	869	6.7%	730	5.6%	8:00-9:00	981	7.6%
F	3,294	108	3.3%	11:45-12:45	264	8.0%	242	7.3%	12:15-1:15	322	9.8%
G	2,861	69	2.4%	11:45-12:45	192	6.7%	163	5.7%	6:45-7:45	193	6.7%
H	5,637	373	6.6%	4:00-5:00	541	9.6%	146	2.6%	1:30-2:30	354	6.3%
I	1,781	58	3.3%	11:15-12:15	136	7.6%	116	6.5%	8:00-9:00	130	7.3%
J	1,536	3	0.2%	11:00-12:00	116	7.6%	123	8.0%	8:30-9:30	147	9.6%
K	1,778	53	3.0%	11:15-12:15	112	6.3%	99	5.6%	12:45-1:45	152	8.5%
L	1,007	46	4.6%	9:45-10:45	71	7.1%	41	4.1%	10:30-11:30	68	6.8%
M	6,160	157	2.5%	11:45-12:45	322	5.2%	429	7.0%	8:30-9:30	513	8.3%
N	596	23	3.9%	10:00-11:00	42	7.0%	40	6.7%	9:15-10:15	51	8.6%
O	19,261	431	2.2%	11:45-12:45	1,339	7.0%	1,154	6.0%	12:00-1:00	1,305	6.8%
P	2,925	31	1.1%	11:45-12:45	171	5.8%	195	6.7%	4:30-5:30	257	8.8%
Q	8,512	135	1.6%	11:45-12:45	641	7.5%	400	4.7%	12:30-1:30	743	8.7%
R	1,549	26	1.7%	11:15-12:15	133	8.6%	91	5.9%	2:00-3:00	111	7.2%
S	1,620	16	1.0%	11:30-12:30	142	8.8%	117	7.2%	2:30-3:30	134	8.3%
T	7,140	231	3.2%	11:45-12:45	510	7.1%	399	5.6%	3:15-4:15	607	8.5%
U	1,612	54	3.3%	9:15-10:15	106	6.6%	81	5.0%	3:00-4:00	92	5.7%
V	5,439	171	3.1%	11:30-12:30	381	7.0%	297	5.5%	4:15-5:15	369	6.8%
W	2,244	86	3.8%	11:30-12:30	173	7.7%	101	4.5%	1:00-2:00	160	7.1%
X	2,231	79	3.5%	11:00-12:00	137	6.1%	111	5.0%	6:30-7:30	138	6.2%
AA	1,216	21	1.7%	9:15-10:15	117	9.6%	62	5.1%	4:45-5:45	90	7.4%
AB	20,884	477	2.3%	7:45-8:45	1,428	6.8%	1,483	7.1%	4:00-5:00	1,835	8.8%

Count Location	Thursday Daily Total	Departure Peak Hour (5:45 AM - 6:45 AM)		AM Peak Hour (Hour Varies Based on Location)			Arrival Peak Hour (5:45 PM - 6:45 PM)		PM Peak Hour (Hour Varies Based on Location)		
		Vehicle Count	% of Daily	AM Peak Hour	Vehicle Count	% of Daily	Vehicle Count	% of Daily	PM Peak Hour	Vehicle Count	% of Daily
AC	17,192	258	1.5%	7:45-8:45	1,004	5.8%	1,536	8.9%	5:00-6:00	1,672	9.7%
AD	7,576	327	4.3%	9:30-10:30	544	7.2%	448	5.9%	3:30-4:30	468	6.2%
AE	24,927	823	3.3%	9:45-10:45	1,562	6.3%	1,605	6.4%	6:45-7:45	1,993	8.0%
AF	5,107	171	3.3%	7:00-8:00	427	8.4%	480	9.4%	6:00-7:00	486	9.5%
AG	789	24	3.0%	10:45-11:45	53	6.7%	49	6.2%	3:30-4:30	59	7.5%
AH	28,720	1,070	3.7%	11:45-12:45	1,729	6.0%	1,798	6.3%	4:15-5:15	2,018	7.0%
AI	845	37	4.4%	7:30-8:30	147	17.4%	22	2.6%	12:00-1:00	78	9.2%
AJ	3,135	86	2.7%	7:15-8:15	269	8.6%	211	6.7%	4:30-5:30	367	11.7%
AK	8,510	287	3.4%	9:45-10:45	550	6.5%	527	6.2%	12:00-1:00	569	6.7%
AL	29,341	1,041	3.5%	11:45-12:45	1,678	5.7%	1,610	5.5%	12:30-1:30	1,858	6.3%
AM	8,331	249	3.0%	11:30-12:30	553	6.6%	442	5.3%	8:00-9:00	601	7.2%
AN	1,817	52	2.9%	10:30-11:30	100	5.5%	95	5.2%	6:45-7:45	127	7.0%
AO	3,853	138	3.6%	11:45-12:45	257	6.7%	240	6.2%	4:30-5:30	281	7.3%
AP	2,558	132	5.2%	10:30-11:30	164	6.4%	134	5.2%	4:15-5:15	214	8.4%
AQ	37,247	1,293	3.5%	11:45-12:45	2,161	5.8%	2,088	5.6%	12:30-1:30	2,341	6.3%
AR	5,430	218	4.0%	11:45-12:45	347	6.4%	350	6.4%	1:45-2:45	371	6.8%

SOURCE: Traffic Counts (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 21: Friday Peak Hour Roadway Traffic Count Volumes

Count Location	Friday Daily Total	Departure Peak Hour (5:45 AM - 6:45 AM)		AM Peak Hour (Hour Varies Based on Location)			Arrival Peak Hour (5:45 PM - 6:45 PM)		PM Peak Hour (Hour Varies Based on Location)		
		Vehicle Count	% of Daily	AM Peak Hour	Vehicle Count	% of Daily	Vehicle Count	% of Daily	PM Peak Hour	Vehicle Count	% of Daily
A	17,608	1,279	7.3%	5:15-6:15	1,355	7.7%	940	5.3%	2:15-3:15	1,025	5.8%
B	1,879	75	4.0%	11:15-12:15	105	5.6%	123	6.5%	5:15-6:15	141	7.5%
C	20,177	1,434	7.1%	5:30-6:30	1,444	7.2%	1,104	5.5%	2:30-3:30	1,160	5.7%
D	11,128	698	6.3%	5:00-6:00	743	6.7%	531	4.8%	1:45-2:45	622	5.6%
E	14,564	384	2.6%	11:45-12:45	1,008	6.9%	881	6.0%	6:45-7:45	1,018	7.0%
F	3,719	67	1.8%	11:45-12:45	373	10.0%	295	7.9%	12:00-1:00	383	10.3%
G	2,894	69	2.4%	9:30-10:360	174	6.0%	172	5.9%	6:30-7:30	178	6.2%
H	5,393	381	7.1%	3:30-4:30	547	10.1%	146	2.7%	2:15-3:15	320	5.9%
I	1,728	72	4.2%	11:15-12:15	115	6.7%	129	7.5%	5:30-6:30	133	7.7%
J	1,531	1	0.1%	11:45-12:45	138	9.0%	99	6.5%	12:00-1:00	174	11.4%
K	1,960	45	2.3%	11:45-12:45	110	5.6%	105	5.4%	8:45-9:45	138	7.0%
L	972	49	5.0%	9:30-10:30	60	6.2%	59	6.1%	11:00-12:00	69	7.1%
M	6,578	189	2.9%	11:45-12:45	385	5.9%	453	6.9%	5:00-6:00	464	7.1%
N	612	32	5.2%	6:00-7:00	36	5.9%	47	7.7%	6:45-7:45	51	8.3%
O	19,645	0	0.0%	11:45-12:45	1,467	7.5%	1,295	6.6%	12:00-1:00	1,491	7.6%
P	2,939	36	1.2%	11:45-12:45	208	7.1%	176	6.0%	2:45-3:45	255	8.7%
Q	8,678	146	1.7%	11:45-12:45	593	6.8%	428	4.9%	12:30-1:30	741	8.5%
R	1,587	24	1.5%	10:45-11:45	119	7.5%	102	6.4%	1:15-2:15	117	7.4%
S	1,578	22	1.4%	11:30-12:30	110	7.0%	115	7.3%	2:00-3:00	140	8.9%
T	7,390	295	4.0%	10:30-11:30	549	7.4%	409	5.5%	2:30-3:30	628	8.5%
U	1,723	73	4.2%	9:15-10:15	117	6.8%	78	4.5%	6:45-7:45	106	6.2%
V	5,564	202	3.6%	10:00-11:00	392	7.0%	318	5.7%	3:00-4:00	358	6.4%
W	2,172	81	3.7%	9:30-10:30	141	6.5%	97	4.5%	1:15-2:15	169	7.8%
X	2,309	92	4.0%	8:45-9:45	137	5.9%	145	6.3%	5:00-6:00	150	6.5%
AA	1,541	21	1.4%	9:00-10:00	112	7.3%	73	4.7%	1:45-2:45	147	9.5%
AB	23,320	652	2.8%	8:00-9:00	1,496	6.4%	1,690	7.2%	5:15-6:15	1,713	7.3%

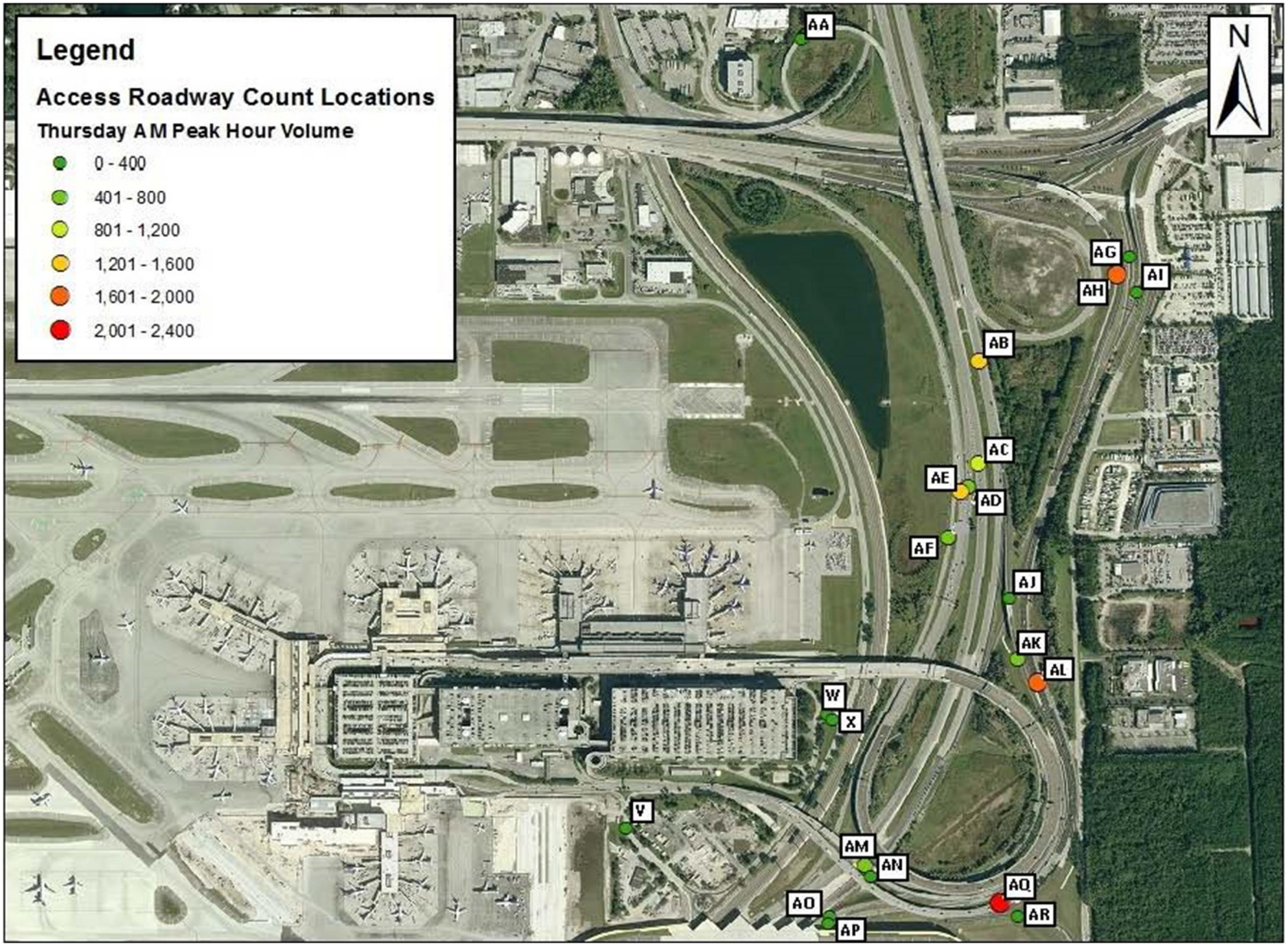
Count Location	Friday Daily Total	Departure Peak Hour (5:45 AM - 6:45 AM)		AM Peak Hour (Hour Varies Based on Location)			Arrival Peak Hour (5:45 PM - 6:45 PM)		PM Peak Hour (Hour Varies Based on Location)		
		Vehicle Count	% of Daily	AM Peak Hour	Vehicle Count	% of Daily	Vehicle Count	% of Daily	PM Peak Hour	Vehicle Count	% of Daily
AC	18,253	230	1.3%	8:15-9:15	1,049	5.7%	1,415	7.8%	4:45-5:45	1,701	9.3%
AD	8,745	380	4.3%	9:45-10:45	662	7.6%	498	5.7%	2:00-3:00	532	6.1%
AE	37,948	2,394	6.3%	5:15-6:15	2,590	6.8%	1,982	5.2%	2:15-3:15	2,240	5.9%
AF	5,491	174	3.2%	8:00-9:00	523	9.5%	578	10.5%	5:45-6:45	578	10.5%
AG	1,375	43	3.1%	7:45-8:45	208	15.1%	38	2.8%	10:45-11:45	136	9.9%
AH	33,377	1,300	3.9%	11:45-12:45	1,756	5.3%	1,999	6.0%	2:30-3:30	2,164	6.5%
AI	1,018	56	5.5%	11:30-12:30	127	12.5%	22	2.2%	12:00-1:00	121	11.9%
AJ	3,385	104	3.1%	7:15-8:15	322	9.5%	249	7.4%	4:15-5:15	318	9.4%
AK	9,417	329	3.5%	10:15-11:15	598	6.4%	640	6.8%	2:30-3:30	678	7.2%
AL	31,987	329	4.0%	11:45-12:45	1,776	5.6%	1,784	5.6%	2:30-3:30	2,036	6.4%
AM	6,827	5	0.1%	9:30-10:30	477	7.0%	476	7.0%	2:00-3:00	592	8.7%
AM	2,055	75	3.6%	11:30-12:30	115	5.6%	139	6.8%	5:15-6:15	143	7.0%
AO	4,048	124	3.1%	9:00-10:00	244	6.0%	258	6.4%	5:00-6:00	291	7.2%
AP	2,436	147	6.0%	5:15-6:15	167	6.9%	172	7.1%	5:30-6:30	181	7.4%
AQ	40,060	1,555	3.9%	11:45-12:45	2,239	5.6%	2,361	5.9%	2:30-3:30	2,586	6.5%
AR	5,598	208	3.7%	9:00-10:00	320	5.7%	334	6.0%	2:15-3:15	360	6.4%

SOURCE: Traffic Counts (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 43: Access Roadways, Daily Traffic Volume

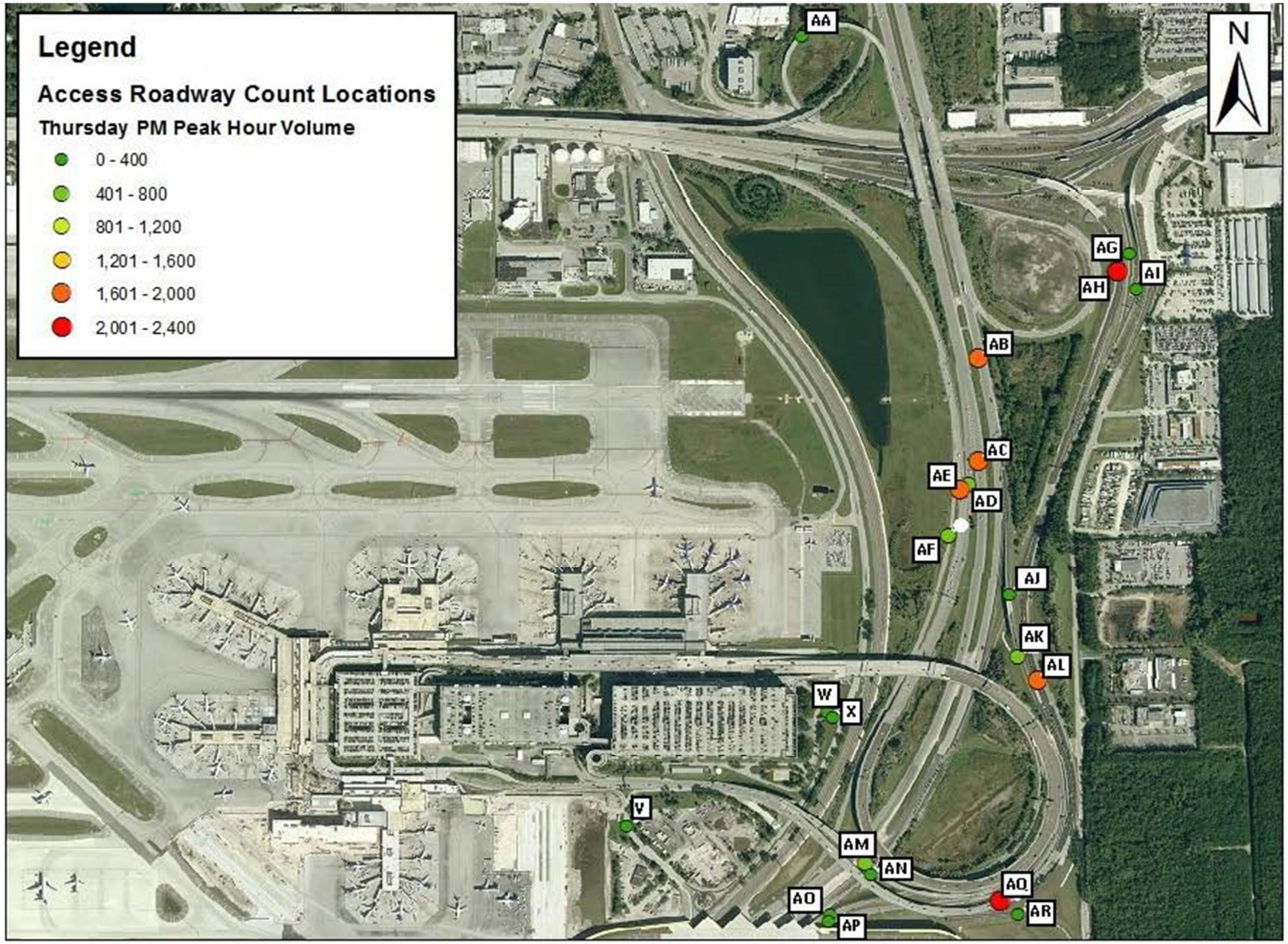
SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 44: Access Roadways, AM Peak Hour Traffic Volume



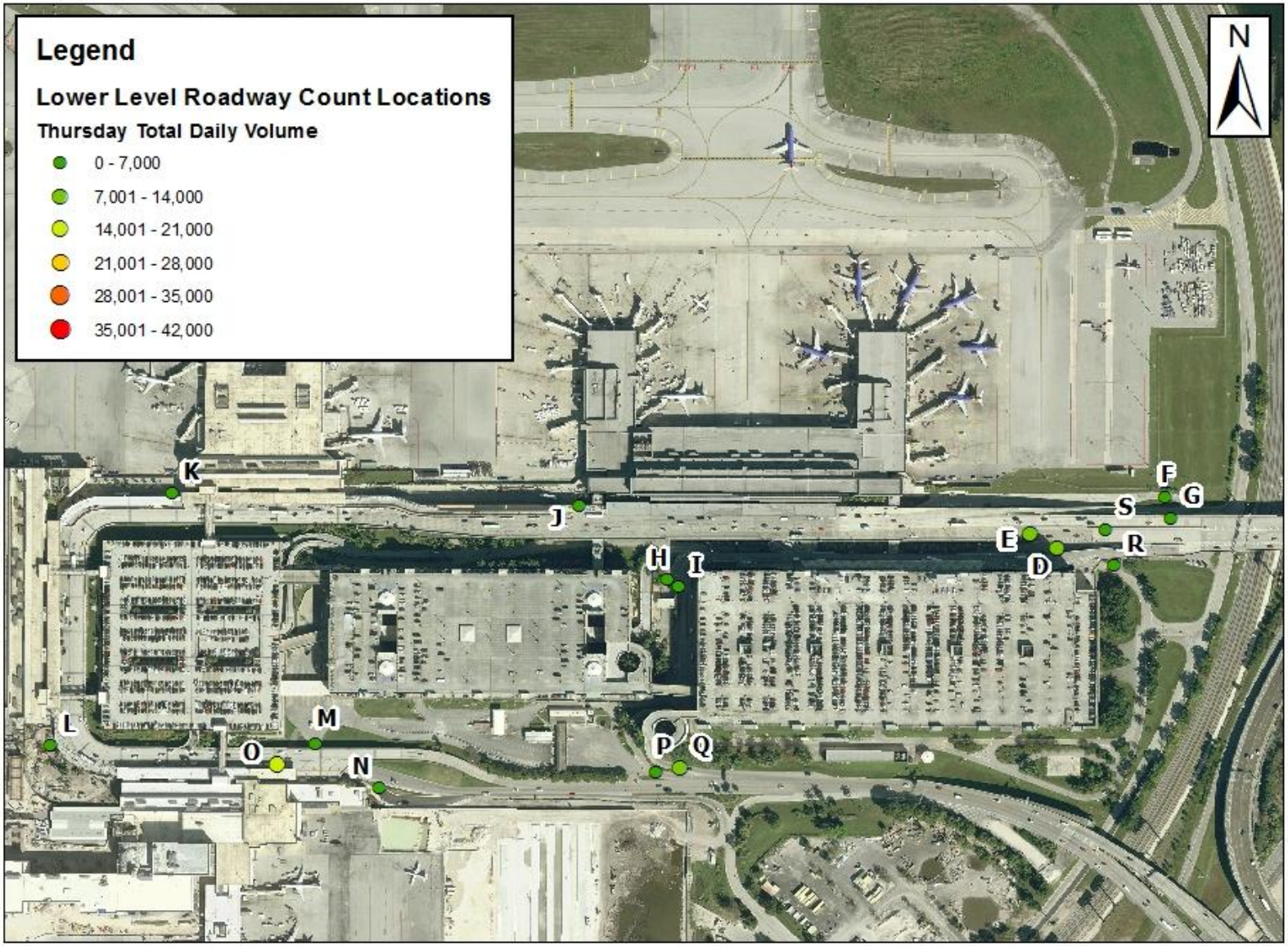
SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 45: Access Roadways, PM Peak Hour Traffic Volume



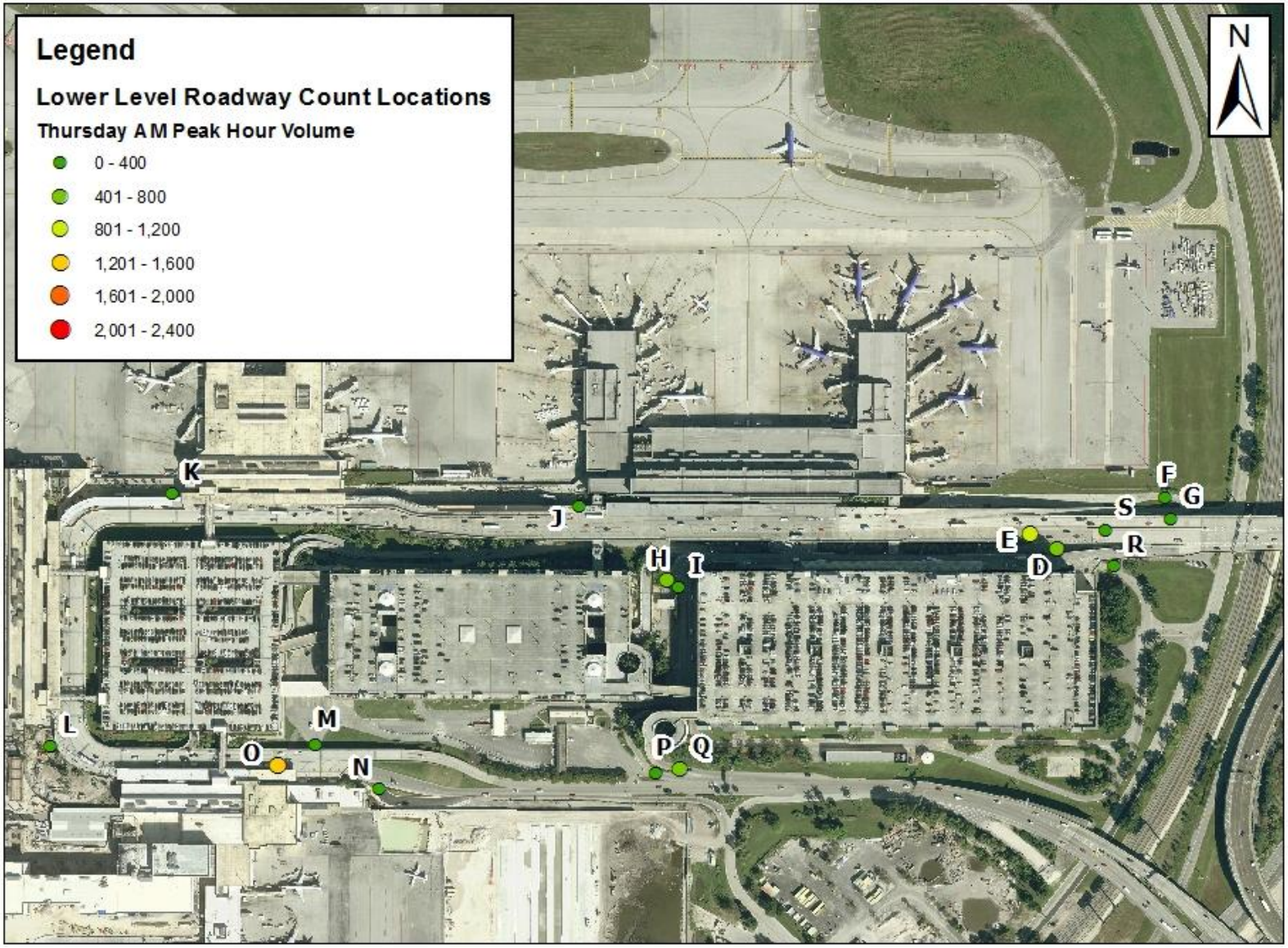
SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 46: Lower Level (Arrivals), Daily Traffic Volume



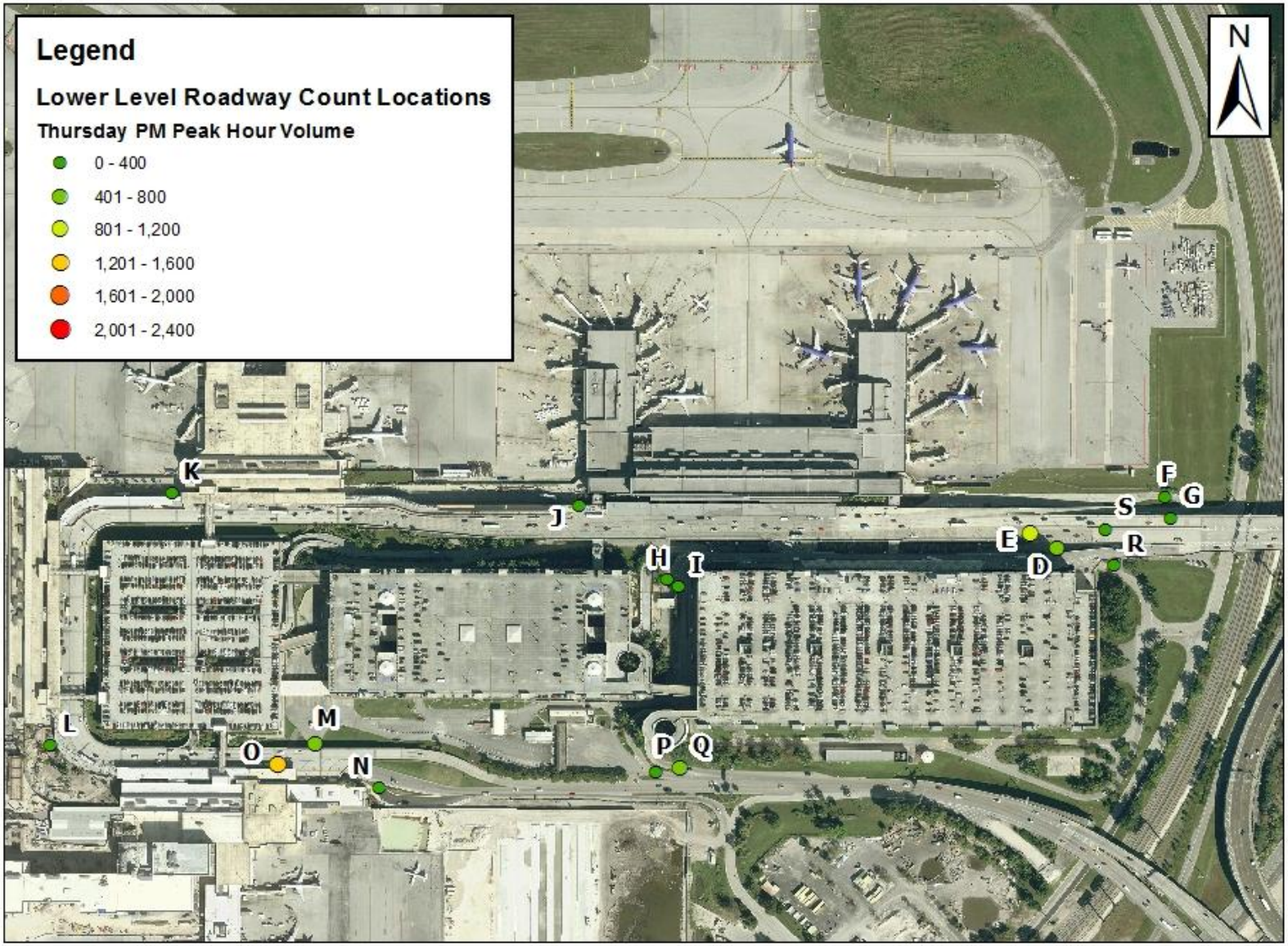
SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 47: Lower Level (Arrivals), AM Peak Hour Traffic Volume



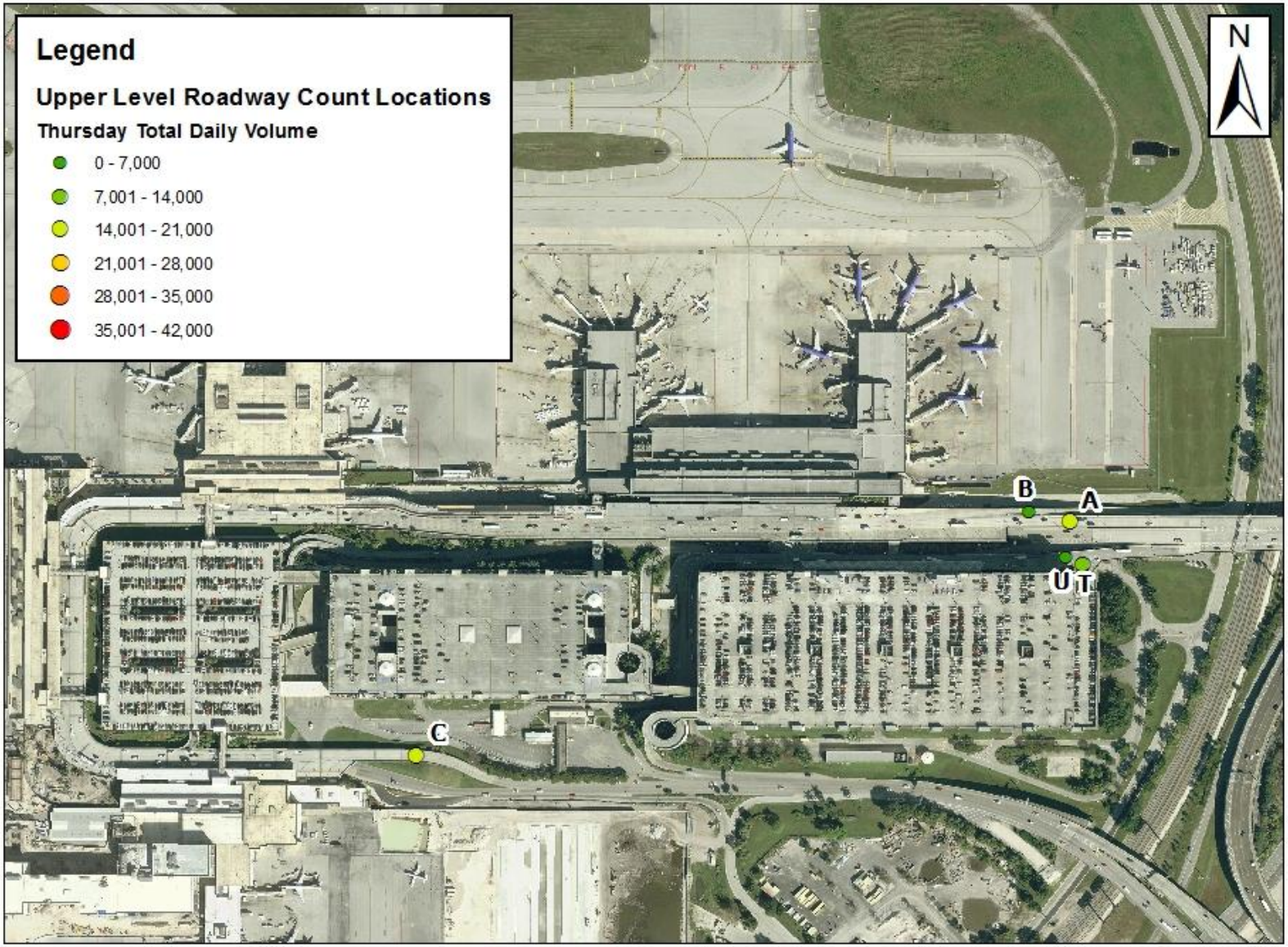
SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 48: Lower Level (Arrivals), PM Peak Hour Traffic Volume



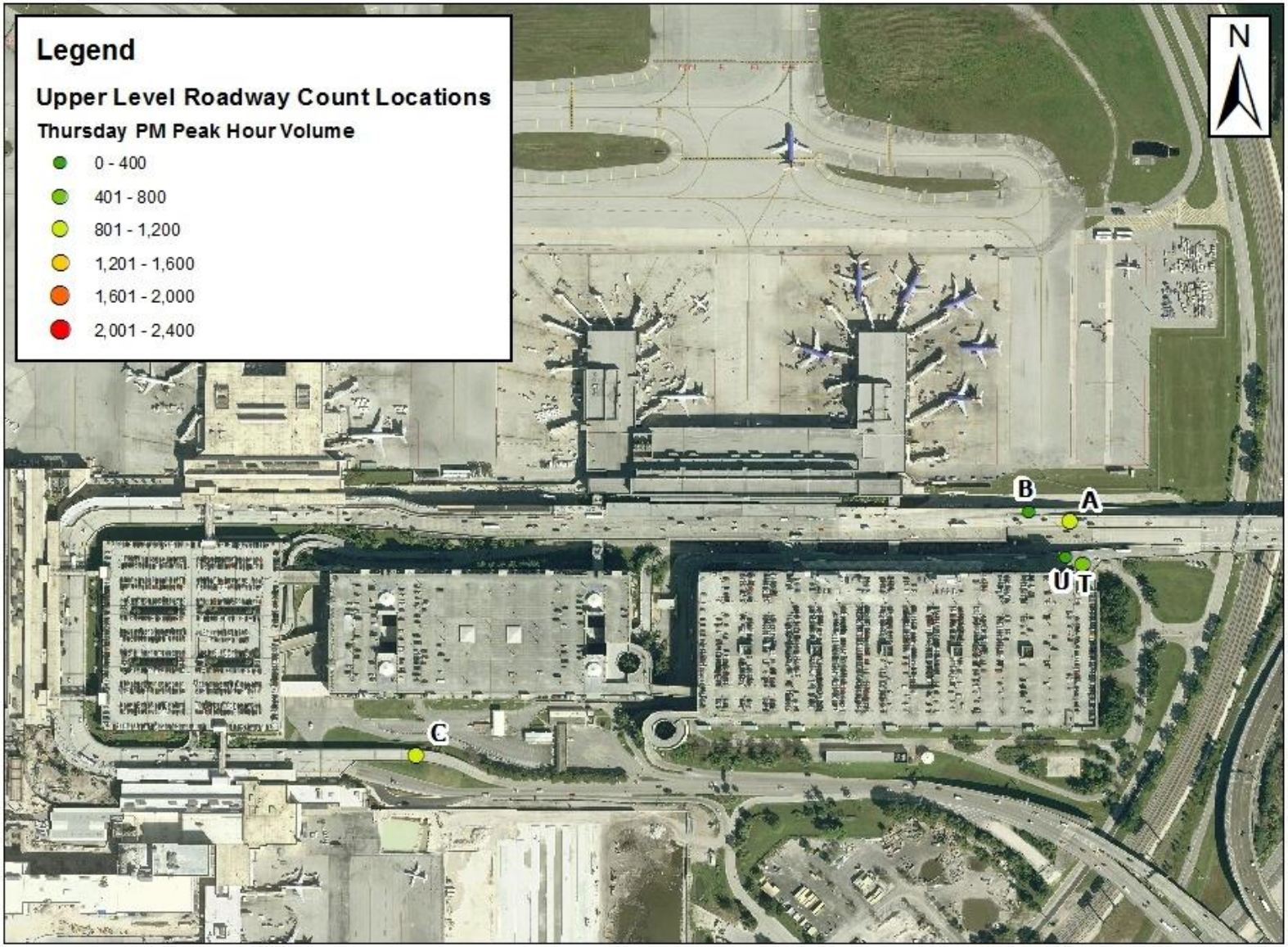
SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 49: Upper Level (Departures), Daily Traffic Volume



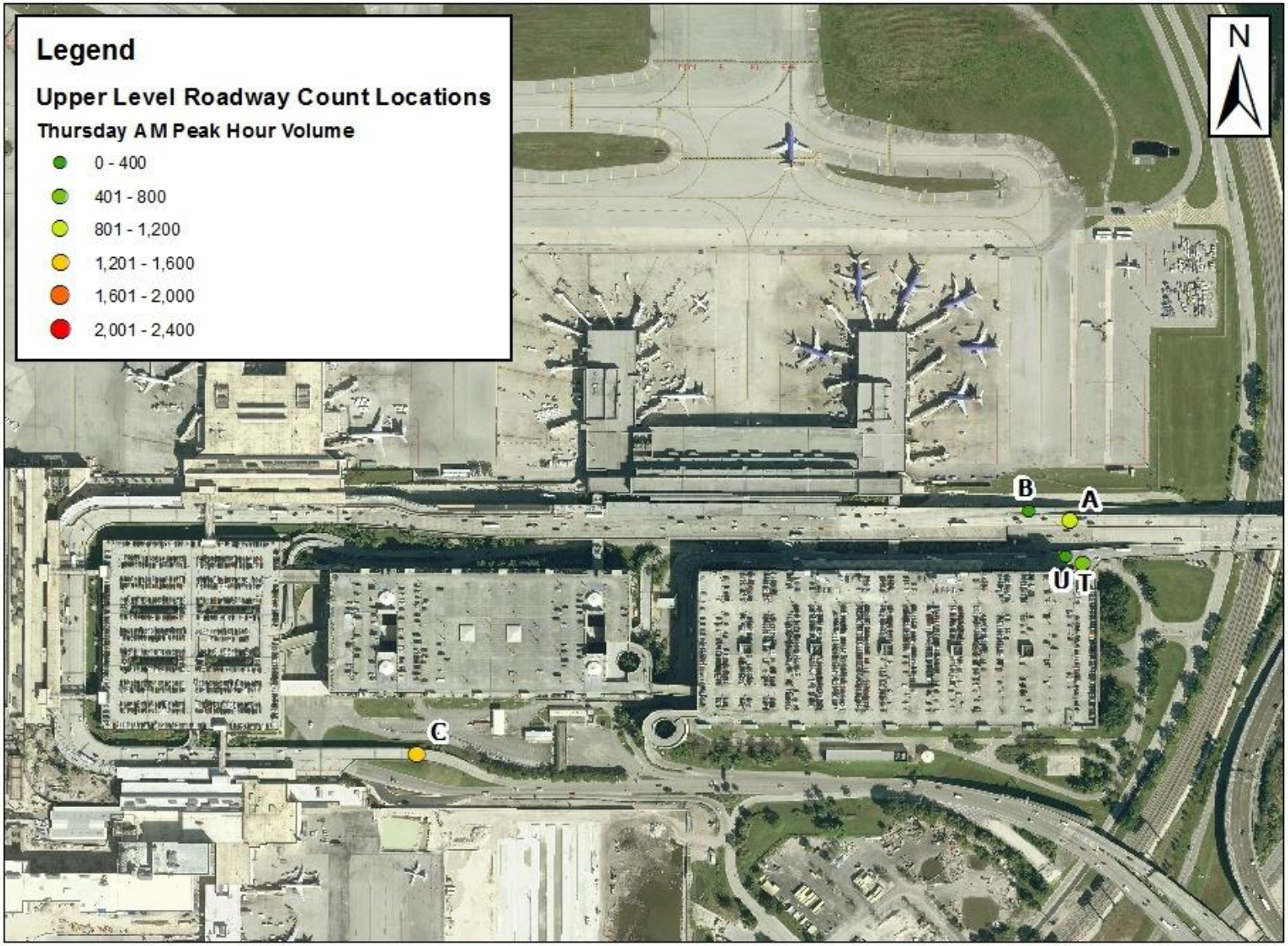
SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 50: Upper Level (Departures), AM Peak Hour Traffic Volume



SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 51: Upper Level (Departures), PM Peak Hour Traffic Volume



SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

3.2 CURBFRONT VEHICLE CLASSIFICATION COUNTS

Curbfronts provide access for a variety of travel modes including both commercial and private vehicles. The section below summarizes the travel modes that currently utilize the curbfront and the characteristics of the curbfront roadways. In an airport environment, vehicle mix (or vehicle classification) refers to the portion of the traffic volume accounted for by individual modes, as defined by both the type of service each mode provides (e.g., taxicab, courtesy vehicle, charter bus) and the type of vehicle used (e.g., sedan, passenger van, minibus, full-size bus). A number of different types of vehicles were identified as utilizing the curbfronts at FLL. The vehicle classification and dwell times take into consideration various vehicle types that frequented the airport during peak periods. Table 22 summarizes the documented vehicle types at FLL.

Table 22: Vehicle Classifications

Vehicle Type	Vehicle Example	Airport Utilization
Private Vehicles	Automobile, Pick-up Truck, SUV	Passenger Pick-Up and Drop-Off
Taxis	Taxi	Passenger Pick-Up and Drop-Off
Luxury Limo	Lincoln Town Cars & Expeditions	Passenger Pick-Up and Drop-Off
Buses	Public Bus, Remote Economy Lot Bus, Scheduled Bus, Charter & Tour Busses	Public Transit, Route 1 of the Broward County Transit & Tri-Rail service to Miami-Dade County, Broward County, and Palm Beach County. On-airport buses circulating between the RCC and GTAs.
Shuttles	Hotel & Motel Shuttles, Go Shuttles, Super Shuttles	Hotels and Off-Airport Parking Providers transport between parking lots and terminals.
Delivery Trucks	UPS, FedEx, Vendors	6:00 AM– 9:00 AM GTA-1 Upper/Lower Level, Gate 100 and Garages.
BCAD Vehicles	Broward County Trucks and Cars	Maintenance vehicles work at designated area at each terminal
Law Enforcement	Police, Ambulance, Airport Security	Recirculating (Orbiting) trips maintaining, and when needed directing, traffic flow
Transportation Network Companies (TNC) (e.g. Uber, Lyft, etc.)	Automobile, SUV	Passenger Pick-Up and Drop-Off

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

In addition to the traffic counts, vehicle classification counts were collected during both peak periods at the Terminal 1 entry. Due to the layout of the terminals, the terminal curbfronts and the roadway system, there are a number of vehicles that travel through the outside lanes of the curbfront with no intention of stopping. The counts recorded vehicles entering the airport by vehicle type (e.g., taxi, limo, bus, private auto, etc.) both from Terminal Drive and from Perimeter Road. The vehicle classification counts were conducted between 4:00 AM – 8:00 AM and 4:00 PM – 8:00 PM. The counts are summarized in 15-minute intervals and documented in the field data forms included in the appendix.

Table 23 and Table 24 summarize the total vehicle count by vehicle classification entering the airport. This total is further categorized by the four-hour peak period (arrival and departure), vehicle type, and finally by roadway entering the airport (Perimeter Road or Terminal Drive). Finally, "Percent Total Traffic" summarizes the traffic composition (in percent) by vehicle type during the four-hour peak period.

VEHICLE CLASSIFICATIONS

Taxis

Passengers may only be loaded in designated taxicab dispatch areas designated on the Lower Level Terminal Curbs or GTAs. Passenger loading outside of designated taxicab loading areas or on the Upper Level is strictly prohibited. The taxi hold lot is currently on the northwest corner of the airport. Taxi cabs are dispatched from this location and then stage in GTA-0 before being pushed forward to a respective terminal. AVI data provided by BCAD registered over 740,000 taxi trips over a one year period (April 2015 – March 2016).

Public Bus

Broward County Transit Route 1 is the only county bus with a route stop on the airport. The designated stop for BCT Route 1, Stop 7, is located adjacent to the stops for the on-airport shuttles at the Rental Car Center. The bus enters through the main airport entrance and exits through the ramp between Cypress and Hibiscus leading directly to Perimeter Road.

Economy Lot

The Economy Lot shuttle busses travelers from the off-airport site to various stop locations throughout the arrival level of the airport. Stops for the economy lot shuttle are lot just prior to the GTA of each terminal.

Airport Bus

Identical in appearance to both the public bus and economy lot shuttle, the on-airport shuttles provides travelers with access to the RCC. Each bus is dedicated to one or more terminals with the bus marquee notifying passengers which terminal the bus will stop at. The routes for theses buses include circulation throughout the airport, stopping at the Rental Car Center and its respective terminals.

After departing the Rental Car Center the bus will unload passengers that have just returned rental cars to the respective terminals on the departures level. Then circulating through the lower level, the buses will pick up arrival passengers and drop them off at the Rental Car Center. This shuttle service is not provided for Terminal 1 on the upper level, as a pedestrian bridge that connects the RCC to Terminal 1 is available.

Hotel/Motel Shuttle

A number of hotels near FLL offer shuttle service to passengers free of charge. Pickup and drop off locations are located at the GTA of each terminal. Provided AVI data registers over 236,000 courtesy hotel shuttles in the given one year period.

GO Shuttle

GO Shuttle is the official airport transportation provider at FLL. GO offers shared ride shuttles, private vans, private SUVs, and charters that transports passengers between FLL and their destination. The GO shuttle is the only transportation provider that has exclusive curbside space complete with podium.

On-demand shared ride limousines, sedans and vans are permitted to load passengers in designated shared ride loading zones located on the Lower Level only. On demand vehicles are permitted to stage in designated GTAs and in their dedicated loading zones only. AVI data provided by BCAD records over 95,000 trips for the GO shuttle for the one year recorded period (April 2015 – March 2016)

Off-Airport Parking Shuttle

Parking providers at locations near the airport provide free shuttle service to customers. These parking shuttles are permitted to load passengers in the GTAs and are prohibited from picking up and dropping off passengers at the terminal curbside. Details about off airport parking providers are detailed in Section 2.5. Off-airport parking shuttles account for over 93,000 trips in the one year period.

Off-Airport Rental Car

The RCC Bus Stop #7 is designated for BCT Route 1 as well as off airport rental car shuttle buses. 62,000 off airport rental car shuttles trips occurred in the past year.

Private Transportation Vans

Prearranged transportation vehicles can range from limousines to vans. All private transportation vehicles are required to use the GTA or park in the designated areas on Level 1 of the parking garages. Drivers waiting for their passengers in the dedicated waiting areas may hold one 12” x 12” sign stating the name of the passenger and the transportation company.

Charter Bus

Charter buses typically for cruise passengers or tours have a designated bus passenger loading area on the upper level between Terminals 1 and 2.

Delivery Trucks

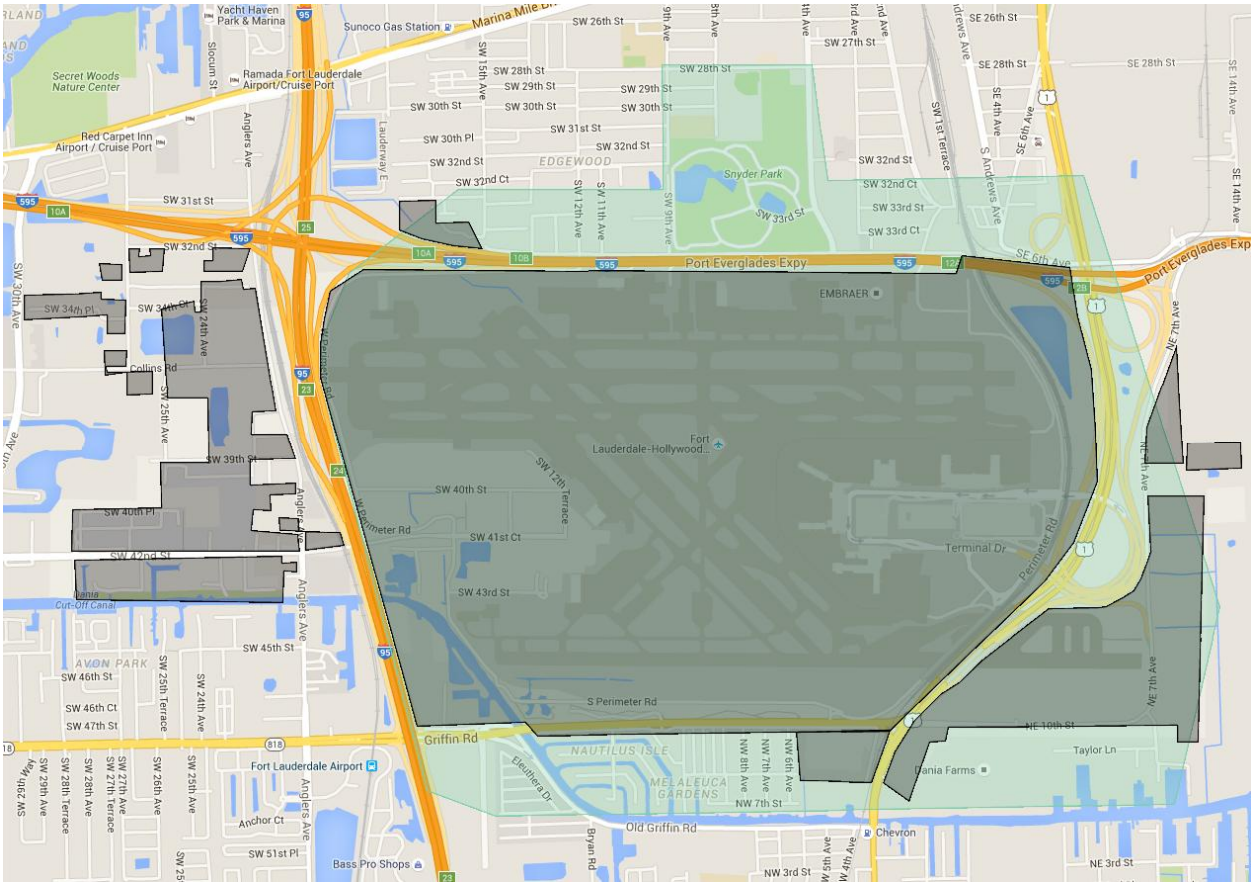
Curbside Delivery Vehicle Policy 1. 6:00a.m.-9:00a.m. GTA 1 Upper/Lower level. Vehicle must be attended at all times. 2. 6:00a.m.-9:00a.m. Gate 100 and Garages. 3. 24/7 GTA 4 upper level. Vehicle must be attended at all times. 4. All vehicles are subject to security inspection

Transportation Network Companies

Transportation network companies (TNC) operating at FLL include Uber and Lyft. At the time of the data collection, Uber was the only TNC in operation. Drivers are instructed to pick up passengers at the commercial vehicle areas only and not directly in front of the terminals unless dropping off on the upper level. All drivers were instructed to place a decal on the windshield to be readily identifiable to airport staff and customers.

A geozone was established which dictates that drivers will not receive any requests inside the official boundary of the airport property (areas shaded in grey in image below). The First-In First-Out geozone (area in green), allows drivers to hold in place in the virtual line and wait for another call. Once drivers leave the zone, their position in the line resets.

Figure 52: Uber Geozone



SOURCE: http://ubersouthflorida.com/broward/ (2016)
PREPARED BY: Uber

Table 23: Curbfront Vehicle Classification Counts – Upper Level (Departures) – AM Peak

Vehicle Classification	From Perimeter Road		From Terminal Drive		Total Curbfront	
	Volume	% of Total	Volume	% of Total	Volume	% of Total
Automobile, Pick-up, SUV	153	55.4%	2,882	83.7%	3,035	81.6%
Taxi	20	7.2%	325	9.4%	345	9.3%
Luxury Limousine	0	0.0%	3	0.1%	3	0.1%
Public Bus	0	0.0%	0	0.0%	0	0.0%
Remote Economy Lot Bus	0	0.0%	0	0.0%	0	0.0%
Airport Bus	0	0.0%	0	0.0%	0	0.0%
Hotel/Motel Shuttle	60	21.7%	15	0.4%	75	2.0%
Go Shuttle/Super Shuttle	0	0.0%	50	1.5%	50	1.3%
Off-Airport Parking Shuttle (Mini-Bus)	1	0.4%	49	1.4%	50	1.3%
Scheduled Bus	3	1.1%	1	0.0%	4	0.1%
Private Transportation Vans	16	5.8%	88	2.6%	104	2.8%
Delivery Trucks	2	0.7%	9	0.3%	11	0.3%
Law Enforcement Vehicle	13	4.7%	13	0.4%	26	0.7%
BCAD Trucks & Cars	6	2.2%	4	0.1%	10	0.3%
Charter & Tour Busses	1	0.4%	1	0.0%	2	0.1%
TNCs	1	0.4%	0	0.0%	1	0.0%
Other	0	0.0%	5	0.1%	5	0.1%
Total	276	100.0%(1)	3,445	100.0%(1)	3,721	100.0%(1)

Notes: (1) Percentage totals may not total exactly 100% due to rounding.

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 24: Curbfront Vehicle Classification Counts – Lower Level (Arrivals) – PM Peak

Vehicle Classification	From Perimeter Road		From Terminal Drive		Total Curbfront	
	Volume	% of Total	Volume	% of Total	Volume	% of Total
Automobile, Pick-up, SUV	789	75.9%	2,444	91.3%	3,233	87.0%
Taxi	11	1.1%	15	0.6%	26	0.7%
Luxury Limousine	1	0.1%	0	0.0%	1	0.0%
Public Bus	1	0.1%	0	0.0%	1	0.0%
Remote Economy Lot Bus	25	2.4%	0	0.0%	25	0.7%
Airport Bus	43	4.1%	51	1.9%	94	2.5%
Hotel/Motel Shuttle	77	7.4%	69	2.6%	146	3.9%
Go Shuttle/Super Shuttle	19	1.8%	10	0.4%	29	0.8%
Off-Airport Parking Shuttle (Mini-Bus)	32	3.1%	29	1.1%	61	1.6%
Scheduled Bus	3	0.3%	7	0.3%	10	0.3%
Private Transportation Vans	30	2.9%	37	1.4%	67	1.8%
Delivery Trucks	0	0.0%	0	0.0%	0	0.0%
Law Enforcement Vehicle	3	0.3%	4	0.1%	7	0.2%
BCAD Trucks & Cars	0	0.0%	2	0.1%	2	0.1%
Charter & Tour Busses	6	0.6%	3	0.1%	9	0.2%
TNCs	0	0.0%	0	0.0%	0	0.0%
Other	0	0.0%	5	0.2%	5	0.1%
Total	1,040	100.0%(1)	2,676	100.0%(1)	3,716	100.0%(1)

Notes: (1) Percentage totals may not total exactly 100% due to rounding.

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

3.3 LANE OCCUPANCY

Traffic patterns and flow at the airport are affected by the accessibility and usage of the curbfront lanes provided at each terminal. The lane occupancy, or number of vehicles occupying each lane, was observed as part of the curbfront data collection effort. The lanes were numbered from the curbfront outwards towards the traffic flow lane. During each 15-minute interval between 4:00-8:00 AM and 4:00-8:00 PM, a tally of the number of vehicles in each lane was conducted and documented. The field data form is included in the appendix.

Table 25: summarizes the documented field data between the arrival (4:00-8:00 AM) and departure (4:00-8:00 PM) peak periods for each of the four terminals. The total recorded occupancy during the four-hour peak period, the average occupancy per 15-minute interval, and the total percent occupancy per lane during the observation period at each terminal are represented in the table below.

Table 25: Terminal Lane Occupancy

Curbfront Location	Occupancy											
	Lane 1			Lane 2			Lane 3(1)			Traffic Flow Lane		
	Surveyed Vehicles (4-Hour)	Average	Observed % per Lane	Surveyed Vehicles (4-Hour)	Average	Observed % per Lane	Surveyed Vehicles (4-Hour)	Average	Observed % per Lane	Surveyed Vehicles (4-Hour)	Average	Observed % per Lane
AM Peak Period (Upper Level) Departures Peak Period												
Terminal 1	64	8.0	71.9%	25	3.1	28.1%	0.0	0.0	0.0%	0	0.0	0.0%
Terminal 2	12	2.4	46.2%	14	2.8	53.8%	-	-	-	0	0.0	0.0%
Terminal 3	61	6.0	51.7%	56	9.3	47.5%	-	-	-	1	0.2	0.8%
Terminal 4	36	6.0	50.7%	26	4.3	36.6%	-	-	-	9	1.5	12.7%
PM Peak Period (Lower Level) Arrivals Peak Period												
Terminal 1	151	12.6	57.0%	81	6.8	30.6%	22	1.8	8.3%	11	0.9	4.2%
Terminal 2	15	2.5	32.6%	10	1.7	21.7%	-	-	-	21	3.5	45.7%
Terminal 3	32	4.0	52.5%	29	3.6	47.5%	-	-	-	0	0.0	0.0%
Terminal 4	26	3.7	51.0%	25	3.6	49.0%	-	-	-	0	0.0	0.0%

Notes: (1) Only two curbfront lanes are available at Terminals 2, 3 and 4.

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

3.4 VEHICLE OCCUPANCY AND DWELL TIMES

The vehicle occupancy, or number of people occupying each vehicle, was also observed as part of the curbfront data collection effort. The vehicle occupancies were collected by vehicle type at each curbfront for a four-hour period. Similarly, the time that vehicles wait, or dwell, at the curbfront was also observed during the data collection effort. Similar to the vehicle occupancies, the dwell times were collected by vehicle type at each curbfront and differ for pickup and drop-off.

DWELL TIME

Dwell time is the amount of time a vehicle spends parked at a curbfront lane (or other passenger loading or unloading area). Typically, the dwell time is the length of time between when the driver parks (i.e., the vehicle comes to a complete stop) and when the driver first attempts to rejoin the traffic stream (it does not include any time during which the driver may be ready to depart, but is prevented from doing so by other vehicles). For some analyses, it is also helpful to measure "active" dwell times (i.e., the length of time a vehicle remains at a curbfront while actively loading/unloading passengers and their baggage) as opposed to the "total" dwell time, which reflects the time difference between when a vehicle first stops at a curbfront until it leaves the curbfront. Dwell time data is required to analyze curbfront roadway operations. The vehicle occupancies and dwell time were collected at all four terminals and further divided into the following three sections within their respective terminal; GTA, taxi staging area, and curbfront area. The vehicle occupancies and dwell times were also collected at the RCC. The average vehicle occupancies (including the driver) and dwell times by travel classification (drop-off and pickup), was conducted and documented in the field data forms included in the appendix.

The total passenger count (drop-off and pickup) and the average passenger count per vehicle for drop-off and pickup are presented in the tables below. Furthermore, the average vehicle occupancy, average dwell times (by vehicle type), taxi queue length (Taxi Staging Area only), and recorded lane usage are summarized in the following table(s):

- Table 26 Rental Car Center (Upper Level only, 4:00-8:00 AM)
- Table 27 and Table 28 Ground Transportation Areas (Lower Level only, 4:00-8:00 PM)
- Table 29 Taxi Staging Area (Lower Level only, 4:00-8:00 AM)
- Table 30 and Table 31 Curbfront Areas (4:00-8:00 AM and 4:00-8:00 PM)

Table 26: Vehicle Occupancy and Dwell Times – Rental Car Center (RCC) – AM Peak

Rental Car Center Curbfront	Passenger Activity			Average Vehicle Occupancy	Recorded Loading Time (min:sec)		
	Number of Vehicles Recorded	Average Passengers Dropped Off	Average Passengers Picked Up		Maximum	Average	Minimum
Rental Car Center Bus	54	3.7	11.1	12.1	6:23	2:32	0:35
Off-site Rental Company Shuttle	7	0.6	1.14	2.1	2:18	1:09	0:30

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 27: Vehicle Dwell Times – Ground Transportation Area (Lower Level) – PM Peak

Ground Transportation Area (Lower Level)	Average Dwell Time by Vehicle Classification (min:sec)(1)															
	Private Auto	Taxicab	Luxury Limousine	Public Bus	Economy Lot Bus	On-Airport Bus	Hotel/Motel Shuttle	Go Shuttle Super Shuttle	Off-Airport Parking Shuttle	Scheduled Bus	Private Transportation	Delivery Trucks	Law Enforcement	BCAD Trucks	Charter/Tour Bus	Uber
Terminal 1	1:26	-	-	-	1:16	0:57	1:14	0:00	0:37	-	-	-	-	0:45	-	2:00
Terminal 2	0:34	-	-	0:24	1:02	1:38	2:21	0:30	0:45	-	1:42	1:20	9:15	2:38	1:06	2:33
Terminal 3	-	-	-	-	1:26	2:42	0:40	-	0:21	-	3:23	-	-	-	2:20	-
Terminal 4	0:29	0:53	-	-	-	-	0:50	0:26	1:16	-	1:04	-	-	-	-	1:00

Notes: (1) A dash is displayed where dwell time observations were not recorded at the terminal for the specified vehicle classification

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 28: Vehicle Occupancy – Ground Transportation Area (Lower Level) – PM Peak

Ground Transportation Area	Recorded Passenger Drop-off	Average Passenger Drop-off (per vehicle)	Recorded Passenger Pickup (per vehicle)	Average Passenger Pickup (per vehicle)	Average Vehicle Occupancy	Lane Usage	
						Lane 1	Lane 2
Terminal 1	17	0.2	219	2.3	3.6	80.2%	19.8%
Terminal 2	39	0.5	377	4.7	7.3	97.1%	2.9%
Terminal 3	40	0.5	841	10.3	n/a	35.6%	64.4%
Terminal 4	13	0.3	88	2.0	4.7	100%	0.0%

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 29: Vehicle Occupancy and Dwell Times – Taxi Staging Area (Lower Level) – PM Peak

Taxi Staging Area (Lower Level)	Passenger Pickup		Average	
	Number of Vehicles	Average Passengers per Vehicle	Dwell Time (min:sec)(1)	Station Queue Length (Taxis)(2)
Terminal 1	304	1.8	0:56	15
Terminal 2	92	1.8	1:12	9
Terminal 3	95	1.7	0:53	4
Terminal 4	37	1.7	-	-

Notes: (1) A dash is displayed where dwell time observations were not recorded at the terminal for the specified vehicle type. (2) A dash is displayed where no queue was observed at the terminal for the taxi station.

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 30: Vehicle Occupancy – Curbfront Area, Upper Level (Departures) – AM Peak

Curbfront (Upper Level)	Passenger Drop-off		Average Dwell Time (min:sec)	Lane Usage per Lane(1)			
	Number of Vehicles	Average Passengers per Vehicle		Lane 1	Lane 2	Lane 3	Traffic Flow Lane
Terminal 1	330	1.3	1:34	72.8%	27.2%	0.0%	0.0%
Terminal 2	336	1.9	0:59	59.0%	29.8%	11.2%	0.0%
Terminal 3	649	3.5	1:29	42.7%	55.7%	1.6%	0.0%
Terminal 4	444	2.3	1:11	62.7%	36.8%	0.5%	0.0%

Notes: (1) Lane usage, specifically the lane parked, was captured as a part of dwell time observations. Minor differences may exist between data presented here and in Table 25: since they were two different observations.

SOURCE: Kimley-Horn and Associates, Inc. (2016)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 31: Average Occupancy – Curbfront, Upper Level (Departures) – AM Peak

Curbfront (Upper Level)	Average Occupancy by Vehicle Classification															
	Private Auto	Taxicab	Luxury Limousine	Public Bus	Economy Lot Bus	On-Airport Bus	Hotel/Motel Shuttle	Go Shuttle Super Shuttle	Off-Airport Parking Shuttle	Scheduled Bus	Private Transportation	Delivery Trucks	Law Enforcement	BCAD Trucks	Charter/Tour Bus	Uber
Terminal 1	2.2	2.5	2.6	-	3.3	-	3.2	2.0	4.0	-	2.3	-	-	-	2.0	2.1
Terminal 2	2.8	3.1	4.2	-	-	8.4	8.5	3.0	4.7	-	7.7	-	2.0	-	-	2.8
Terminal 3	3.0	3.6	2.7	17.0	3.6	11.5	4.0	2.0	3.4	17.0	6.3	-	-	-	3.5	-
Terminal 4	2.6	2.5	-	2.0	-	7.0	2.8	2.2	2.7	-	3.5	-	1.0	-	-	-

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 32: Vehicle Dwell Time – Curbfront Area, Upper Level (Departures) – AM Peak

Curbfront (Upper Level)	Average Dwell Time by Vehicle Classification (min:sec)(1)															
	Private Auto	Taxicab	Luxury Limousine	Public Bus	Economy Lot Bus	On-Airport Bus	Hotel/Motel Shuttle	Go Shuttle Super Shuttle	Off-Airport Parking Shuttle	Scheduled Bus	Private Transportation	Delivery Trucks	Law Enforcement	BCAD Trucks	Charter/Tour Bus	Uber
Terminal 1	1:43	1:07	1:41	-	0:50	-	1:24	0:49	1:20	-	1:25	-	-	-	4:01	1:00
Terminal 2	1:00	0:58	1:08	-	-	0:50	0:25	0:20	0:31	-	0:54	-	0:43	-	-	0:39
Terminal 3	1:40	1:24	1:16	1:32	2:07	1:42	1:17	1:31	0:45	1:10	1:02	-	-	-	1:15	-
Terminal 4	1:26	0:57	-	0:39	-	0:52	0:44	0:54	0:45	-	1:35	-	0:55	-	-	-

Notes: (1) A dash is displayed where dwell time observations were not recorded at the terminal for the specified vehicle type.

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 33: Vehicle Occupancy– Curbfront Area, Lower Level (Arrivals) – PM Peak

Curbfront (Lower Level)	Passenger Pickup		Average Dwell Time (min:sec)	Lane Usage(1)			
	Number of Vehicles	Average Passengers per Vehicle		Lane 1	Lane 2	Lane 3	Traffic Flow Lane
Terminal 1	289	1.6	2:23	51.1%	41.0%	7.3%	1.7%
Terminal 2	167	1.1	1:32	80.3%	16.3%	2.7%	0.7%
Terminal 3	336	0.8	1:06	56.2%	42.1%	1.3%	0.4%
Terminal 4	167	1.5	0:44	91.8%	7.3%	0.9%	0.0%

Notes: (1) Lane usage, specifically the lane parked, was captured as a part of dwell time observations. Minor differences may exist between data presented here and in Table 25: since they were two different observations.

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 34: Average Occupancy – Curbfront Area, Lower Level (Arrivals) – PM Peak

Curbfront Location (Lower Level)	Average Occupancy by Vehicle Classification															
	Private Auto	Taxicab	Luxury Limousine	Public Bus	Economy Lot Bus	On-Airport Bus	Hotel/Motel Shuttle	Go Shuttle Super Shuttle	Off-Airport Parking Shuttle	Scheduled Bus	Private Transportation	Delivery Trucks	Law Enforcement	BCAD Trucks	Charter/Tour Bus	Uber
Terminal 1	2.5	3.0	4.0	-	-	-	-	-	-	-	5.0	-	-	-	-	2.4
Terminal 2	2.4	3.0	2.7	-	-	-	-	-	-	-	3.0	-	-	-	-	3.0
Terminal 3	2.6	-	-	-	-	-	2.0	-	-	-	3.7	-	-	-	-	2.5
Terminal 4	2.9	3.3	3.0	-	-	-	4.0	3.0	-	-	-	-	-	-	-	2.0

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 35: Average Dwell Time by Vehicle Classification – Curbfront Area, Lower Level (Arrivals) – PM Peak

Curbfront Location (Lower Level)	Average Dwell Time by Vehicle Classification (min:sec)(1)															
	Private Auto	Taxicab	Luxury Limousine	Public Bus	Economy Lot Bus	On-Airport Bus	Hotel/Motel Shuttle	Go Shuttle Super Shuttle	Off-Airport Parking Shuttle	Scheduled Bus	Private Transportation	Delivery Trucks	Law Enforcement	BCAD Trucks	Charter/Tour Bus	Uber
Terminal 1	1:53	1:34	1:31	-	-	-	-	-	-	-	6:39	-	-	-	-	3:06
Terminal 2	1:29	0:42	1:19	-	-	-	-	-	-	-	0:52	-	-	-	-	1:05
Terminal 3	1:02	-	-	-	-	-	0:25	-	-	-	1:17	-	-	-	-	0:49
Terminal 4	0:57	0:42	0:45	-	-	-	0:56	2:09	-	-	-	-	-	-	-	0:33

Notes: (1) A dash is displayed where dwell time observations were not recorded at the terminal for the specified vehicle type.

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

3.5 PARKING TRAM OPERATIONS

As part of the passenger services at FLL, a parking tram operates on a daily basis through the parking garages. The tram loop consists of five designated pickup and drop-off locations which are located throughout the Hibiscus Parking Garage and Palm Parking Garage as shown on Figure 54 and Figure 55. During the four-hour peak arrival/departure periods, the tram arrival/departure times and the number of passengers entering/exiting the tram at each stop was documented. An example of the field data form is included in the appendix.

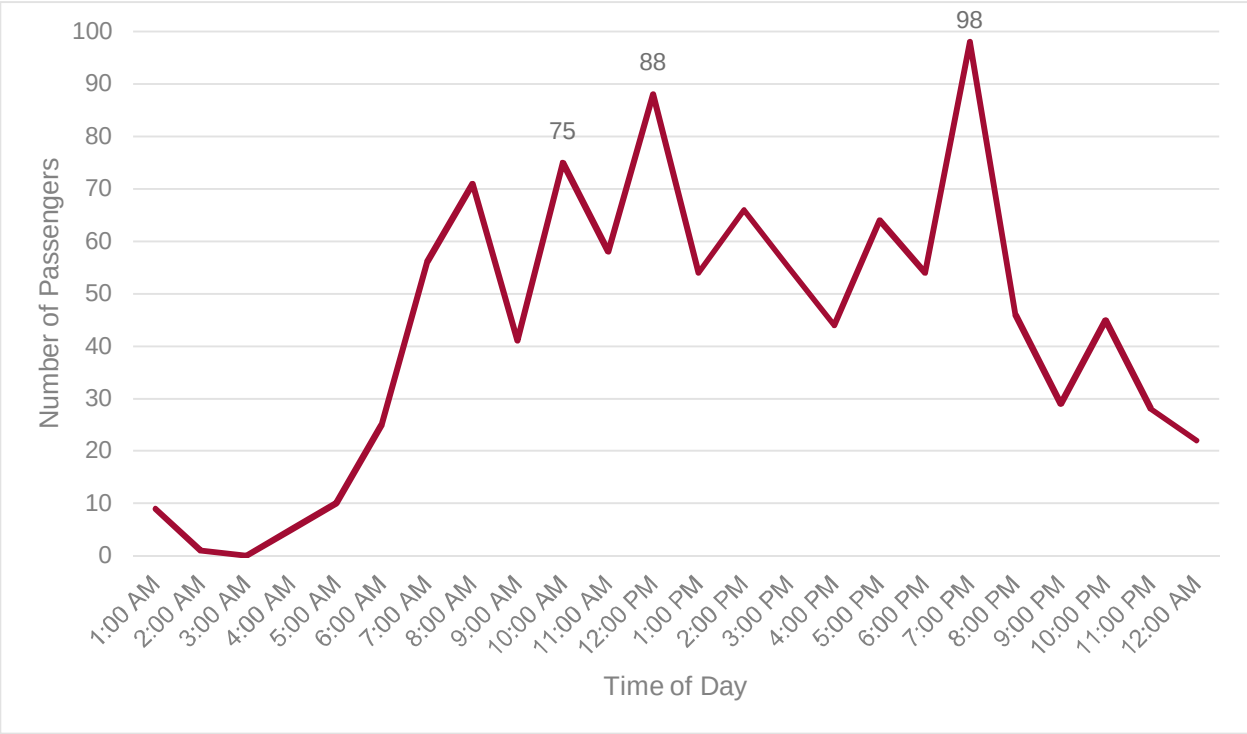
The ridership data including total passengers picked up on the parking tram is summarized in Table 36. The hourly distribution of passenger boarding for November 19, 2015 is shown in Figure 53. Nearly 10% of this day's passenger boarding occurred in the 6:00 PM – 7:00 PM time period. The four-hour period with the greatest number of boarding is 9:00 AM – 1:00 PM.

Table 36: Parking Tram Ridership Survey

Time Period	Passenger Count	Percent of Daily Ridership
12:00 AM – 1:00 AM	9	0.9%
1:00 AM – 2:00 AM	1	0.1%
2:00 AM – 3:00 AM	0	0.0%
3:00 AM – 4:00 AM	5	0.5%
4:00 AM – 5:00 AM	10	1.0%
5:00 AM – 6:00 AM	25	2.4%
6:00 AM – 7:00 AM	56	5.4%
7:00 AM – 8:00 AM	71	6.8%
8:00 AM – 9:00 AM	41	3.9%
9:00 AM – 10:00 AM	75	7.2%
10:00 AM – 11:00 AM	58	5.6%
11:00 AM – 12:00 PM	88	8.4%
12:00 PM – 1:00 PM	54	5.2%
1:00 PM – 2:00 PM	66	6.3%
2:00 PM – 3:00 PM	55	5.3%
3:00 PM – 4:00 PM	44	4.2%
4:00 PM – 5:00 PM	64	6.1%
5:00 PM – 6:00 PM	54	5.2%
6:00 PM – 7:00 PM	98	9.4%
7:00 PM – 8:00 PM	46	4.4%
8:00 PM – 9:00 PM	29	2.8%
9:00 PM – 10:00 PM	45	4.3%
10:00 PM – 11:00 PM	28	2.7%
11:00 PM – 12:00 AM	22	2.1%
Total	1,044	100%

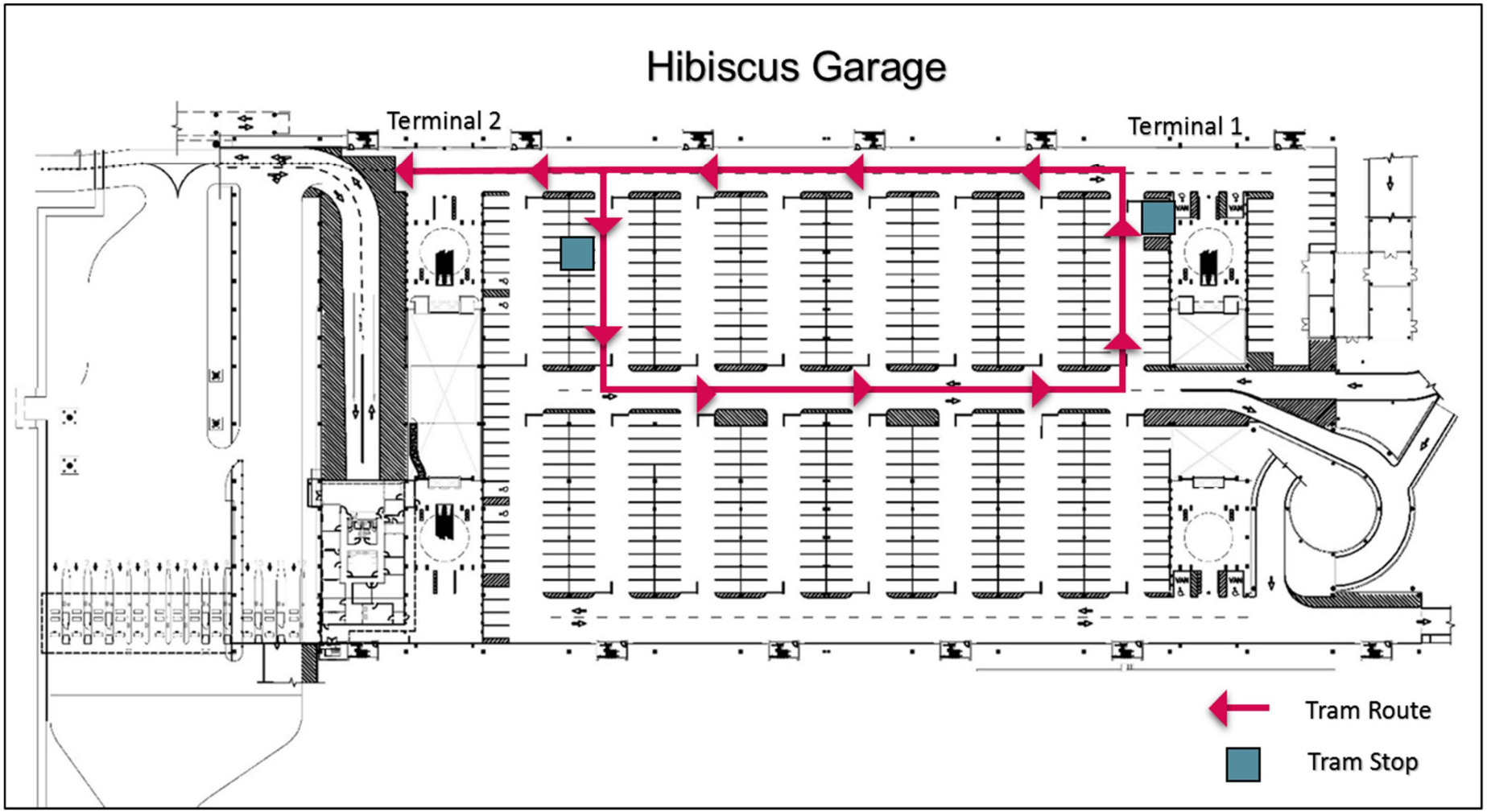
SOURCE: Broward County Aviation Department (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 53: Passenger Boarding Distribution – November 19, 2015



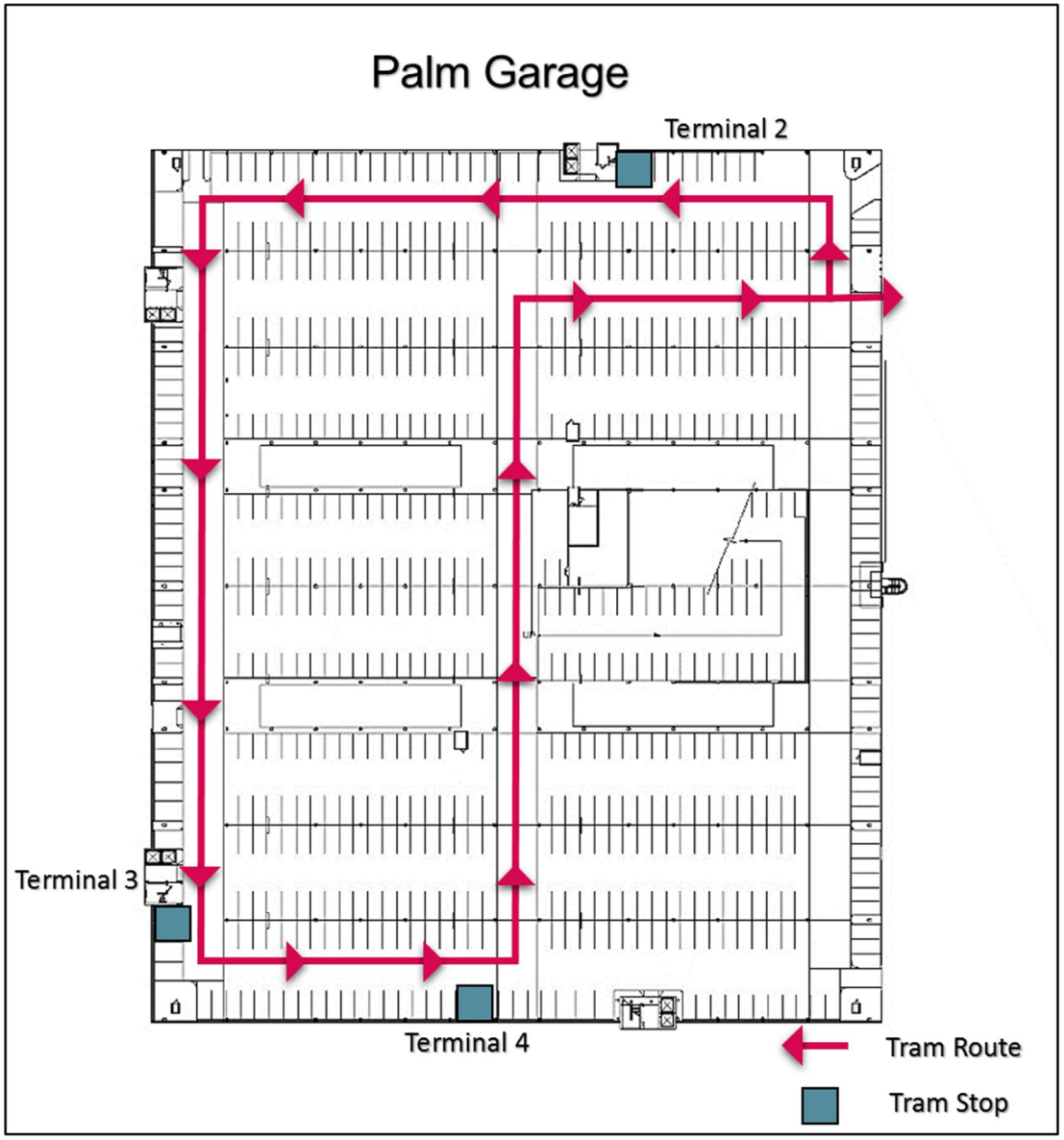
SOURCE: Broward County Aviation Department (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 54: Tram Designated Pick-up and Drop-off Locations (Hibiscus Parking Garage)



SOURCE: Broward County Aviation Department (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 55: Tram Designated Pick-up and Drop-off Locations (Palm Parking Garage)



SOURCE: Broward County Aviation Department (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

3.6 PEDESTRIAN OBSERVATIONS

Pedestrians accessing terminals have the options of bridges or crosswalks that connect to the parking garages. Passengers at the rental car center wishing to access the Terminal 1 can utilize the pedestrian bridge on the second level. There are no crosswalks at Terminal 1 and all pedestrian crossing are directed to the pedestrian bridges. Pedestrian crosswalks stemming from the Palm Garage are available to the upper level and lower levels of Terminals 2, 3, and 4. Pedestrian bridges are available above the upper level, but are currently under refurbishment.

Each terminal curbfront was observed for pedestrian activity as part of the onsite data collection activities performed in November 2015. Each curbfront was observed during the peak four-hour arrival/departure periods, in which, pedestrian data was collected at five-minute intervals. Pedestrian origination (airport or parking garage), pedestrian crossing usage, number of persons, baggage and vehicle reaction to the pedestrians are part of the data documented in the field fata forms. These forms are included within the appendix.

Total count of pedestrians, average group size, average amount of luggage, pedestrian origin (airport or parking garage), method of crossing (on crosswalk or jaywalking) and vehicle reaction are summarized in Table 37 and Table 38: . Finally, the peak and minimum pedestrian hour and their respective five-minute tallied average are also presented in the tables below.

Table 37: Pedestrian Observation Survey – Curbfront, Upper Level (Departures) – AM Peak Period

Upper Level Survey Observations	Terminal 2	Terminal 3 (South)	Terminal 3 (North)	Terminal 4
Pedestrian Observation				
Total Count of Pedestrians	157	153	220	270
Peak Pedestrian Hour	6:00 – 7:00 AM	6:00-7:00 AM	6:00-7:00 AM	5:00 – 6:00 AM
Min. Pedestrian Hour	4:00 – 5:00 AM	5:00-6:00 AM	4:00-5:00 AM	7:00 – 8:00 AM
Peak Pedestrian Count (5 mins)	3.6	4.8	6.4	6.4
Min. Pedestrian Count (5 mins)	2.8	1.3	2.6	4.3
Average Pedestrian Count (5 mins)	3.5	3.3	4.6	5.6
Average Group Size	1.3	1.2	1.5	1.4
Average Luggage (bags per person)	0.9	0.9	1.3	1.0
Pedestrian Origin				
Airport	18.5%	22.5%	22.4%	20.3%
Garage	81.5%	77.5%	77.6%	79.7%
Pedestrian Crossing Method				
On Crosswalk	96.8%	100.0%	99.3%	93.2%
Jaywalking	3.2%	0.0%	0.7%	6.8%
Vehicle Reaction				
Stopped	57.3%	62.8%	72.7%	67.2%
Did not Stop	20.4%	11.6%	6.3%	12.0%
Stopped Abruptly	3.2%	5.4%	7.0%	2.6%
No Traffic	19.1%	20.2%	14.0%	18.2%

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Table 38: Pedestrian Observation Survey – Curbfront, Lower Level (Arrivals) – PM Peak Period

Lower Level Survey Observations	Terminal 2	Terminal 3	Terminal 4
Pedestrian Observation			
Total Count of Pedestrians	591	428	877
Peak Pedestrian Hour	5:00 – 6:00 PM	5:00 – 6:00 PM	6:00 – 7:00 PM
Min. Pedestrian Hour	7:00 – 8:00 PM	6:00 – 7:00 PM	7:00 – 8:00 PM
Peak Pedestrian Count (per 5 mins)	18.5	9.6	28.3
Min. Pedestrian Count (per 5 mins)	5.7	7.2	5.6
Average Pedestrian Count (per 5 mins)	12.6	8.9	20.9
Average Group Size	1.8	2.8	2.0
Average Luggage (bags per person)	1.3	1.8	0.8
Pedestrian Origin			
Airport	57.1%	48.1%	52.7%
Garage	42.9%	51.9%	47.3%
Pedestrian Crossing Method			
On Crosswalk	98.5%	96.1%	98.6%
Jaywalking	1.5%	3.9%	1.4%
Vehicle Reaction			
Stopped	58.3%	66.3%	61.3%
Did not Stop	7.1%	1.3%	10.0%
Stopped Abruptly	24.5%	26.6%	21.1%
No Traffic	10.1%	5.8%	7.7%

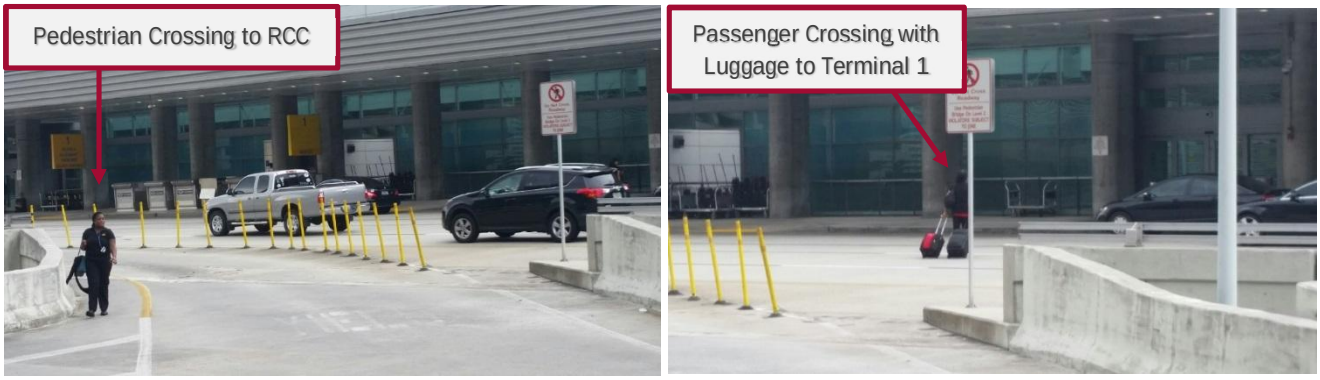
SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

4.0 GENERAL OBSERVATIONS

This section provides general observations captured at the airport during the field visits performed and during the data collection effort. The observations are in relation to the curbfront activity and will be discussed as it relates to each terminal. Photos will be used, if available, to further detail the observation.

One observation on the lower level of Terminal 1 was the lack of police vehicles and personnel to clear the curbs. Also in Terminal 1, pedestrians jaywalking were observed crossing from the RCC to the airport on the upper level. This crossing was noted to be very dangerous as it crosses through more than 6 travel lanes as depicted in Figure 56.

Figure 56: Pedestrians Jaywalking, Terminal 1, Upper Level (Departures)

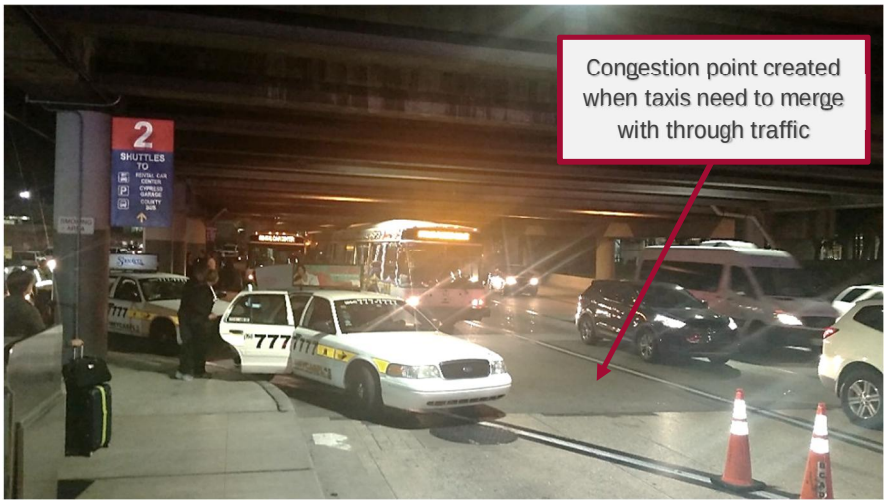


SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

In regards to Terminal 2, a sight distance issue was observed on the pedestrian crosswalks. It was apparent that the vehicles on the outer lanes were not able to see pedestrians at the opposite end (i.e. at the terminal) of the crosswalk if every lane had a vehicle stopping at the crosswalk. This issue may be attributed to the stop bar being too close to the crosswalk, blocking the visual angle from the vehicles to the end of the crosswalk by other vehicles on the travel lanes.

Another observation in Terminal 2 was regarding the congestion on the lower level (arrivals) at the taxi lane of GTA-1. Congestion was observed especially when taxis and shuttles want to exit GTA-1 into traffic at the same time as depicted in Figure 57.

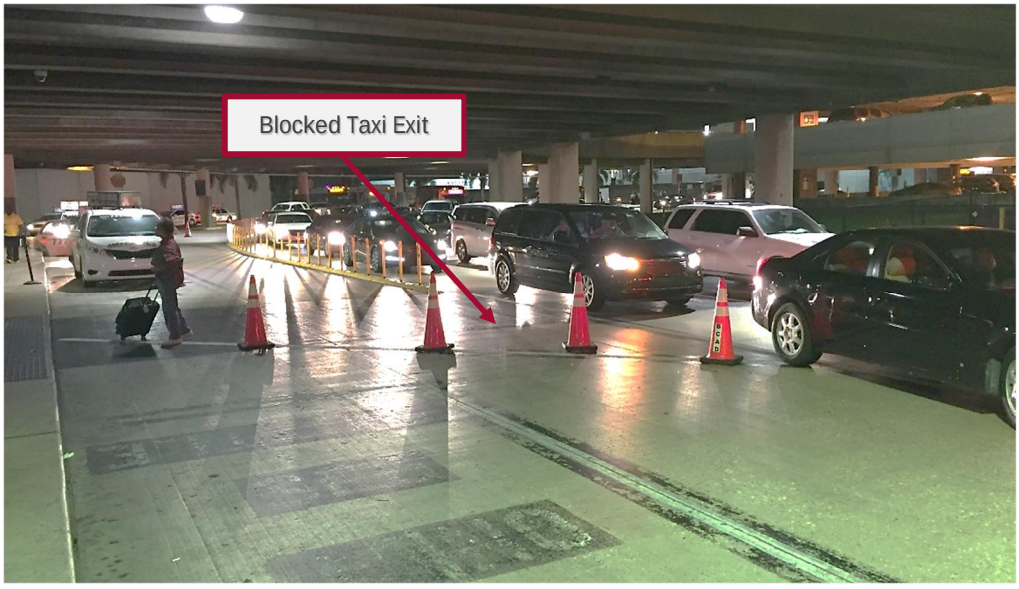
Figure 57: Taxi Congestion Point, GTA-1, Lower Level (Arrivals)



SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

One significant observation in Terminal 3 was at the taxi lane exiting GTA-2 on the lower level (arrivals). During the peak hours the vehicles on the travel lanes blocked the taxi lane exit creating a back-up in the taxi service and creating congestion when the taxis try to exit. Figure 58 shows this scenario. The exit is small and does not merge smoothly into the travel lanes.

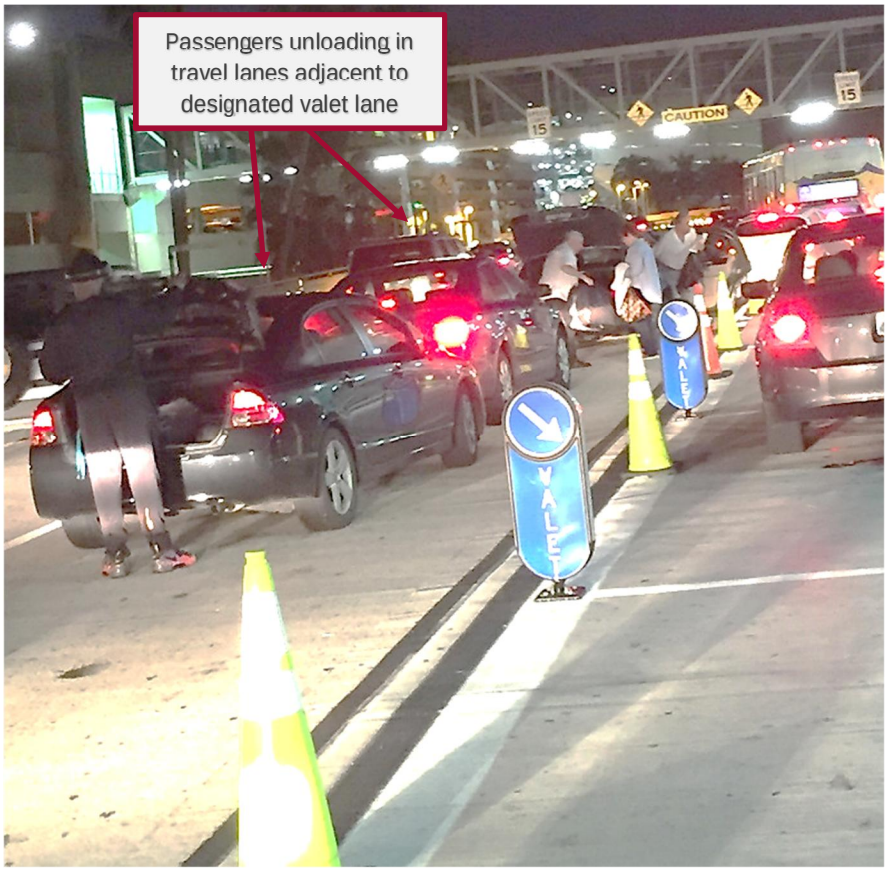
Figure 58: Blocked Taxi Exit, GTA-2, Lower Level (Arrivals)



SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Important observations were made at the Valet Parking located on the upper level (Departures) between Terminals 3 and 4 at GTA-3. Since the Valet Parking is located at the beginning of Terminal 4, immediately after the charter bus drop-off area, congestion occurred during the peak hours. Queues formed on the curved travel lane adjacent to the two valet lanes because of drivers stacking up at the first available private vehicle curbing lane at the beginning of Terminal 4 (right after valet). This caused drivers in the travel lane to be stuck and resulted in long periods of time where people dropped off passengers in the through lane. Resulting congestion is depicted in Figure 59. Also, the valet staff commented the valet spaces were too small and that sometimes queues extended into the flow lanes. The staff also mentioned the consolidated Terminal 3 and 4 locations at GTA-3 of the valet parking is always a complaint from the Terminal 3 customers. It is also important to note that drivers were observed missing the valet entrance and had to enter into the valet illegally between the cones/signs. The cause of this could be due to the valet signs not being big or high enough to be seen from far away in congested conditions (the valet signs are short and used as delineators for the valet entrance). No advance signage to alert drivers of the valet parking entry for congested conditions was observed.

Figure 59: Terminal 4 Valet Parking Congestion, GTA-3, Upper Level (Departures)



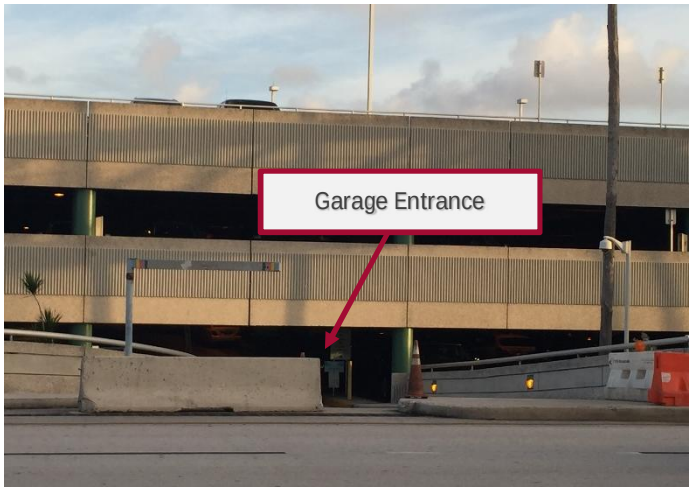
SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

A jaywalking problem was observed in Terminal 4, on the upper level (departures), approximately 20 feet away from the pedestrian crosswalk due to a blocked garage entrance where people enter from the garage area and then try to cross to the curbfront through the travel lanes. The blocked garage entrance is depicted in the figures below. It is important to note that there are clear signs prohibiting pedestrians from walking through that entrance as shown in Figure 60. The photo is shown from the garage's point of view.

Figure 60: Pedestrian Signs

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 61: Blocked Garage Entrance



SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Another observation on Terminal 4 was encountered at the pedestrian crosswalk (Figure 62) on the lower level (Arrivals) related to vehicle speed. Vehicles were noticed to accelerate given that they are about to exit the airport and vehicles frequently ignored pedestrians crossing because of their high speed. Very abrupt stops were observed at this crosswalk as noted previously in Table 38 and the testimony from a security guard confirmed this observation when he reported being hit by vehicles twice in a year at this crosswalk. No flashing lights, speed bumps, or law enforcement surveilling speed limits was noticed in this area.

Figure 62: Pedestrian Crosswalk on Terminal 4, Lower Level (Arrivals)

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Observations regarding lighting were also noted during the airport visits. Lighting was observed to be minimal at all the GTAs, except for the one at Terminal 3 GTA-3. Lighting in the lower levels was very poor even during daylight conditions. The lightbulbs seem to be located between ceiling beams causing a dimming effect as shown Figure 63. Lighting at the pedestrian crosswalks was not sufficient given the poor lighting conditions of the underground level. No flashing lights on the floor were noticed, only on the pedestrian sign. The lighting conditions were also noted in the *Signage and Wayfinding Master Plan*.

Figure 63: Lower Level Ceiling Lighting

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Observations regarding the Cell Phone lot identified the wayfinding signage was vague, non-visible and confusing. Also, it was observed that the cell-phone lot was too small and could not supply the capacity necessary for the demand. Figure 64 shows the cellphone lot wayfinding signage and Figure 65 shows the cell-phone lot at full capacity.

Figure 64: Cell-Phone Lot Wayfinding

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

Figure 65: Cell-Phone Lot Occupancy

SOURCE: Kimley-Horn and Associates, Inc. (2015)
PREPARED BY: Kimley-Horn and Associates, Inc.

5.0 NEXT STEPS

The summary inventory data collected and summarized in this report will be used to complete the Advanced Land Transportation Performance Simulation (ALPS) model of the existing landside operations. The roadway traffic counts and terminal curbfront counts collected during operational observations will be used to calibrate the simulation model. Once calibrated, the model will be used to establish the existing and future demand/capacity and facility requirements for FLL. Kimley-Horn will model the existing condition curbfronts, simulating passenger capacity and flow.

After completing and calibrating the existing models, Kimley-Horn will process the model for future demand scenarios on the existing roadway network. The 2015 Peak Month Average Day (PMAD) and 2020 PMAD flight schedules developed under the Master Plan Update will be used as the flight schedules within the ALPS simulation model to forecast the demand. Based on this demand, the demand/capacity and facility requirements will be determined. Following the demand forecasting and demand/capacity assessment, Kimley-Horn will develop the short-term improvements and use the ALPS model evaluate future alternative layouts.

6.0 APPENDIX