



FORT LAUDERDALE-HOLLYWOOD  
INTERNATIONAL AIRPORT  
BROWARD COUNTY, FLORIDA

FLL Master Plan Update  
Policy Advisory Committee (PAC) Briefing #2  
July 10, 2017



(PRELIMINARY DRAFT) WORK IN PROGRESS - FOR DISCUSSION PURPOSES ONLY

# PAC Committee



Provides:

- Input on macro-level policy issues
- Comments relative to the near-term and long-term aviation goals of Broward County
- Guidance on FLL's role in the region
- Community and Regulatory Perspectives

# Agenda

- Master Plan Process
  - Introduction
  - Goals and Objectives
  - Sequence of Study Tasks; Key Questions Addressed by the Master Planning Process
- Baseline Conditions / Today's Environment
- Aviation Activity Forecasts
- Capacity & Operational Conditions
  - Airfield
  - Gates & Terminal Facilities
  - Landside
- Short-Term Improvements
  - Landside
  - Terminal
- Master Plan Concepts for Serving Demand through 2035
  - Terminal
  - Landside
- Next Steps



# Master Plan Process

Introduction, Goals, and Sequence of Study Tasks

# Introduction

- “An airport master plan is a comprehensive study of an airport and usually describes the short-, medium-, and long-term development plans to meet future aviation demand.” – *FAA Advisory Circular 150/5070 – 6B Airport Master Plans*
- Plans focus on addressing long-term (20+ years) needs by establishing a roadmap for incremental development to meet future demand
- Planning methods vary depending on the size and complexity of the airport but include the following key elements: inventory of existing conditions forecasting, demand/capacity, alternatives, environmental/sustainability and financial
- Other considerations may include the highest and best use of existing infrastructure given long term development plans

# FLL Master Plan Goals and Objectives



BALANCE – Airfield/Terminal/Landside/Airspace

RESPOND – to Immediate and Near Term Needs

POSITION – for Future Growth and New Opportunities

ENHANCE – Customer Experience and Connectivity

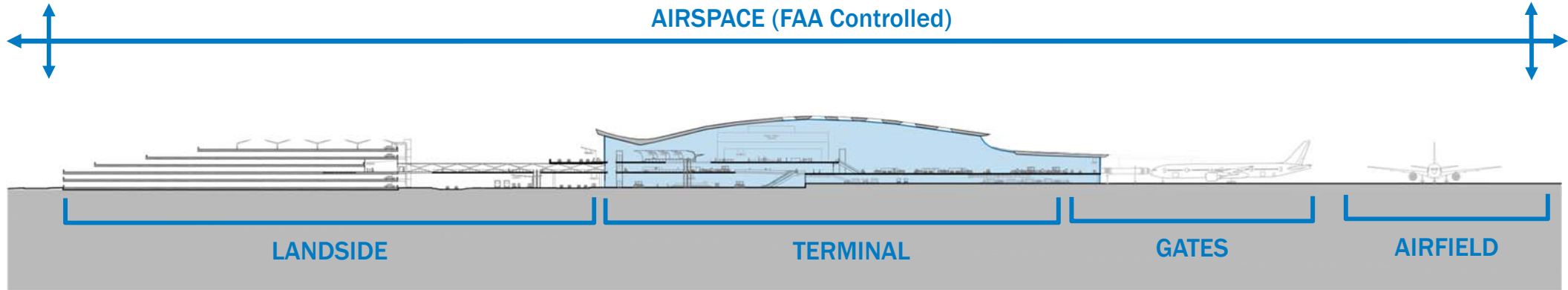
OPTIMIZE – Land Assets and Recent Investments

PRESERVE – FLL’s Identity and Strengths

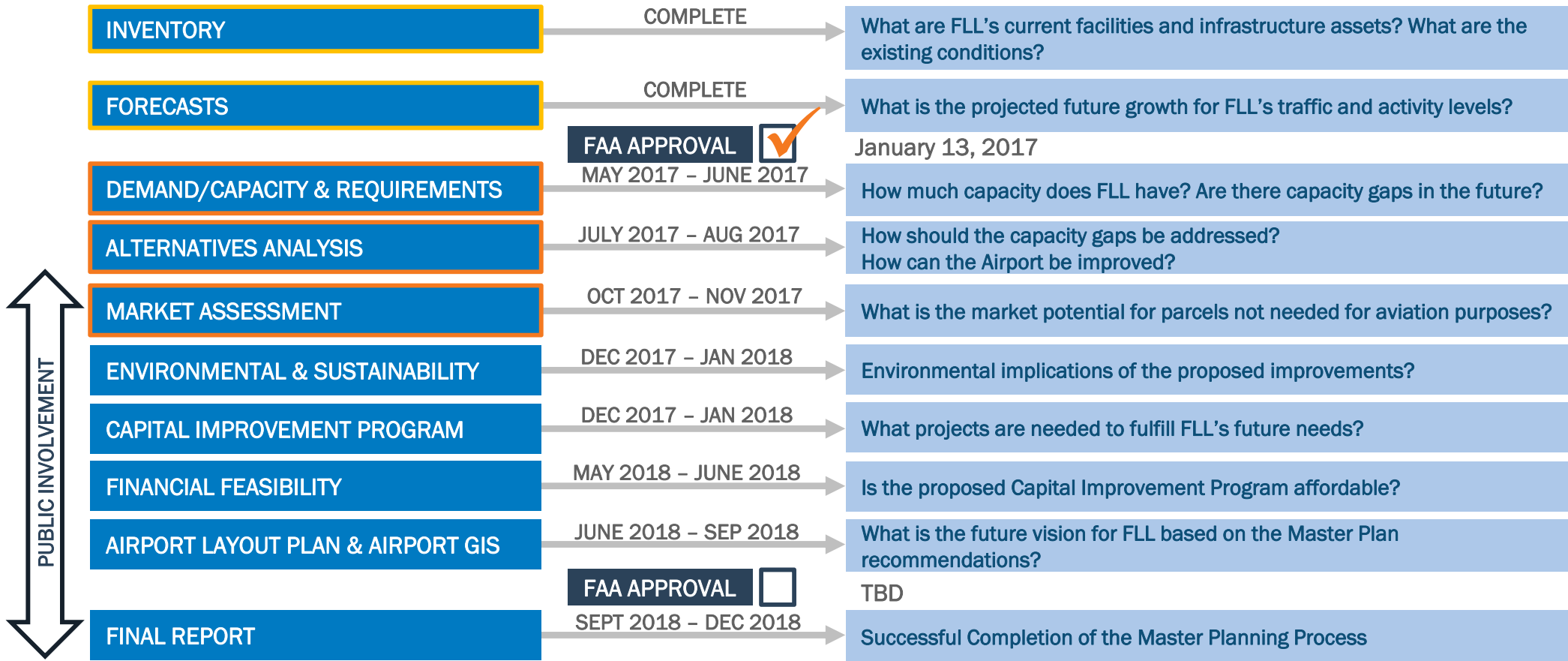
- Broward County’s Asset
- Economic Engine
- Easy In, Easy Out
- Low Cost, High Efficiency

# Master Planning Goal: Landside/Terminal/Gates/Airfield & Airspace Balance

## Representative Airport Layout



# Sequence of Master Planning Tasks

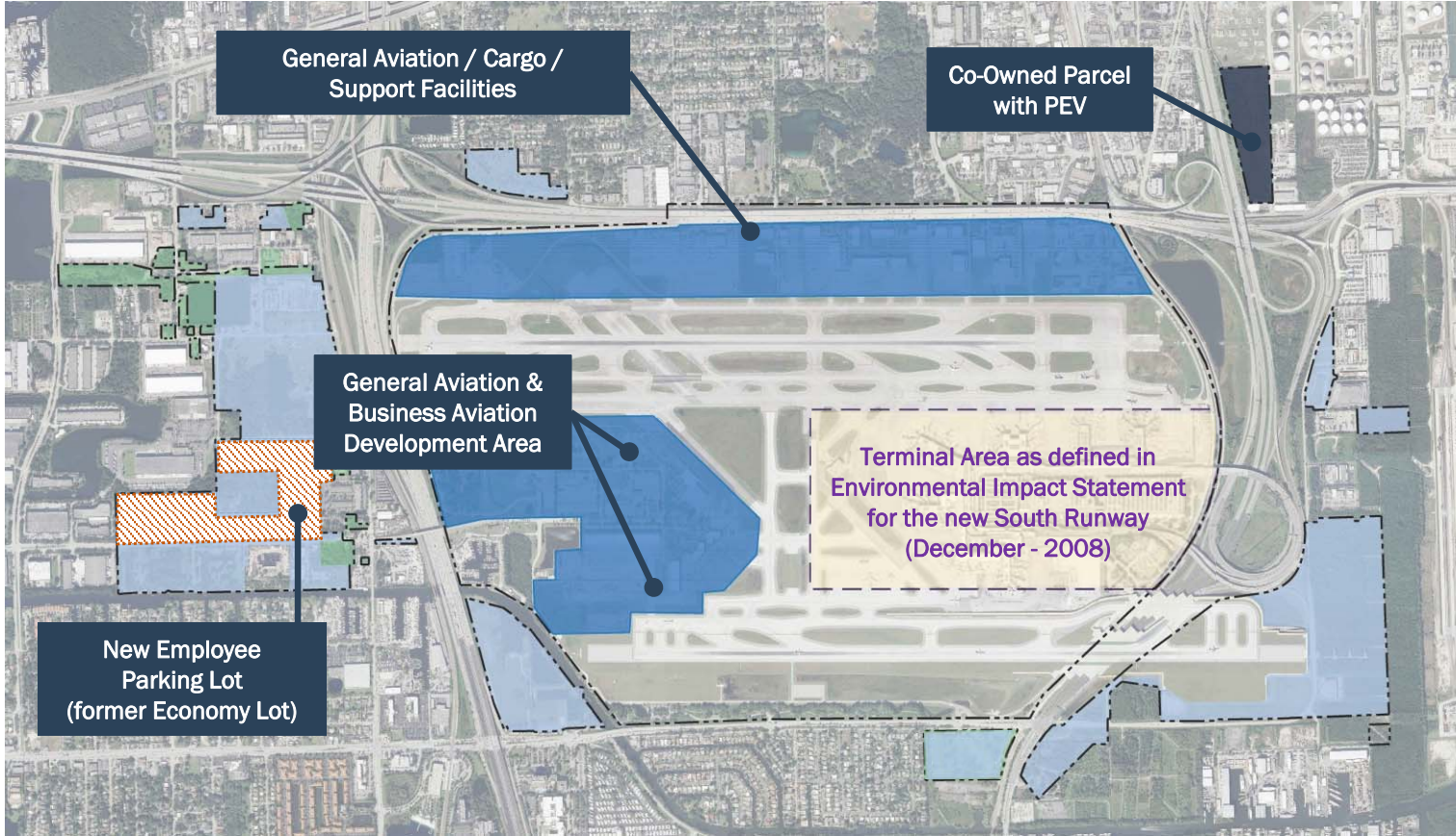




# Baseline Conditions / Today's Environment

Baseline Conditions assume completion of the current  
Capital Improvement Program between now and early 2020

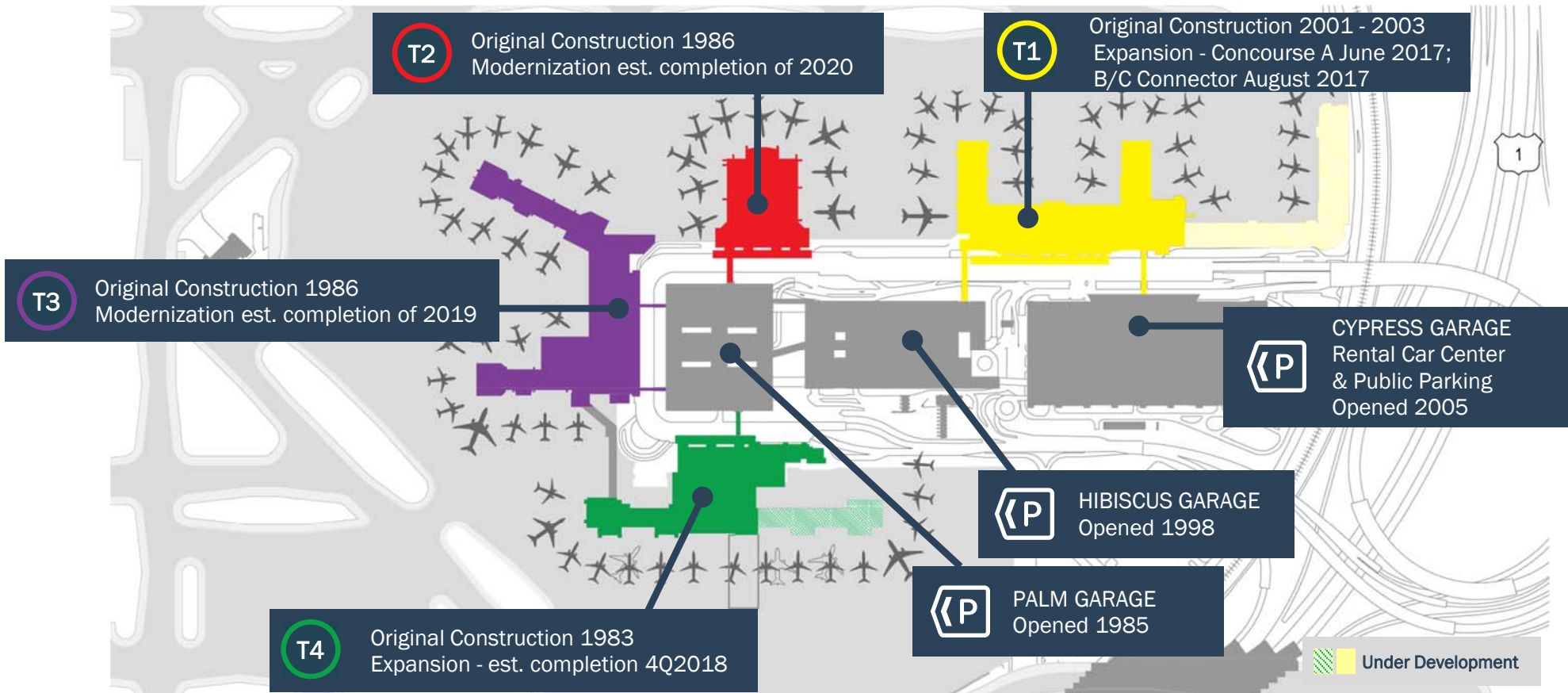
# FLL Baseline Conditions – Land Assets & General Uses



**Legend:**

- Airport Owned Property with limited/restricted development opportunity
- On-Airport Parcels serving Aviation Uses
- Co-Owned Airport Parcel with Development Opportunity
- New Employee Parking Lot (Former Economy Lot)
- Parcels subject to sale or transfer per interlocal agreements

# FLL Baseline Conditions - Terminal Area





# FLL Baseline Conditions – Airfield Improvements



Baseline Conditions assume:

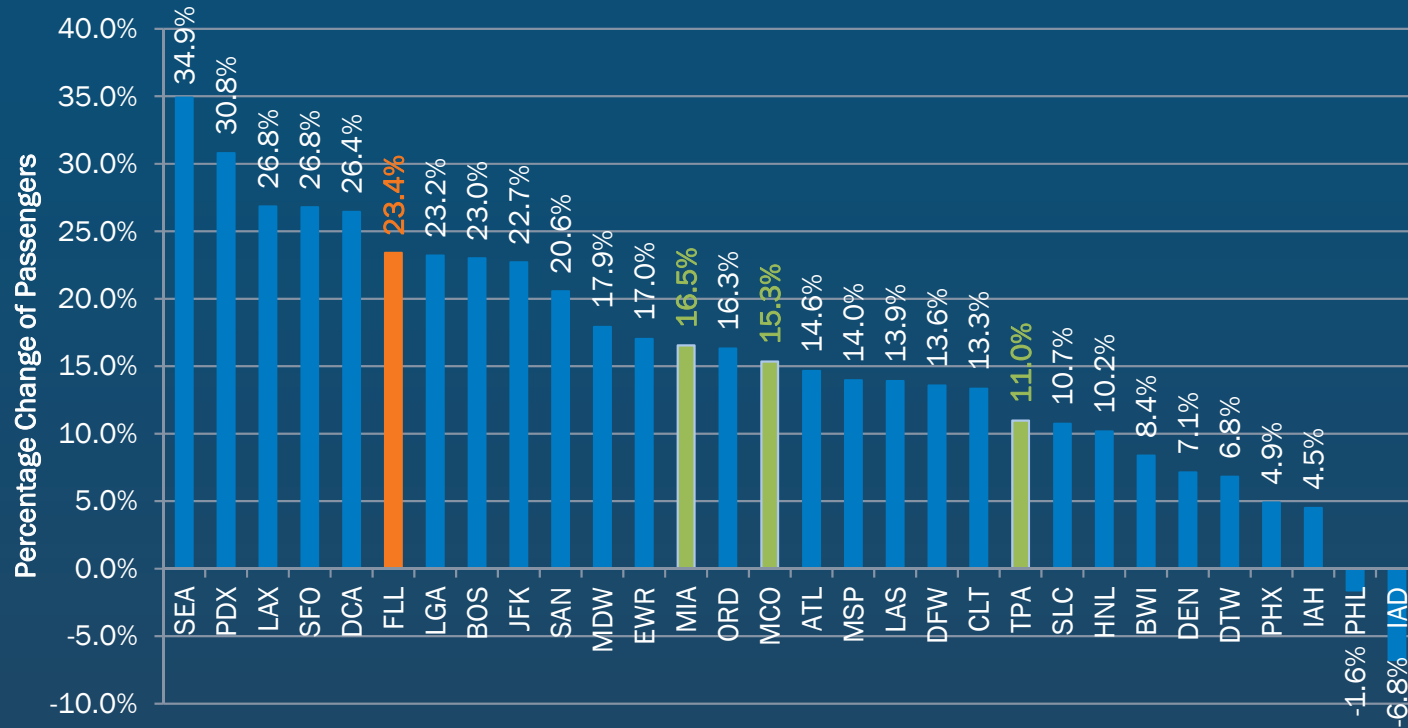
- 1) Runway 10L-28R improvements included as part of the North Airfield Pavement Geometry Evaluation



# FLL Baseline Conditions

## Passenger Growth FY11 – FY16

(PRELIMINARY DRAFT) WORK IN PROGRESS - FOR DISCUSSION PURPOSES ONLY



**NOTES:** Data represents total passengers (enplaned & deplaned) at the U.S. Large Hub Airports.

**SOURCES:** Broward County Aviation Department; US DOT T100; Ricondo & Associates, Inc.

# FLL Baseline Conditions

## Growth Since Completion of South Runway Program (Sept. 2014)

		Total Passengers	Total Operations
Fiscal Year 2015	FLL	10%	8%
	Combined Average Growth of All other Large Hubs	4.5%	0.5%
Fiscal Year 2016	FLL	9%	5%
	Combined Average Growth of All other Large Hubs	4.3%	1.6%

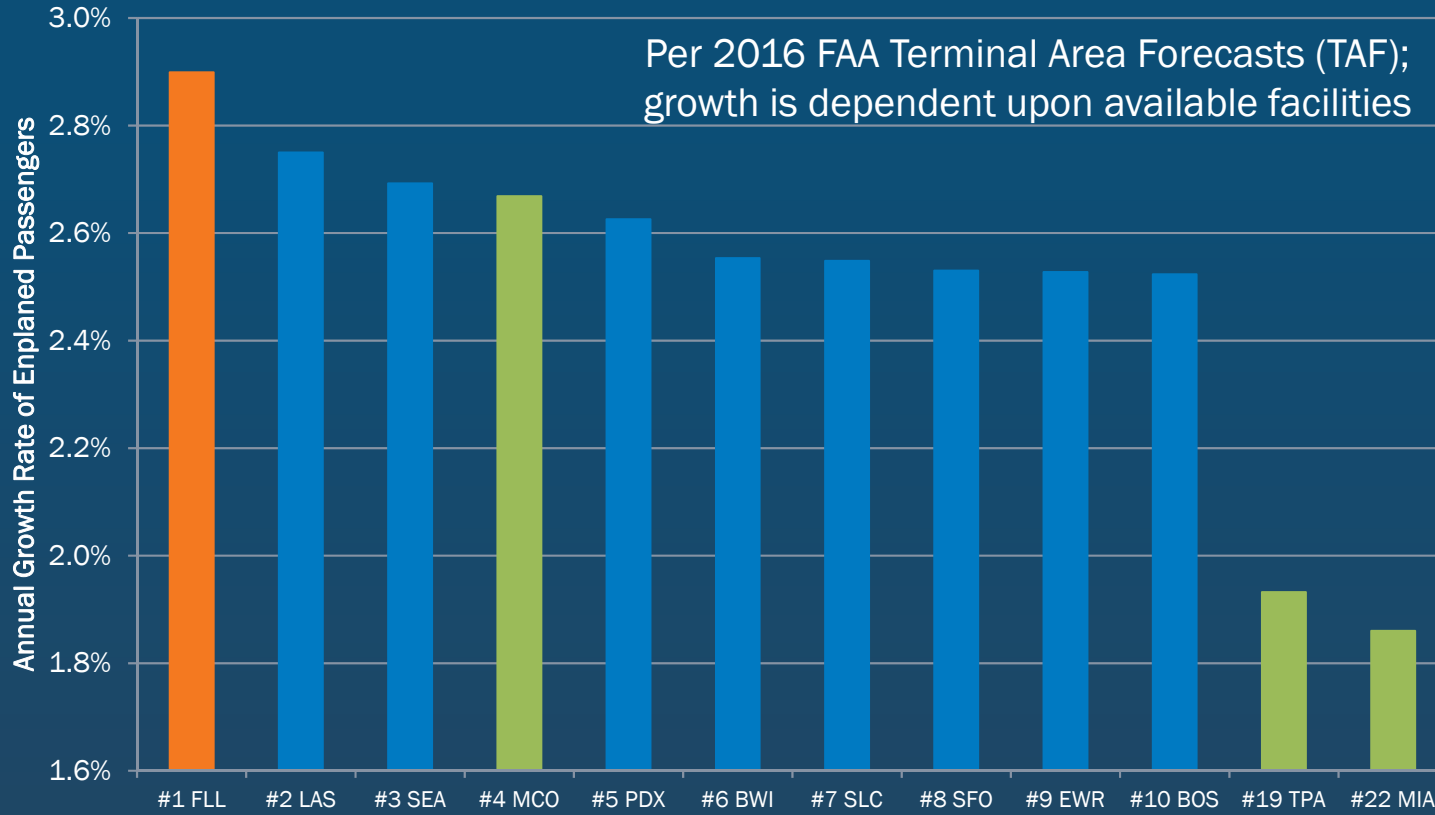
Fiscal Year (FY) represents October 1<sup>st</sup> – September 30th

# Aviation Activity Forecasts

Approved by FAA: January 13, 2017

# Activity Forecasts

## Projected Growth – FY2016 - 2035



**NOTES:** Data represents revenue enplaned passengers at U.S. Large Hub Airports and is sorted (largest to smallest) based on compound annual growth rates for the period noted. The top 10 airports (as well as MIA and TPA) are shown.

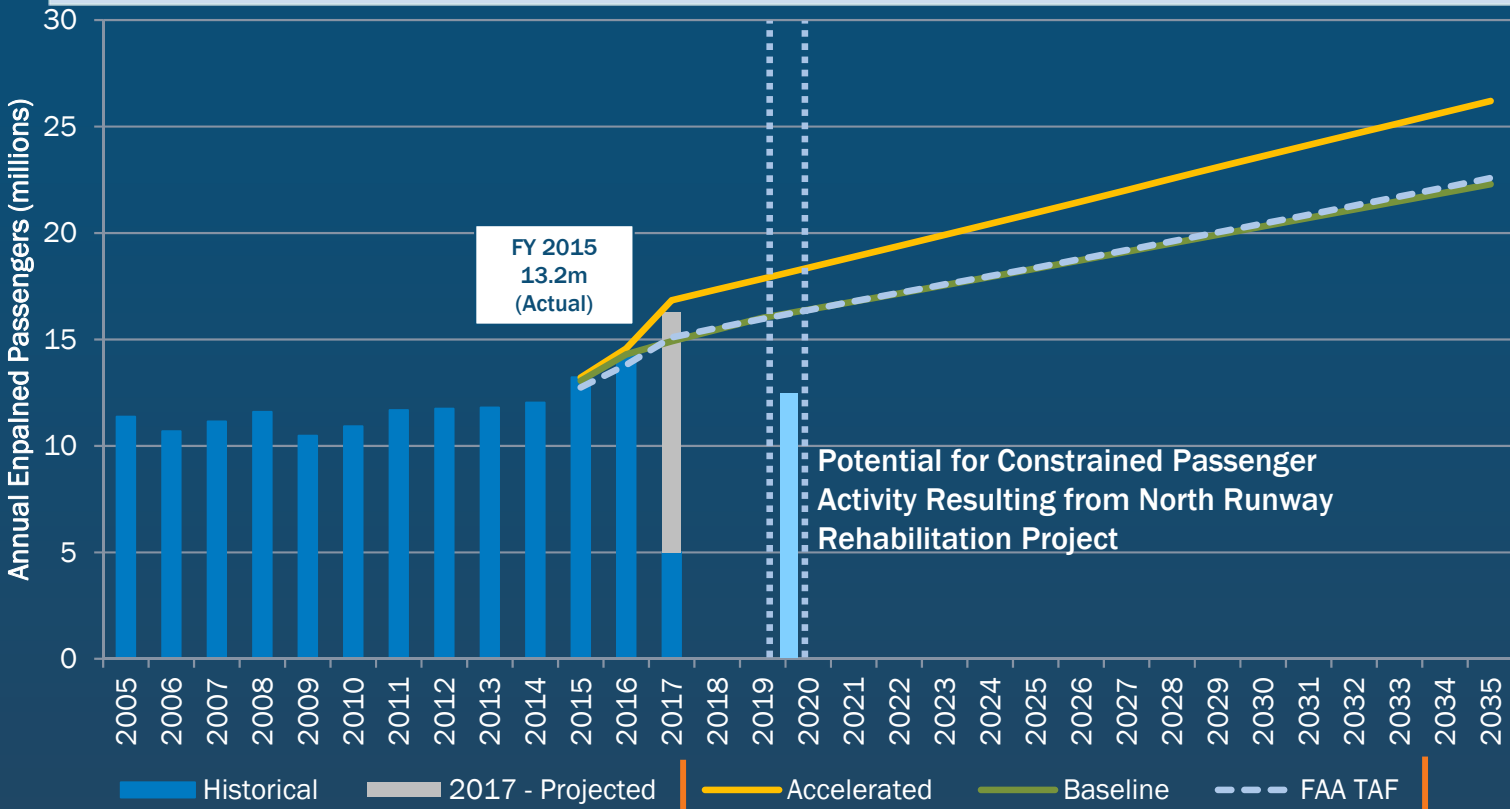
**SOURCES:** Federal Aviation Administration, 2016 Terminal Area Forecast, Published January 2017; Ricondo & Associates, Inc.



# Activity Forecasts – Enplaned Passengers

## Baseline, Accelerated Baseline, and FAA 2016 TAF

NOTE: Accelerated growth is dependent upon available facilities (specifically gates).



**Accelerated**  
26.2 m  
3.5% CAGR

**Baseline**  
22.3m  
2.7% CAGR

**FAA 2016 TAF**  
22.6m  
2.9% CAGR

NOTES: CAGR = Compound Annual Growth Rate. Total passengers equals two times enplaned passengers. FY 2017 is based on four months of actual data and eight months of projected data.

Baseline forecasts estimate future airport activity predominantly based on trend analysis of historical activity, consideration of FLL's existing share of South Florida's demand for air service, socioeconomic data, and local/national trends.

The Accelerated Baseline forecasts reflect higher growth at the Airport, particularly in the short-term based on discussions with several airlines operating at FLL regarding their growth plans, and the potential for FLL securing a larger share of South Florida's demand for air service.

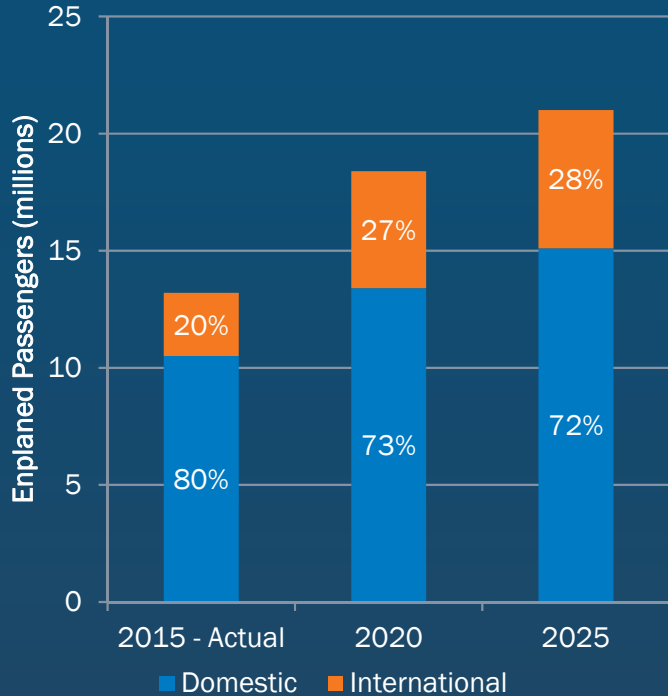
SOURCES: Broward County Aviation Department (Historical); US DOT T100; Innovata; FAA Terminal Area Forecasts; Ricondo & Associates, Inc.

Potential for Constrained Passenger Activity Resulting from North Runway Rehabilitation Project

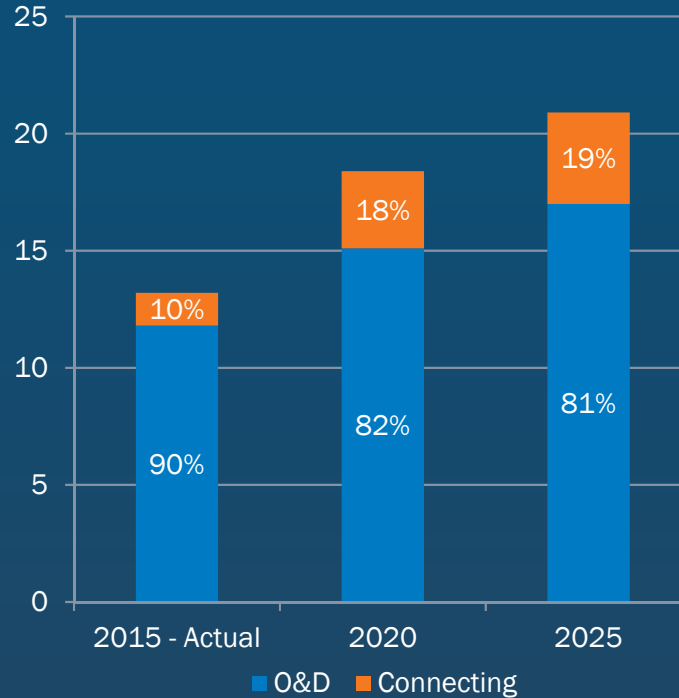
Forecasts

# Activity Forecasts – Changing Passenger Demographic

### Domestic vs. International



### Originating vs. Connecting



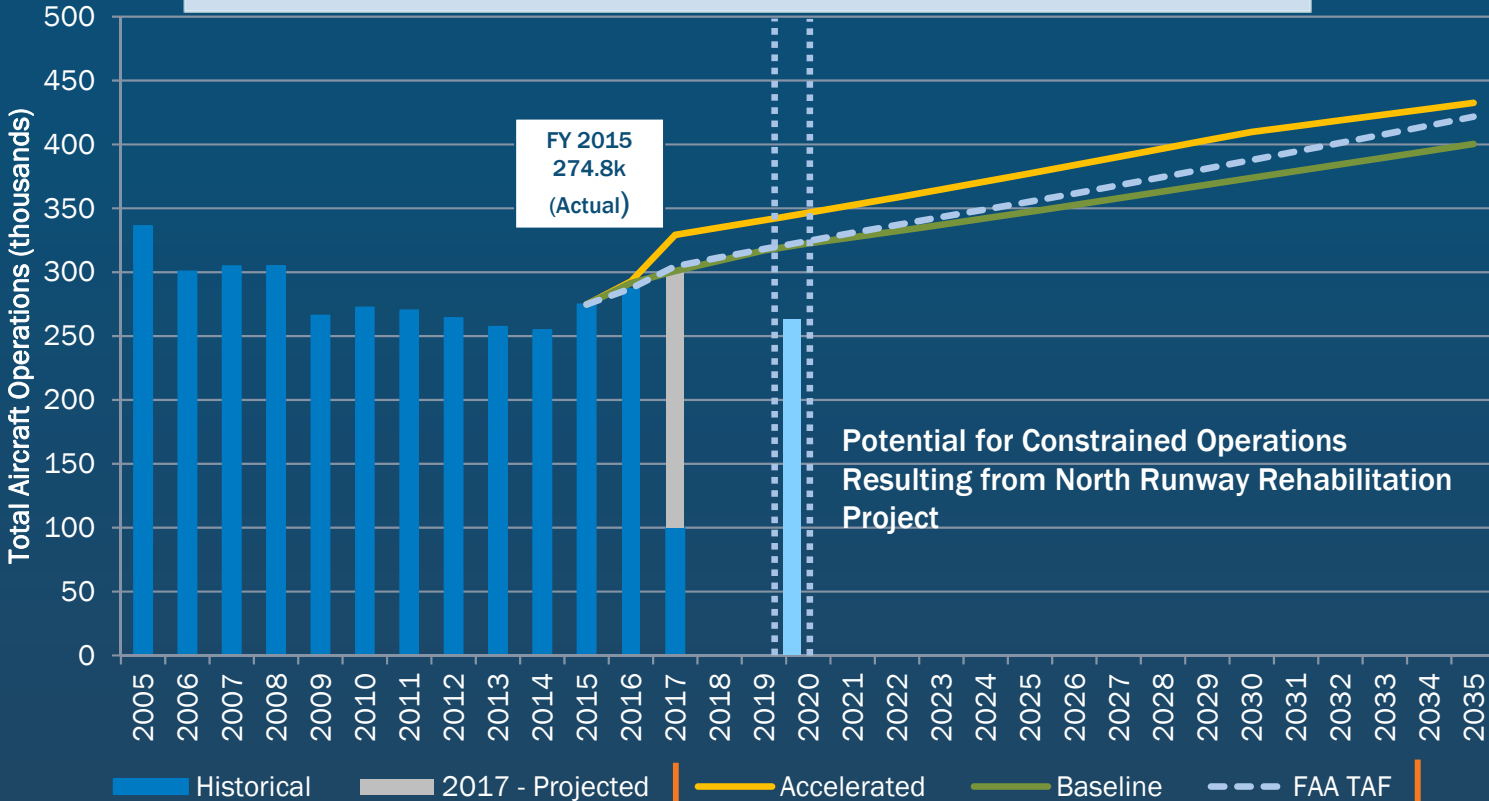
**NOTE:** Percentages for 2015 represent actual data.

**SOURCES:** Broward County Aviation Department (historical); Innovata; US DOT O&D Survey (DB1B); Ricondo & Associates, Inc.

# Activity Forecasts

## Aircraft Operations - As Approved by FAA on January 13, 2017

An operation is defined as either an aircraft takeoff or landing



Accelerated 432.6k 2.3% CAGR
FAA 2016 TAF 421.8k 2.2% CAGR
Baseline 400.3k 1.9% CAGR

**NOTES:** CAGR = Compound Annual Growth Rate. FY 2017 is based on four months of actual data and eight months of projected data.

Baseline forecasts estimate future airport activity predominantly based on trend analysis of historical activity, consideration of FLL's existing share of South Florida's demand for air service, socioeconomic data, and local/national trends.

The Accelerated Baseline forecasts reflect higher growth at the Airport, particularly in the short-term based on discussions with several airlines operating at FLL regarding their growth plans, and the potential for FLL securing a larger share of South Florida's demand for air service.

**SOURCES:** Broward County Aviation Department (historical); Innovata; FAA Air Traffic Activity Systems; FAA Terminal Area Forecasts; Ricondo & Associates, Inc.

Potential for Constrained Operations Resulting from North Runway Rehabilitation Project

Forecasts

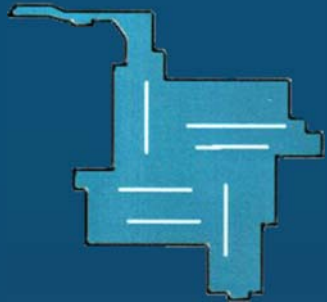
# Capacity & Operational Conditions

Airfield, Terminal and Landside Systems



# Airfield

# FLL operates on a very small footprint compared to other large hubs



DEN 33,920 acres  
566,035 operations  
17 operations per acre



DFW 18,076 acres  
676,890 operations  
37 operations per acre



IAH 10,000 acres  
479,778 operations  
48 operations per acre



ORD 7,700 acres  
872,332 operations  
113 operations per acre



ATL 4,700 acres  
899,040 operations  
191 operations per acre



LAX 3,586 acres  
685,889 operations  
191 operations per acre



LAS 2,853 acres  
532,979 operations  
187 operations per acre

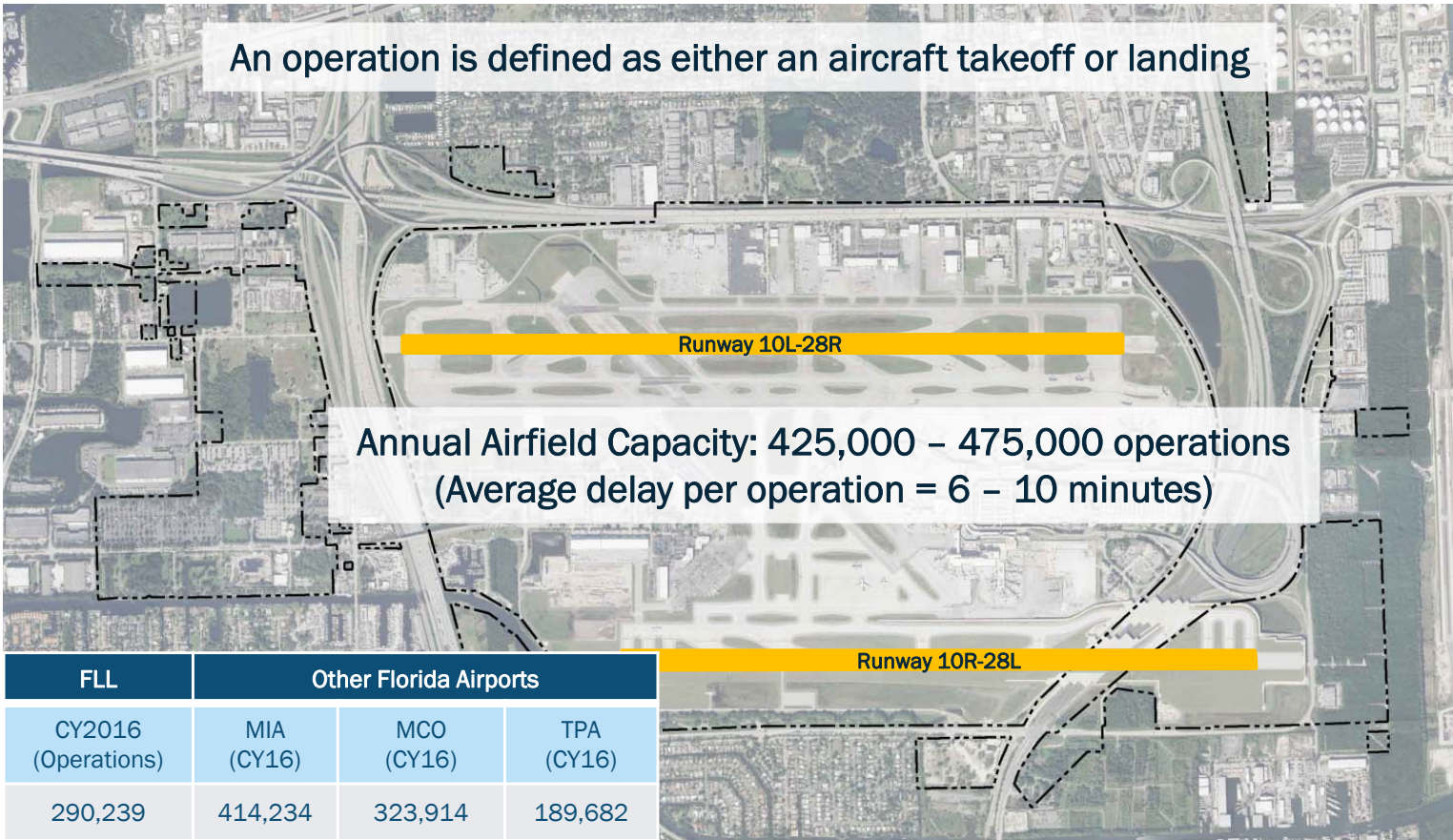


FLL 1,400 acres  
287,264 operations  
205 operations per acre

SOURCES: FAA Air Traffic Activity System (ATADS), FFY2016 Operations Data

# Airfield Capacity Review

An operation is defined as either an aircraft takeoff or landing



FLL	Other Florida Airports		
CY2016 (Operations)	MIA (CY16)	MCO (CY16)	TPA (CY16)
290,239	414,234	323,914	189,682

## Future Demand

10-year baseline demand  
(Projected 2025 per forecast):

- 347,000 annual operations

20-year baseline demand  
(Projected 2035 per forecast):

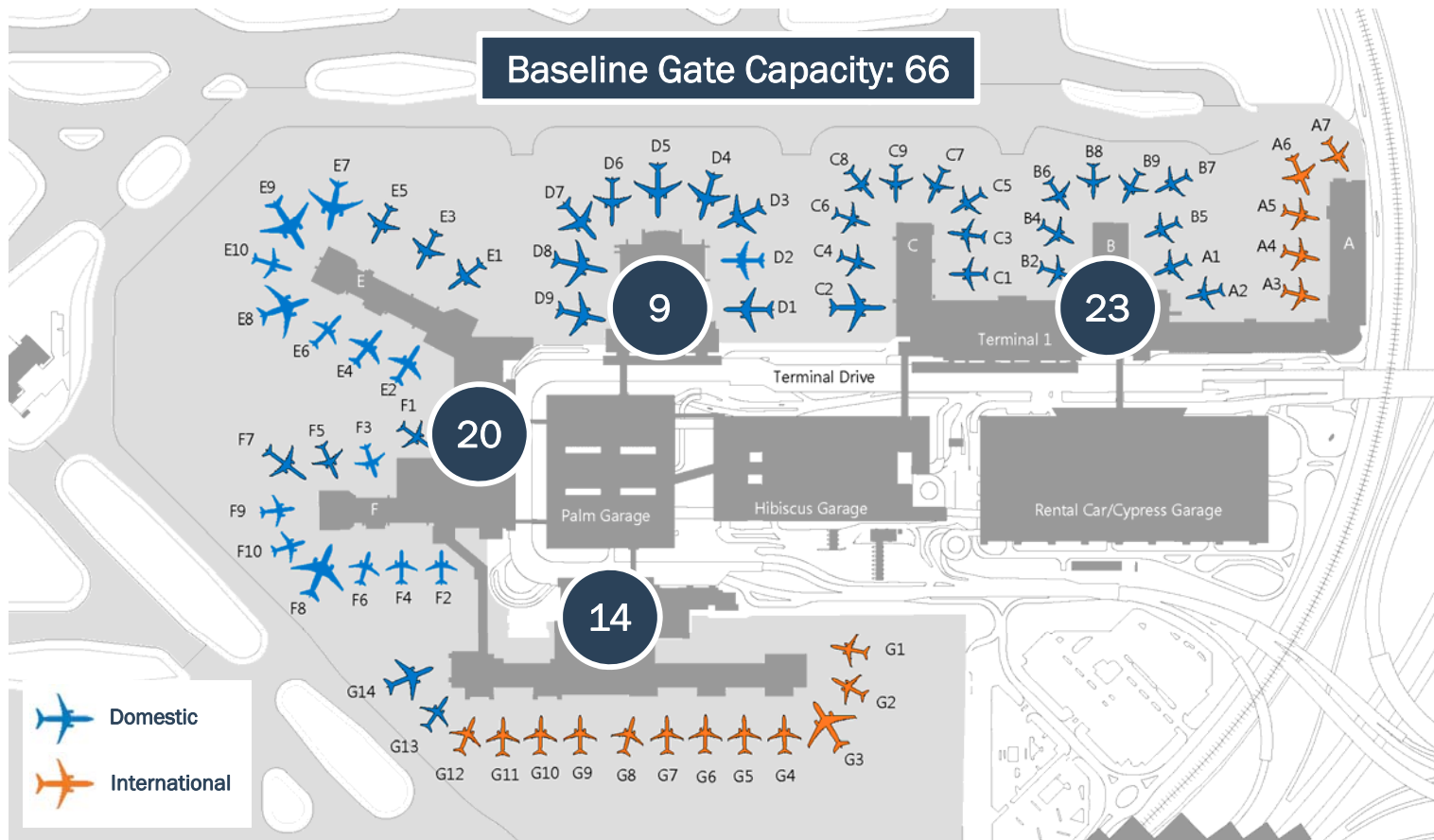
- 400,000 annual operations
- An airfield is considered to be reaching its capacity when the average annual delay per operation reaches 6-10 minutes



# Gates & Terminal Facilities



# Gate Capacity & Future Needs



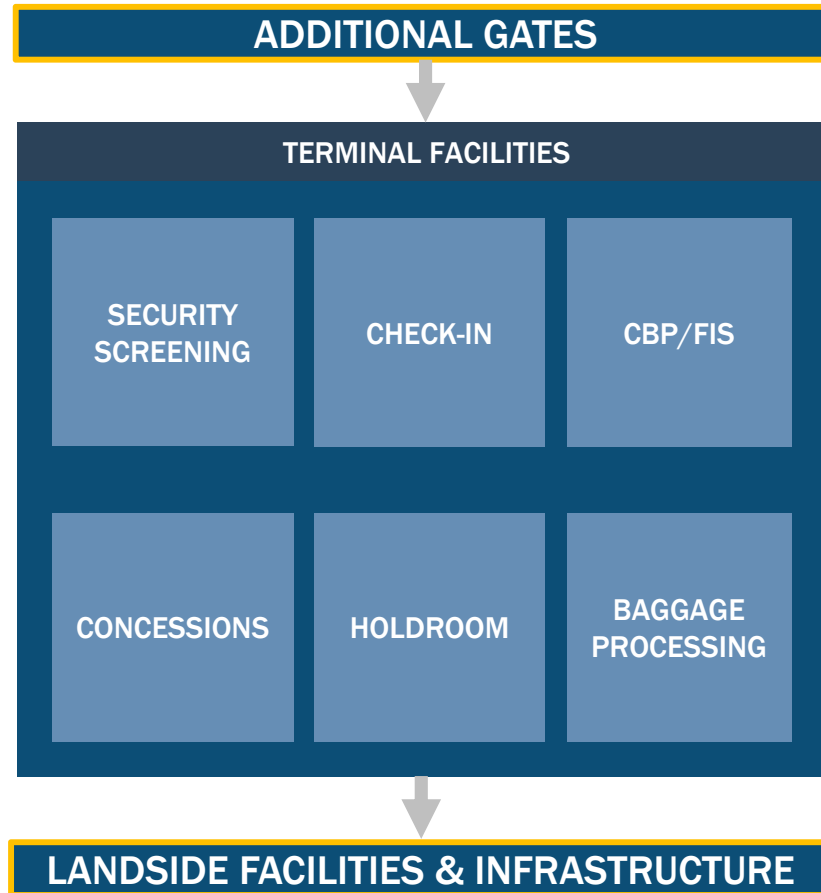
FY2016: 28.7 MAP  
CY2016: 29.2 MAP

Future gate requirements:

- 37 MAP (On or before 2020)
  - 70 - 72 gates
- 42 MAP (On or before 2025)
  - 75 - 77 gates
- 53 MAP (On or before 2035)
  - 83 - 85 gates

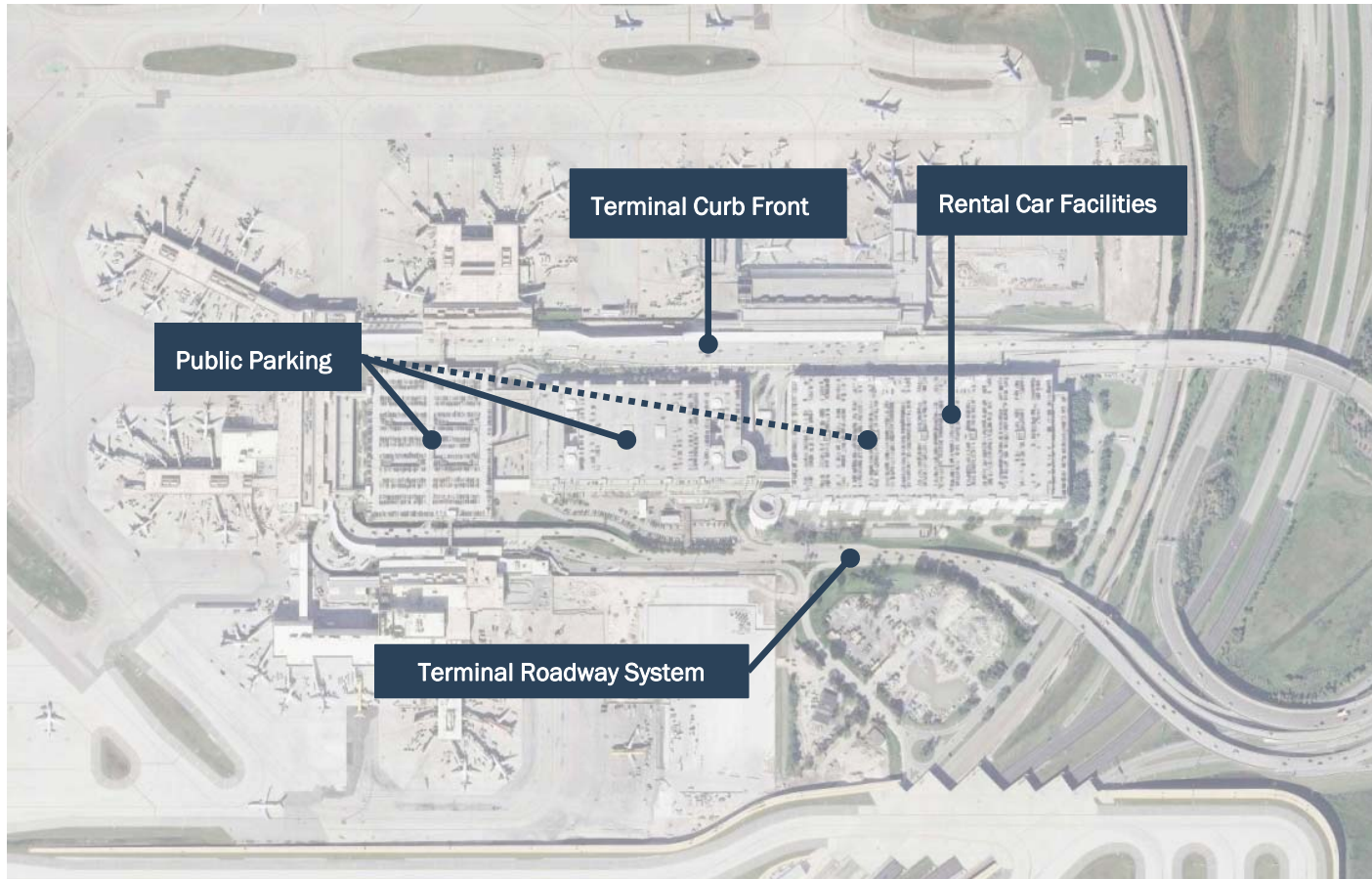
Notes:  
MAP: Million Annual Passengers

# New Gates Require Terminal Processing Support Functions



# Landside

# Landside Facilities & Infrastructure





# Terminal Curbfront

## Level of Service (LOS) Characteristics (Illustrative)



Free flow – no interference



Relatively free flow – some double parking



Double & sometimes triple parking – Planning Conditions



Triple parking – Through lanes capacity impacted/reduced



Gridlock – Consistent congestion & delay

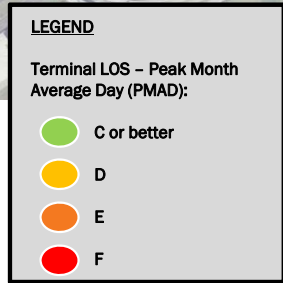
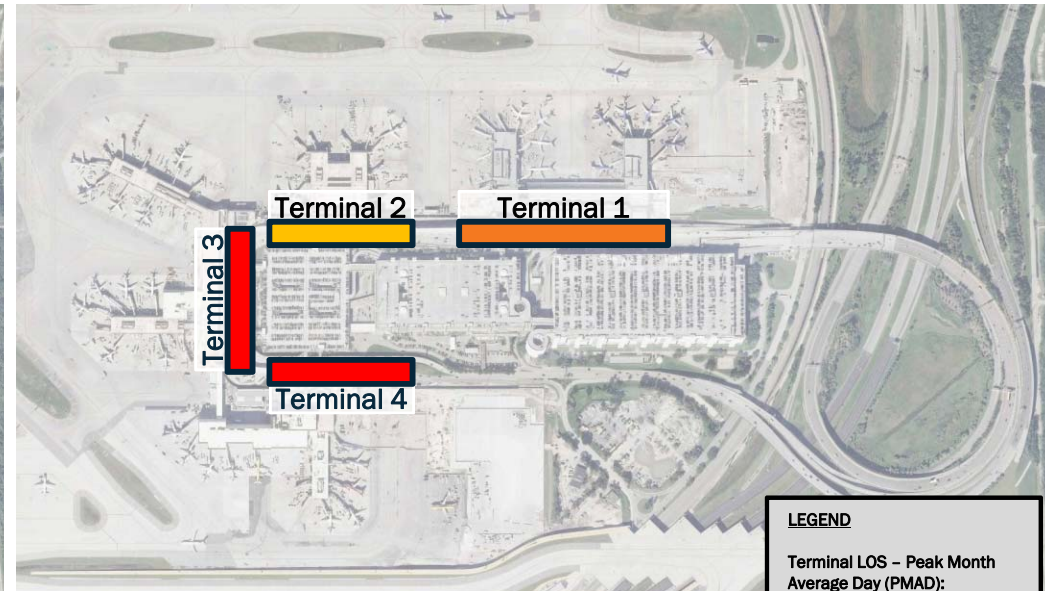
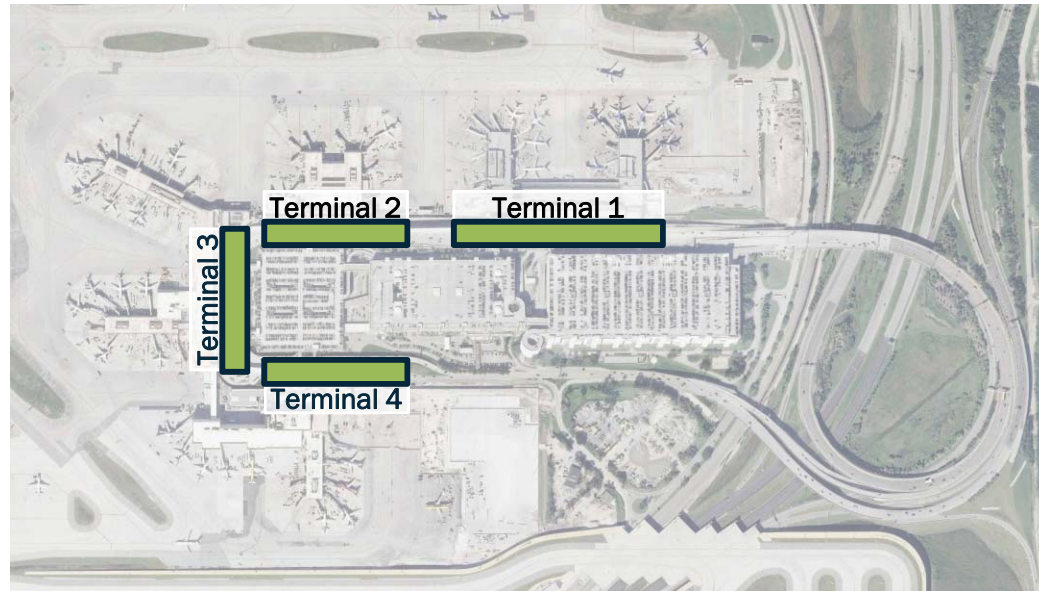
SOURCES: ACRP Report 25,  
*Airport Passenger Terminal Planning and Design*



# Terminal Curbside LOS – Existing Conditions

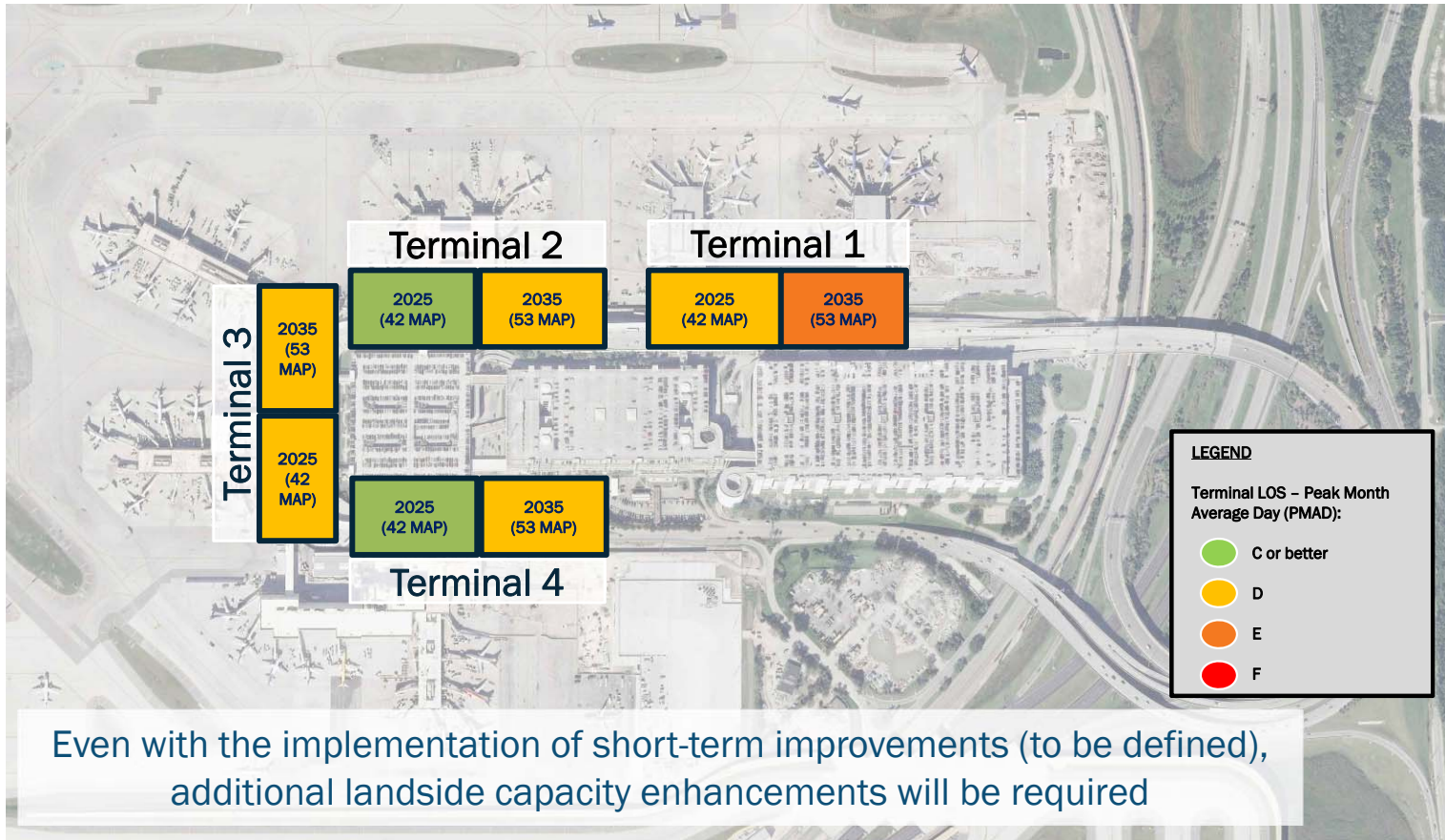
Departures Curb (Upper Level Roadway)

Arrivals Curb (Lower Level Roadway)



Immediate/short-term improvements are necessary to address existing conditions

# Departures Level Terminal Curbside LOS - Forecast



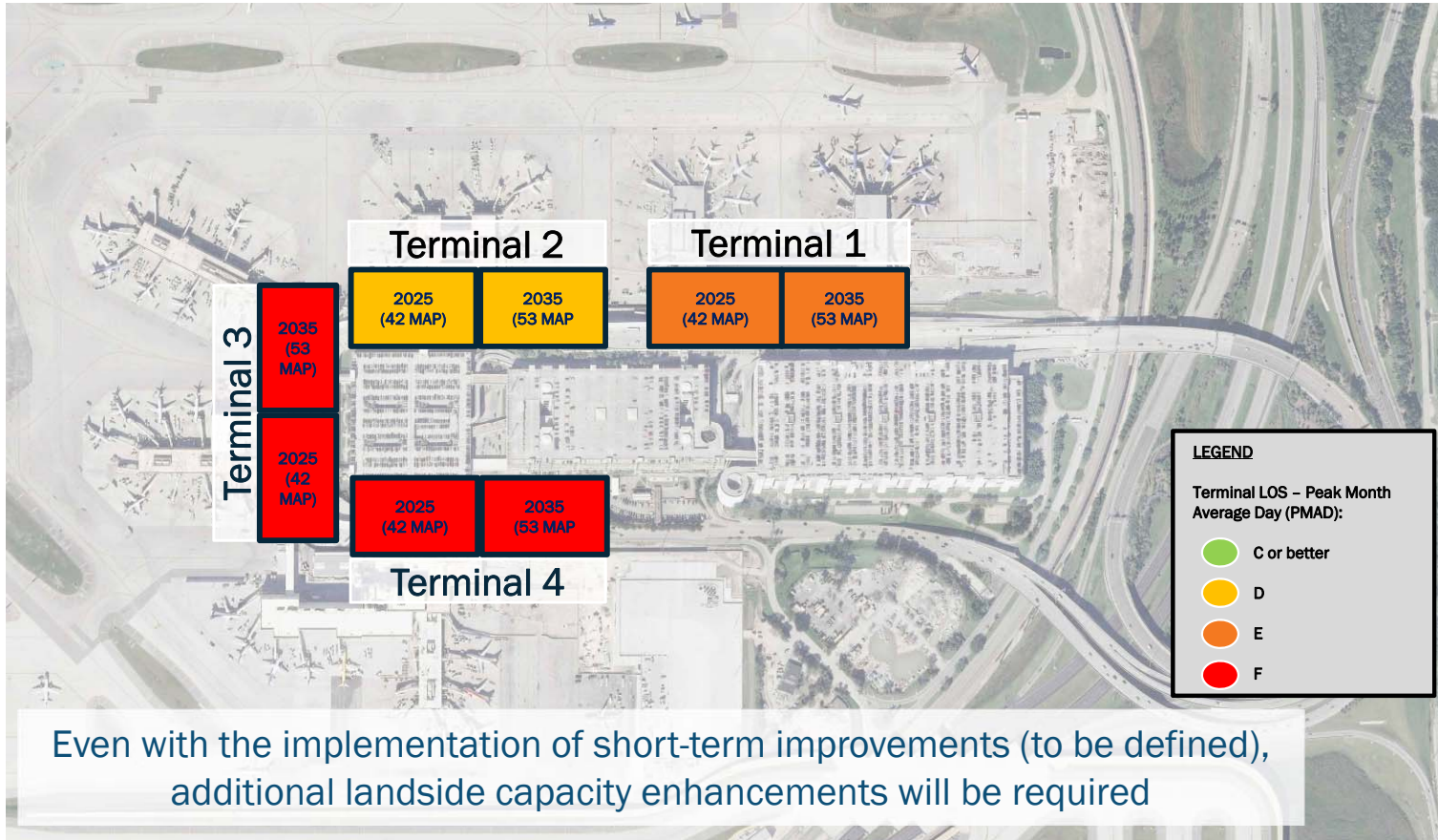
MAP: Million Annual Passengers

Even with the implementation of short-term improvements (to be defined), additional landside capacity enhancements will be required

Note: 20-year horizon, per forecast, 42 MAP estimated to be on or before 2025 and 53 MAP estimated to be on or before 2035



# Arrivals Level Terminal Curbside LOS - Forecast



MAP: Million Annual Passengers

**LEGEND**

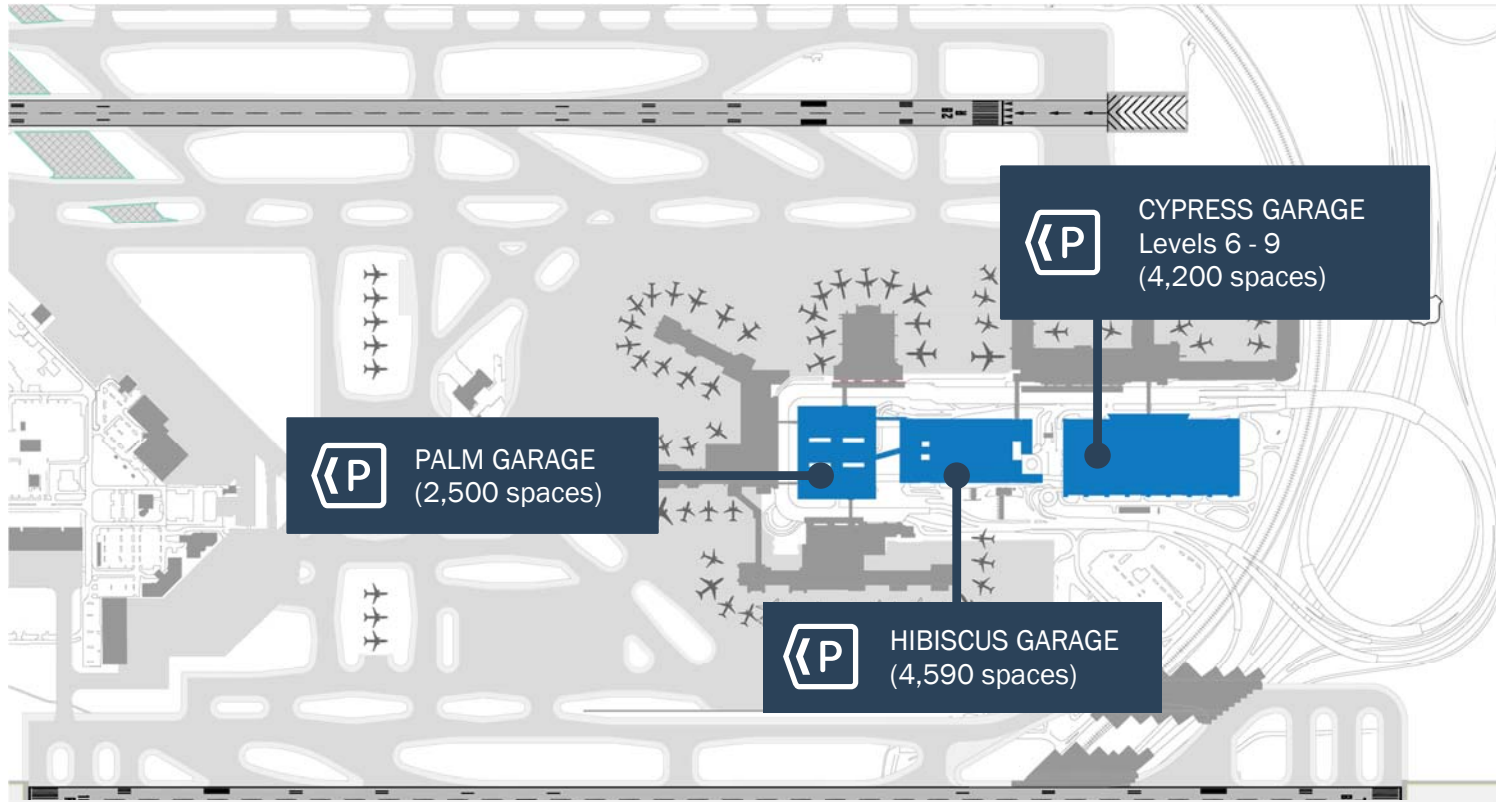
Terminal LOS – Peak Month Average Day (PMAD):

- C or better
- D
- E
- F

Note: 20-year horizon, per forecast, 42 MAP estimated to be on or before 2025 and 53 MAP estimated to be on or before 2035

Even with the implementation of short-term improvements (to be defined), additional landside capacity enhancements will be required

# Public Parking Summary



FY 2016 MAP: 28.7  
CY 2016 MAP: 29.2

(Total Spaces as of May 2017: 11,290)

Future public parking requirements (including valet):

- 37 MAP (On or before 2020)
  - 9,440 hourly/daily spaces
  - 3,430 long-term spaces
  - **12,870 total spaces**
- 42 MAP (On or before 2025)
  - 10,640 hourly/daily spaces
  - 3,870 long-term spaces
  - **14,510 total spaces**
- 53 MAP (On or before 2035)
  - 13,020 hourly/daily spaces
  - 4,740 long-term spaces
  - **17,760 total spaces**

Notes: MAP: Million Annual Passengers and Parking requirements include spaces for long-term parking, historically served through the economy parking product. Assumes accelerated forecast

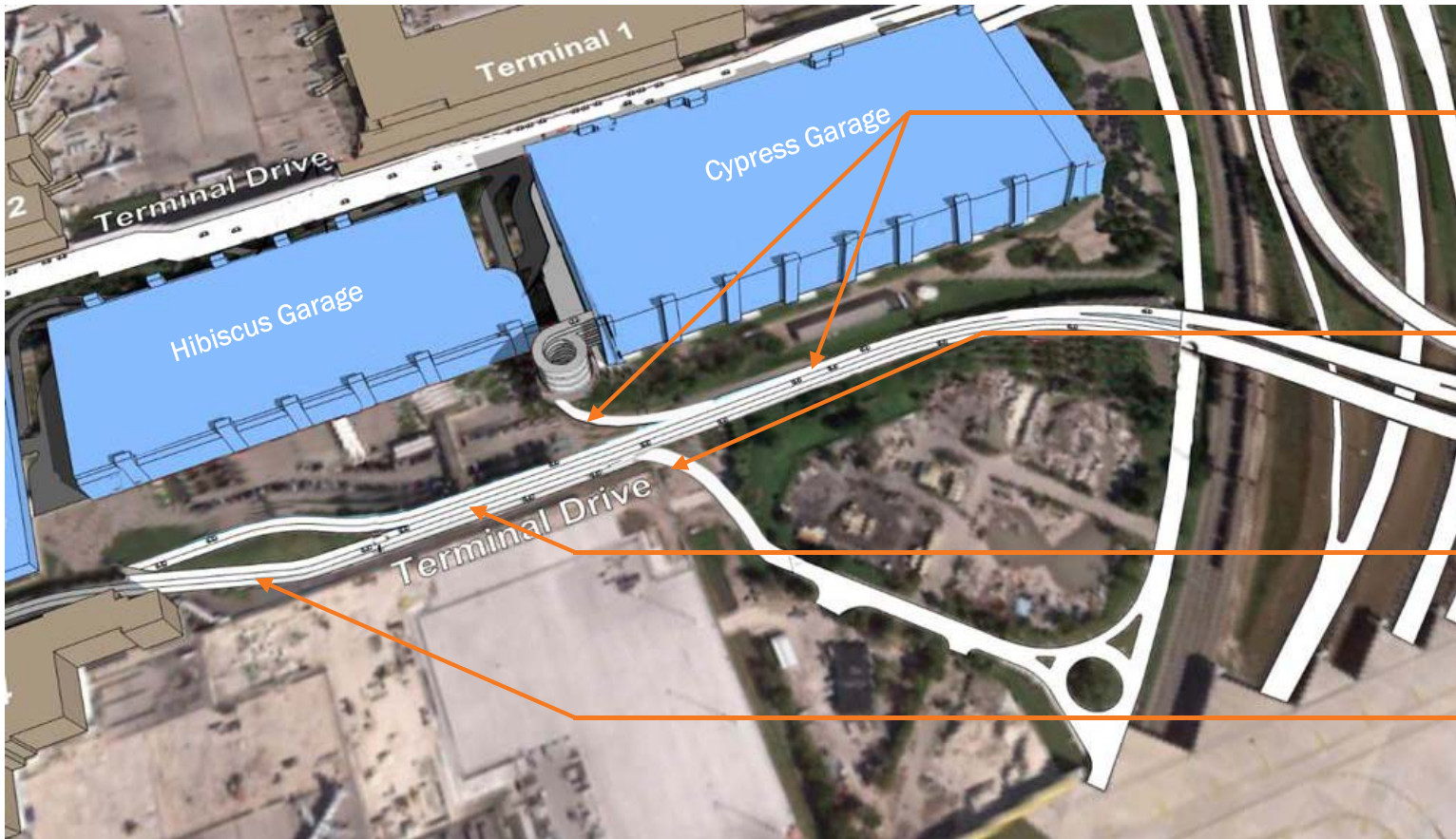
# Short-Term Improvements

Landside & Terminal



# Landside

# Existing Roadway Congestion



- Limited weave distance (exiting garage and RCC)
- Roadway narrows from 4 to 3 lanes
- Departures level vehicles cause cross-weaving with arrivals traffic (to Perimeter Road)
- Roadway narrows from 4 to 3 lanes
- Merge point for arrivals and departures roadways
- Limited weave distance
- Roadway narrows from 4 to 3 lanes



# Merging/Weaving & Exit Roadway Improvements



- Provides greater decision distance for vehicles exiting Cypress and merging onto outbound terminal roadway
- Channels northbound and southbound traffic to minimize weaving
- Adds a new lane to the outbound terminal roadway
- New connection to Perimeter Road minimized weaving
- Proposed Cell Phone Lot Area

# Roadway Management Technology (Flexing) - Dynamic Messaging Signs (DMS)



- Locate DMS prior to Arrivals & Departures Signs
- DMS to show travel time on each level or congested level alert
- Continue with FDOT coordination to have DMS on US-1 and I-595 (If possible)
- 3 New static signs proposed under separate project



# Pedestrian Signalized Crosswalks

## Illustrative Example

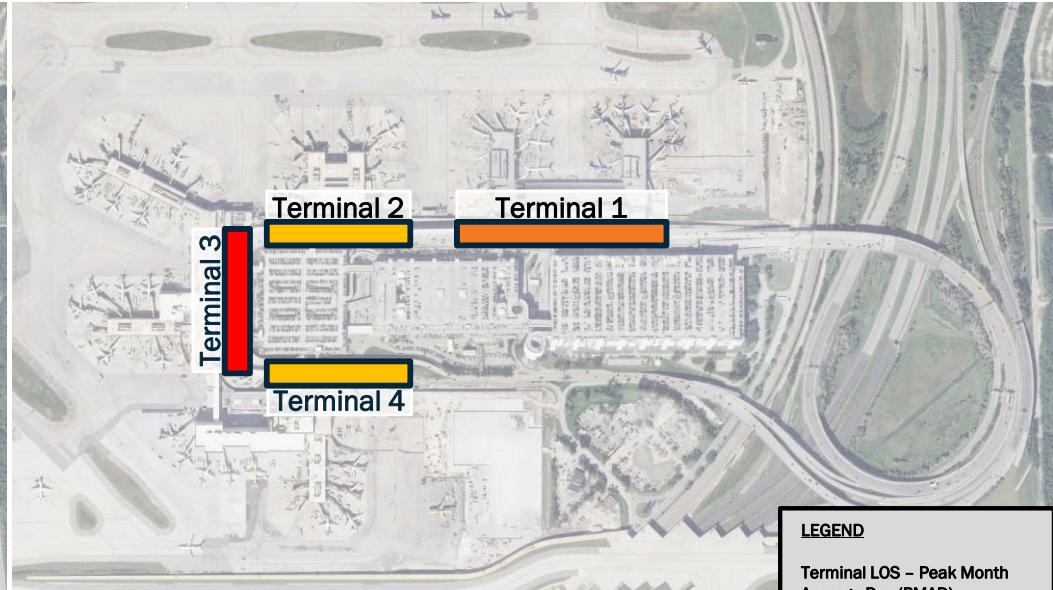
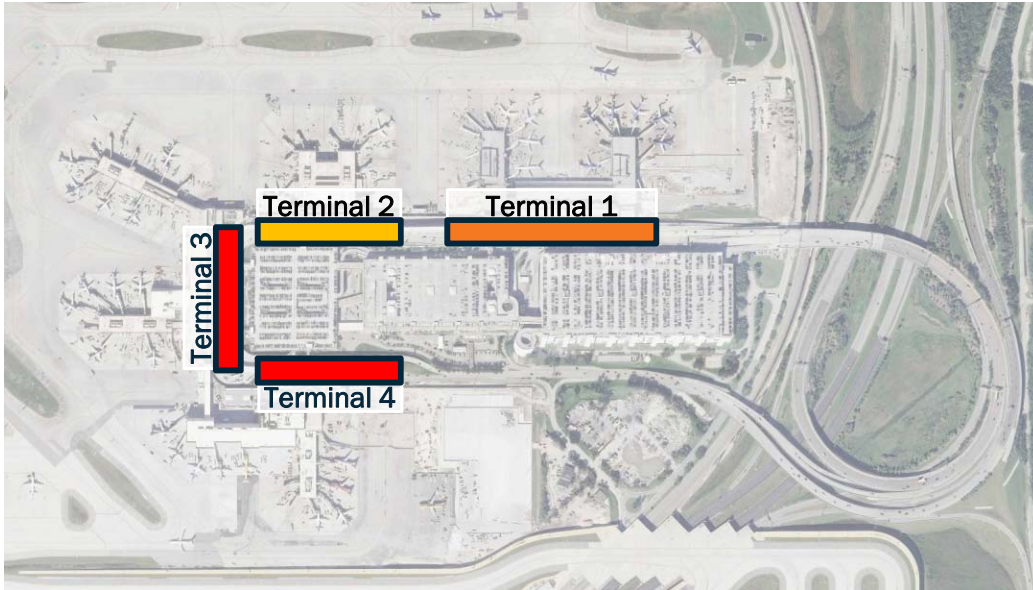


Photo Source: Google – John Wayne Airport

# Arrivals Level Terminal Curbside LOS

Existing Conditions (2015)

2020 Conditions with Short-term Improvements



**LEGEND**

Terminal LOS - Peak Month Average Day (PMAD):

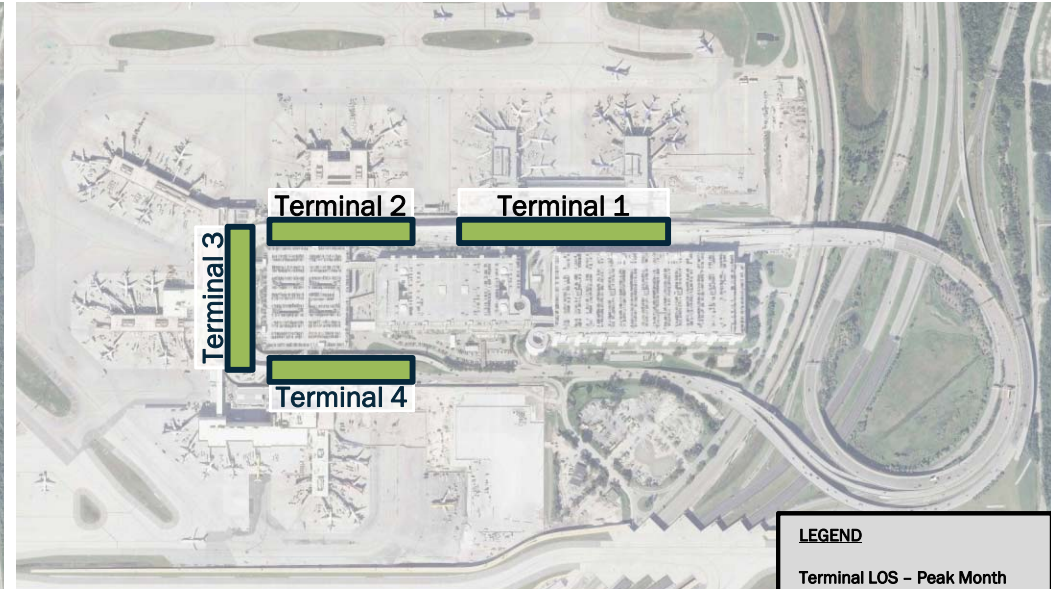
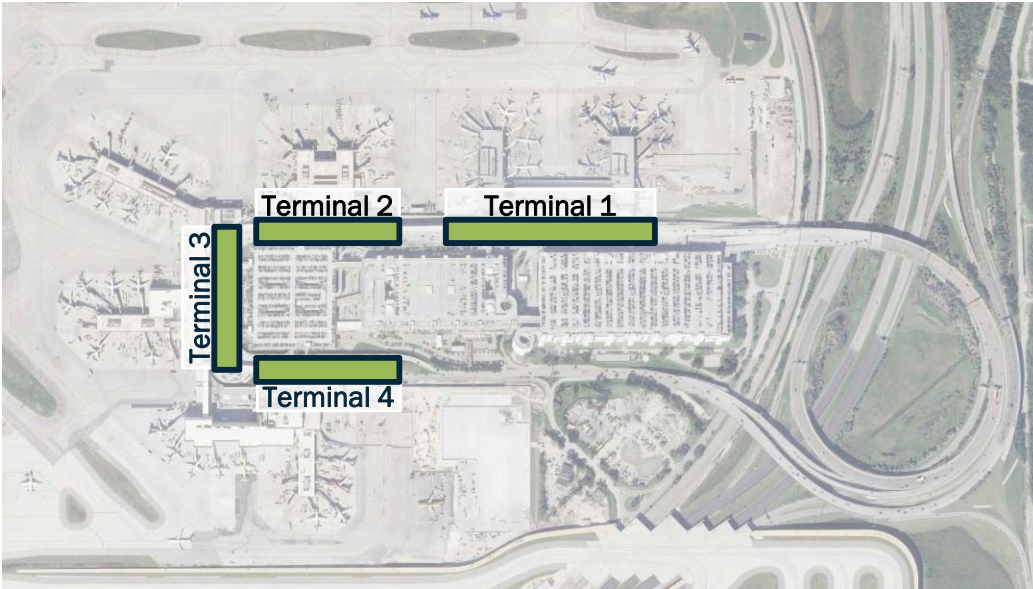
- C or better
- D
- E
- F



# Departures Level Terminal Curbside LOS

Existing Conditions (2015)

2020 Conditions with Short-term Improvements



**LEGEND**

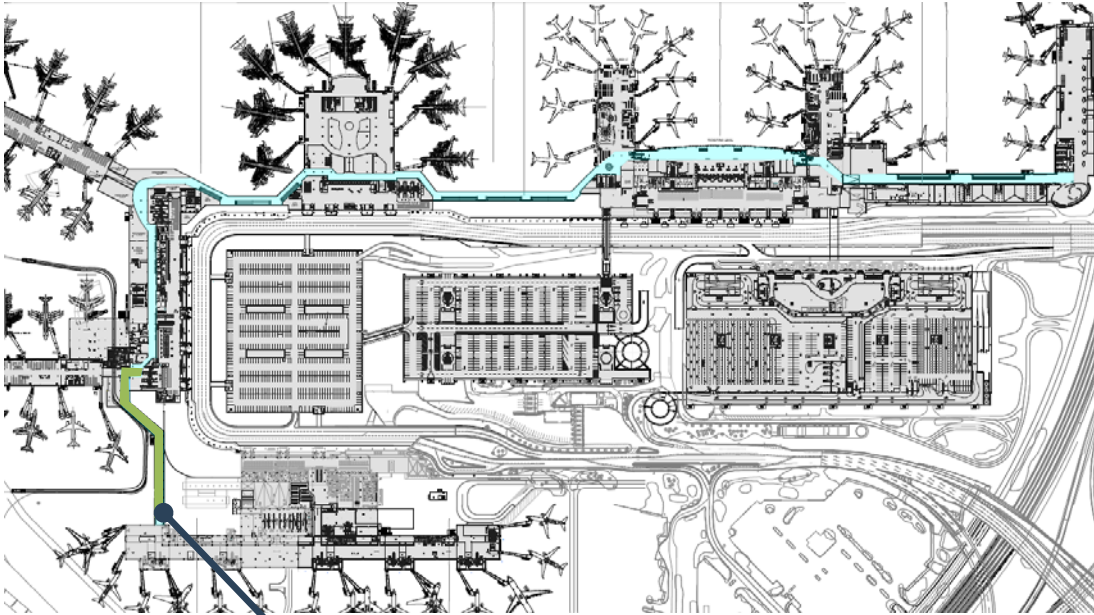
Terminal LOS - Peak Month Average Day (PMAD):

- C or better
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- E
- F

# Terminal



# Post-Security Checkpoint Terminal Connection Plan



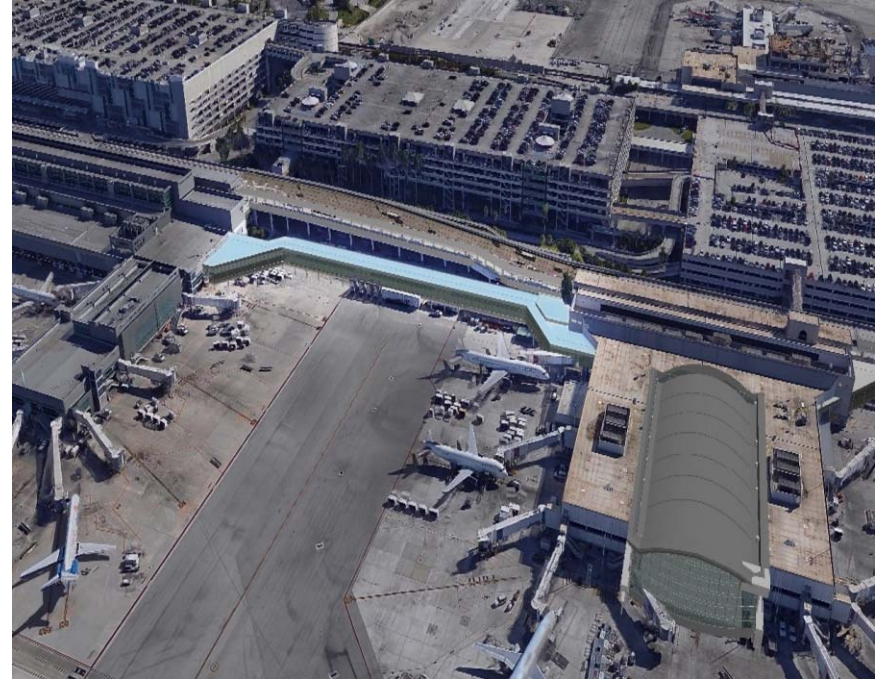
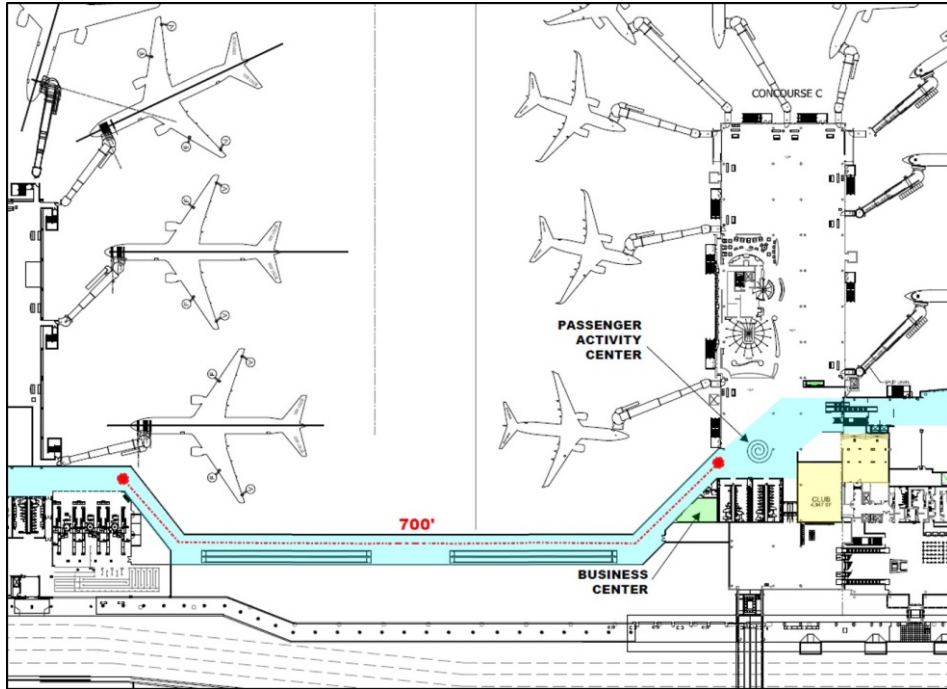
T3-T4 Connector completed  
November 2016



# Terminal Connection Plan

## Proposed T1-T2 Connector Concept

(PRELIMINARY DRAFT) WORK IN PROGRESS - FOR DISCUSSION PURPOSES ONLY

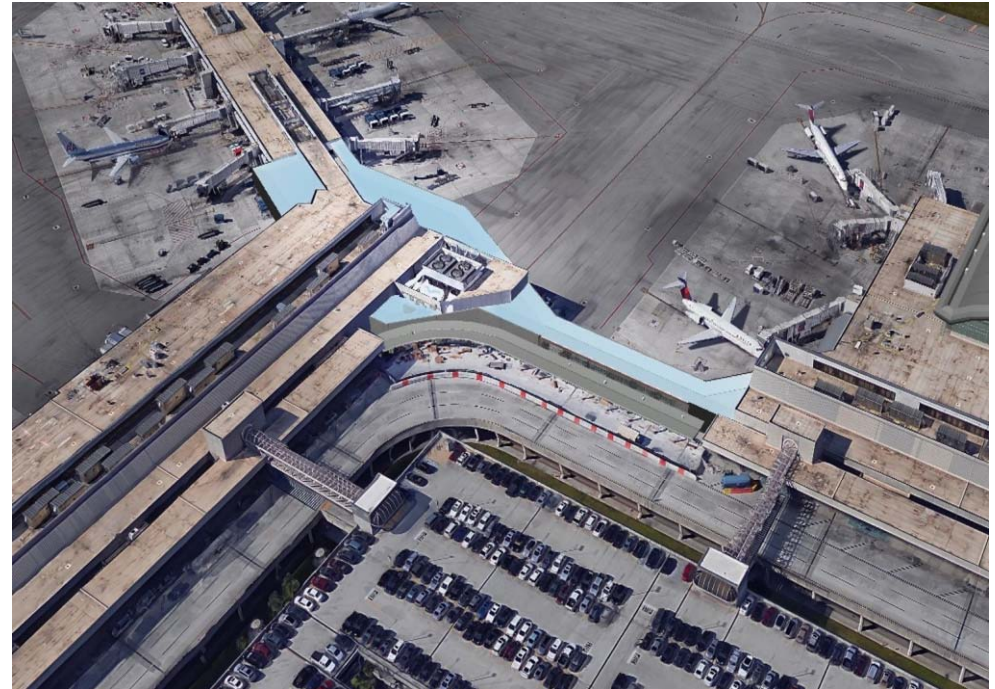
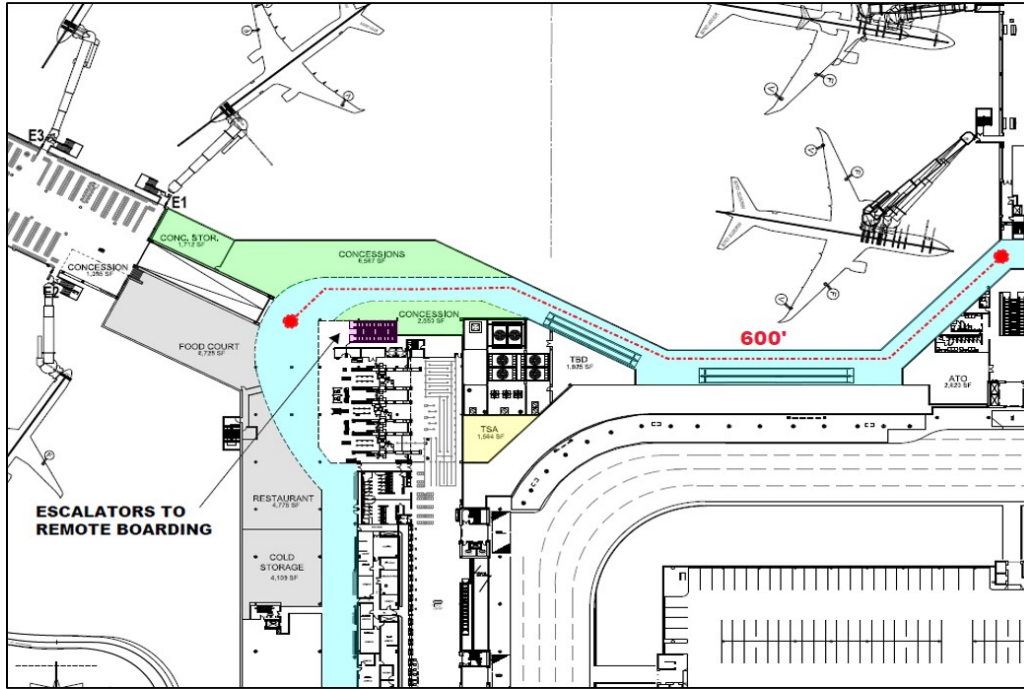




# Terminal Connection Plan

## Proposed T2-T3 Connector Concept

(PRELIMINARY DRAFT) WORK IN PROGRESS - FOR DISCUSSION PURPOSES ONLY



# Additional Terminal Improvements under consideration

- Temporary terminal facility for additional gates
- Terminal 4 ticket lobby and baggage claim expansion / modernization
- Terminal 3 / Terminal 4 connector building (pre-security)

## Temporary Terminal Facility Illustrative Example





# Master Plan Concepts for Serving Demand through 2035

## Terminal & Landside

# Terminal

# Terminal Development Planning Guidelines

- Baseline conditions assume 66 gates
- The EIS Record of Decision for the South Runway Program includes consideration of the expansion of gates up to 77
- Terminal Development Alternatives propose the following incremental phasing:
  - Phase 1: 77 gate build out
  - Phase 2/3: 83-85 gate build out
  - Ultimate Phase: 95 gate build out
- Goal of each incremental phase is to provide additional gate capacity while replacing older facilities with minimal operational impacts



# Terminal Development Concepts

LEGEND

 Short-Listed Concepts

Phase 1

Phase 2A

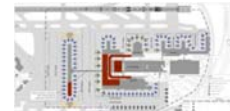
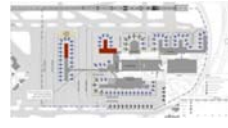
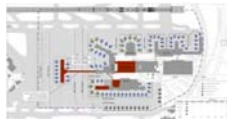
Phase 2B

Phase 3A

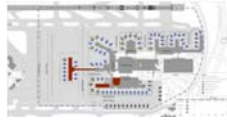
Phase 3B

Ultimate

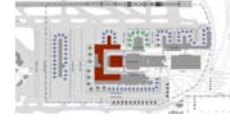
Satellite  
Pier Opt 1



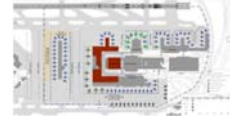
Satellite  
Pier Opt 2



Satellite  
Pier Opt 3



Satellite  
Pier Opt 4



# Terminal Development Concepts

LEGEND

 Short-Listed Concepts

Phase 1

Phase 2A

Phase 2B

Phase 3A

Phase 3B

Ultimate

Satellite  
Pier Opt 5A



Satellite  
Pier Opt 5B



Satellite  
Pier Opt 6



T4 East  
Extension



T4 West  
Extension



# Screening Matrix for Terminal Development Concepts

Screening Criteria	Satellite Option 1	Satellite Option 2	Satellite Option 3	Satellite Option 4	Satellite Option 5	Satellite Option 6	T4 East Extension	T4 West Extension
Capacity Benefits	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Does not Meet Criteria	Does not Meet Criteria
Operational Considerations and Flexibility	Meets Criteria	Partly Meets Criteria	Does not Meet Criteria	Does not Meet Criteria	Meets Criteria	Meets Criteria	Partly Meets Criteria	Meets Criteria
Incremental Development Potential	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Partly Meets Criteria	Meets Criteria
Constructability	Meets Criteria	Meets Criteria	Partly Meets Criteria	Partly Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria
Relative (to other Alternatives) Costs	Partly Meets Criteria	Partly Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Partly Meets Criteria	Meets Criteria
Future Expansion Potential	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria	Does not Meet Criteria	Does not Meet Criteria

**LEGEND:**

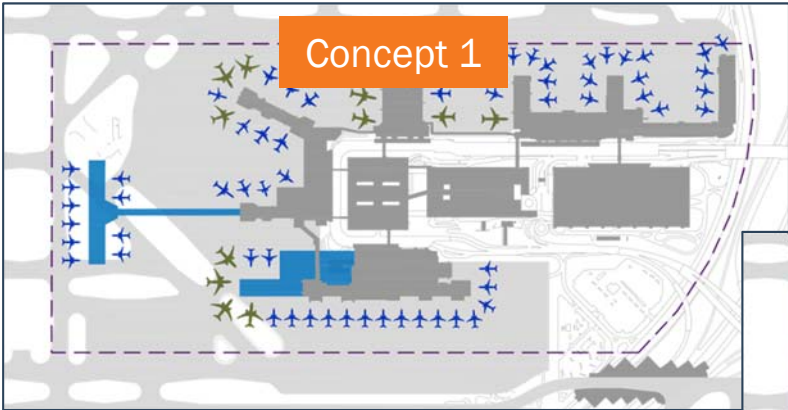
- Meets Criteria
- Partly Meets Criteria
- Does not Meet Criteria
- Short-listed Concepts



# Short Listed Terminal Concepts

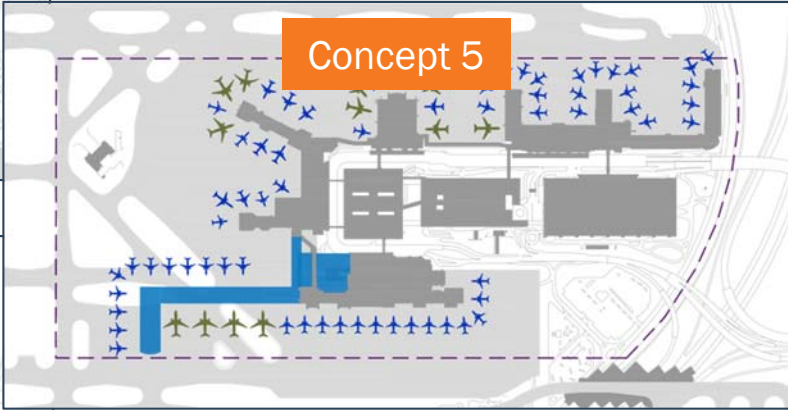
(PRELIMINARY DRAFT) WORK IN PROGRESS - FOR DISCUSSION PURPOSES ONLY

## Phase 1 Development (77 Gate Complex)

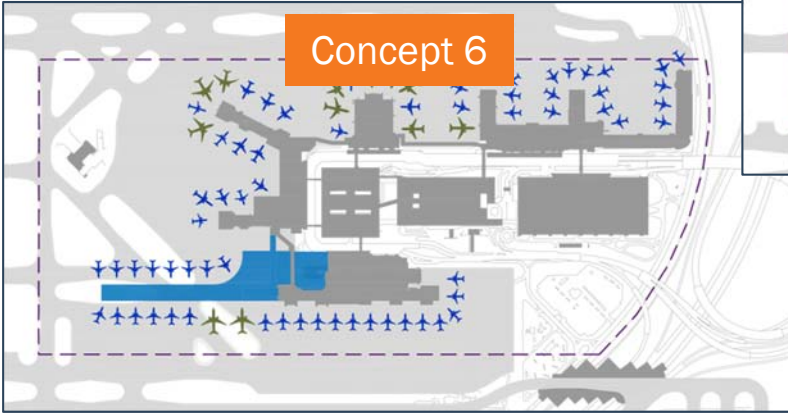


Concept 1

Short-listed (from those considered):  
Develop mid-field Concourse and/or  
Expand Concourse G to the west





Concept 5



Concept 6

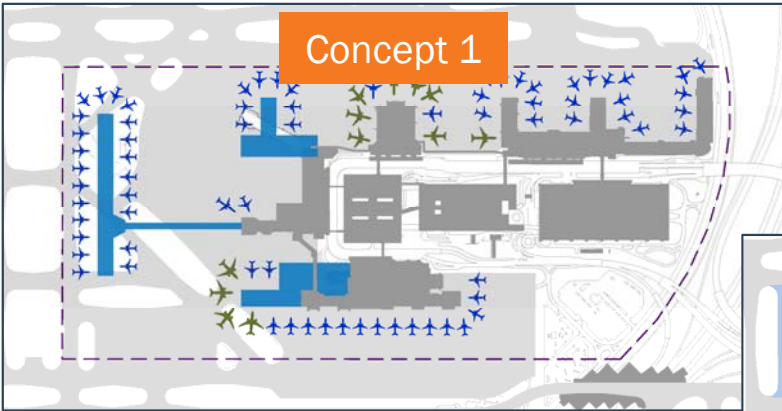
Note: New south side gates in Concourse G West extension in Concepts 5 & 6 are anticipated to be NB/WB capable that would serve as domestic/international swing gates.

-  Narrowbody Gate
-  Widebody Gate

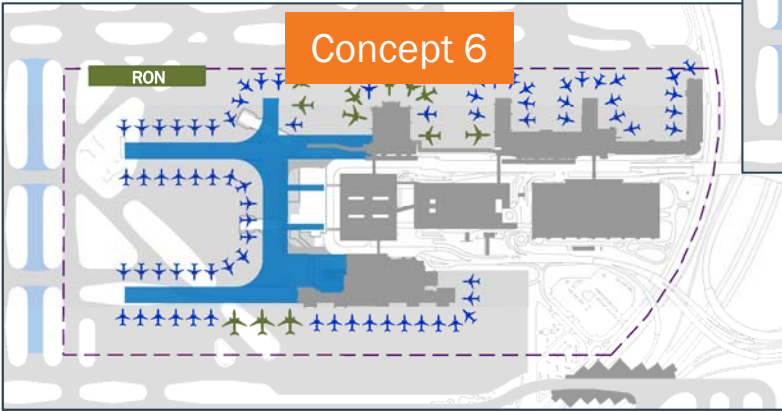
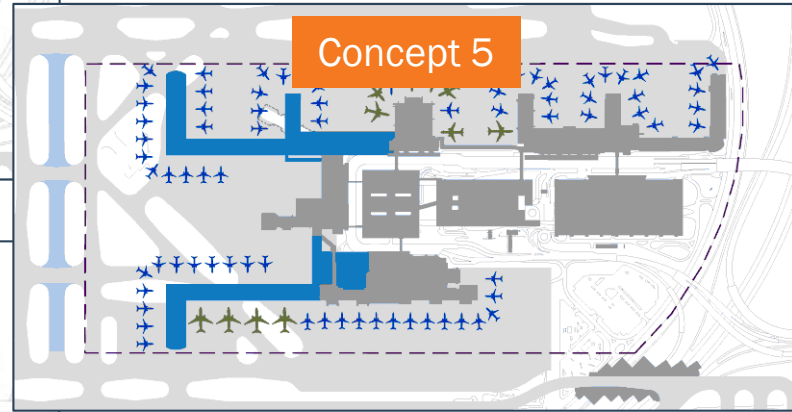
# Short Listed Terminal Concepts

(PRELIMINARY DRAFT) WORK IN PROGRESS - FOR DISCUSSION PURPOSES ONLY

## Phase 2/3 Development (83 - 85 Gate Complex)



Short-listed (from those considered):  
Develop mid-field Concourse and/or  
Expand Concourse G to the west



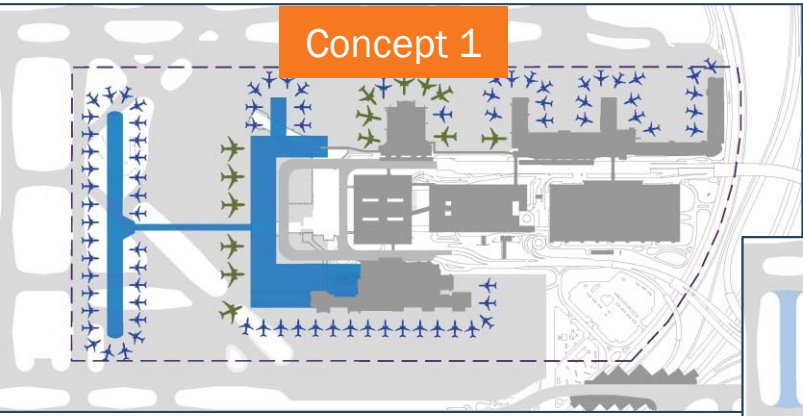
Note: New south side gates in Concourse G West extension in Concepts 5 & 6 are anticipated to be NB/WB capable that would serve as domestic/international swing gates.

-  Narrowbody Gate
-  Widebody Gate

# Short Listed Terminal Concepts

(PRELIMINARY DRAFT) WORK IN PROGRESS - FOR DISCUSSION PURPOSES ONLY

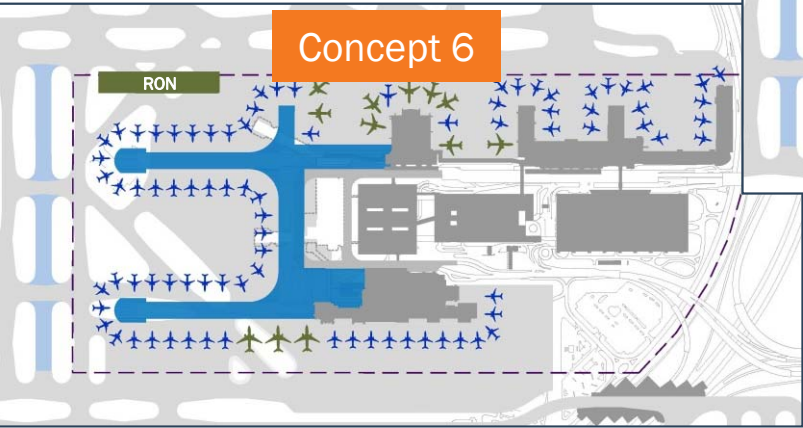
## Ultimate Phase (Post 2035) Development (95 Gate Complex)



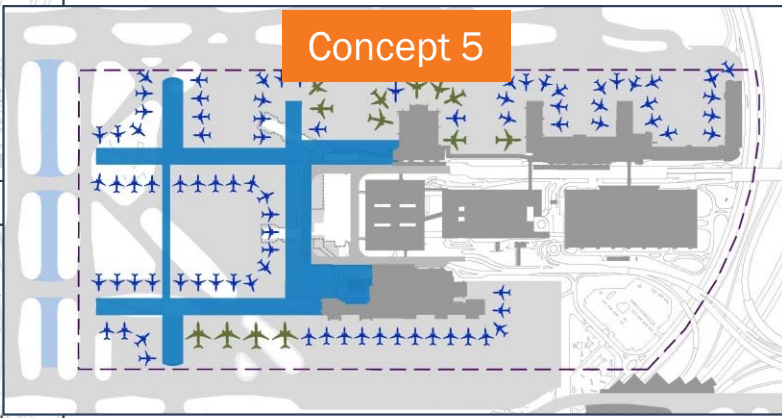
Concept 1

Short-listed (from those considered):  
Develop mid-field Concourse and/or  
Expand Concourse G to the west

Targets balance with practical  
airfield capacity



Concept 6



Concept 5

Note: New south side gates in Concourse G West extension in Concepts 5 & 6 are anticipated to be NB/WB capable that would serve as domestic/international swing gates.

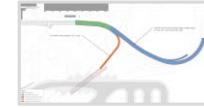
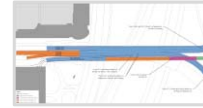
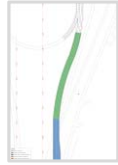
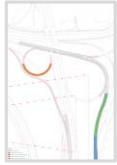
-  Narrowbody Gate
-  Widebody Gate



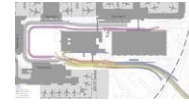
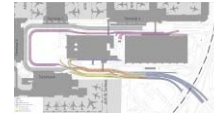
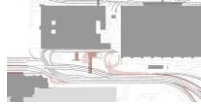
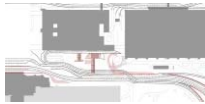
# Landside

# Range of Landside Concepts Considered

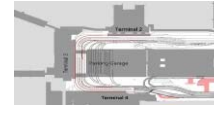
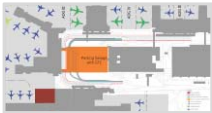
Ingress/  
Egress



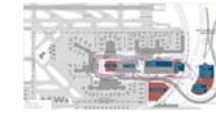
Terminal  
Roadway



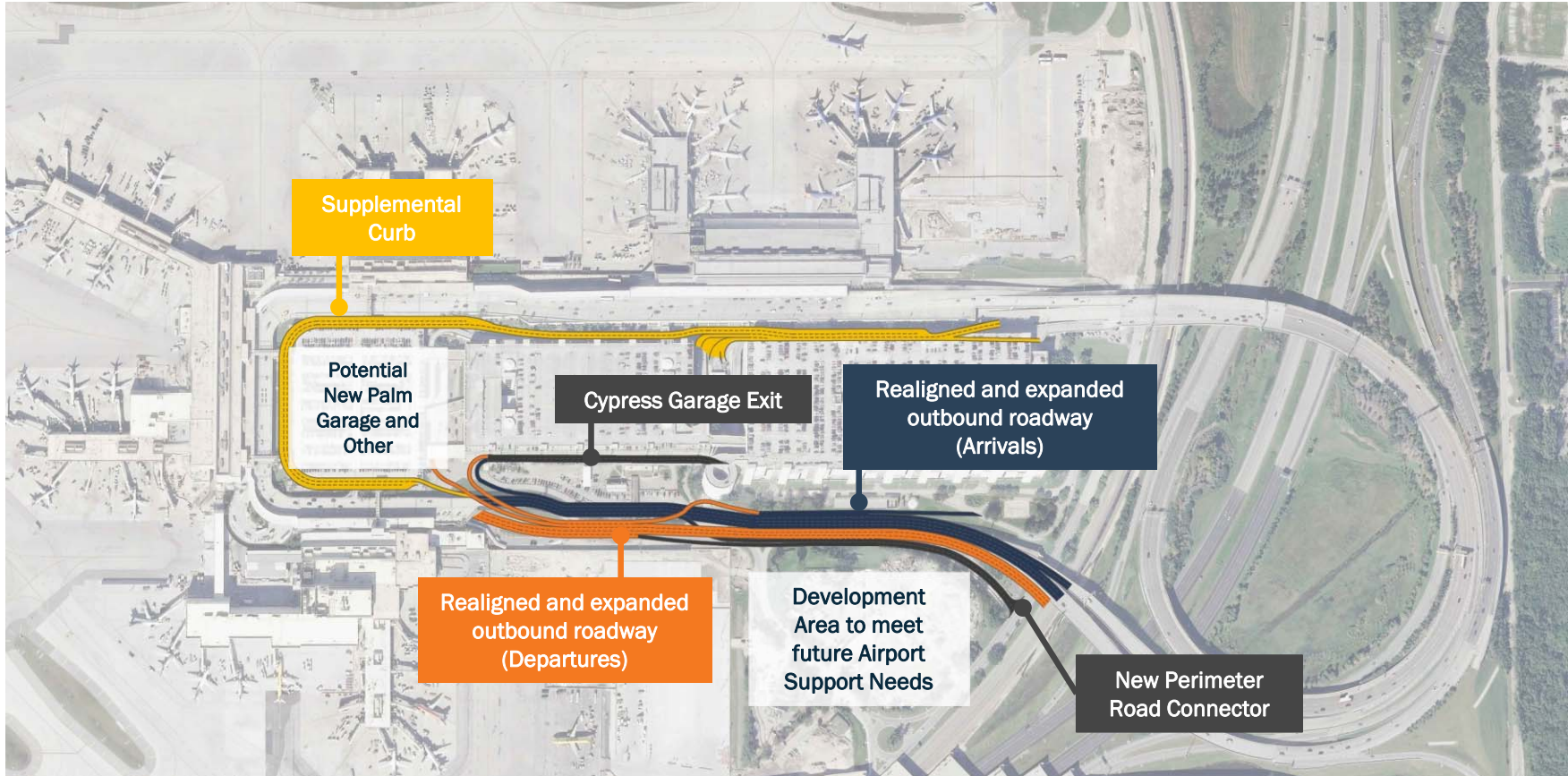
Terminal  
Curb



Parking  
and Rental  
Car  
Facilities

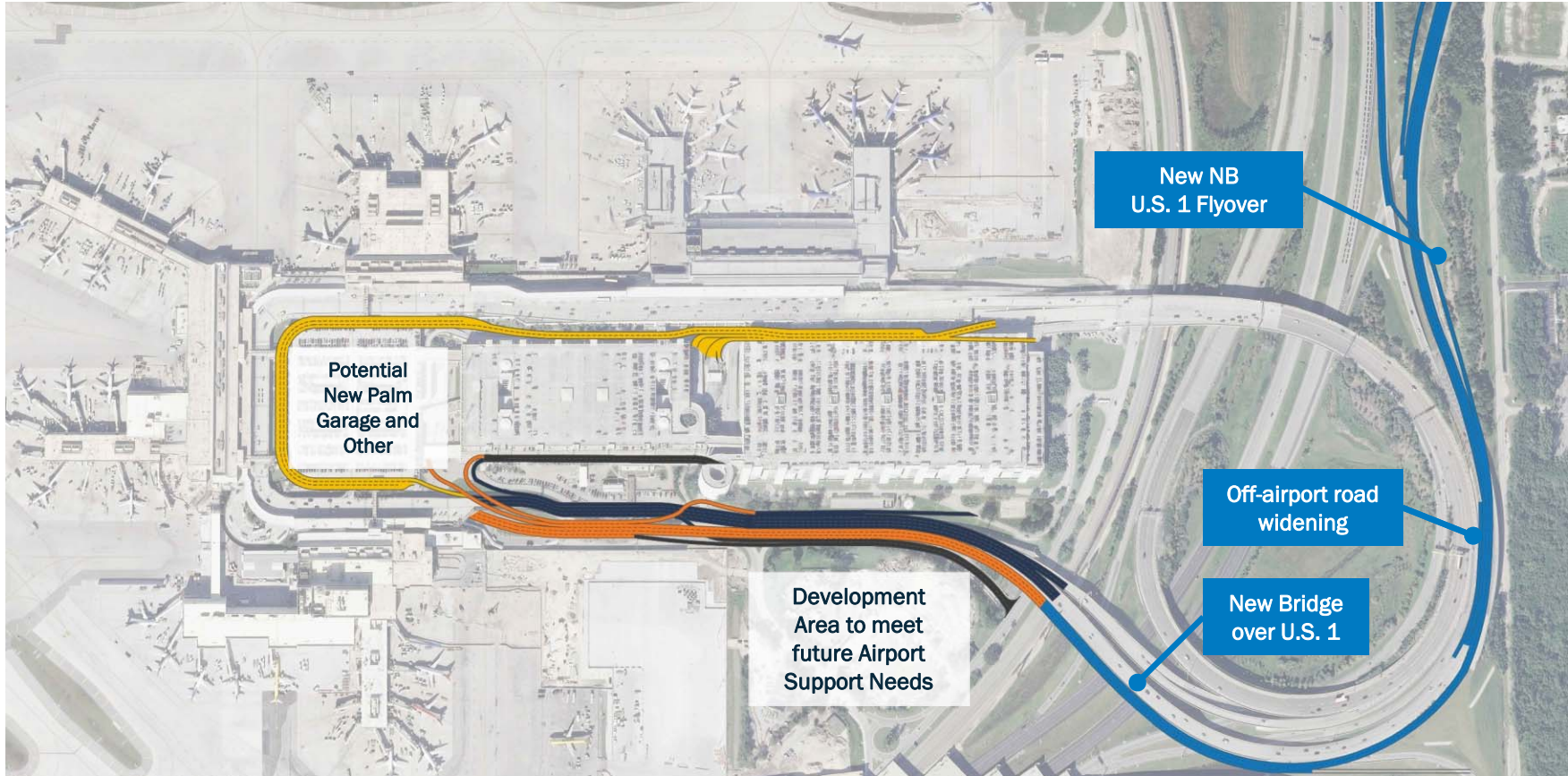


# Preliminary Terminal Curbside and Roadway Expansion Alternative On-Airport Improvements





# Preliminary Terminal Curbside and Roadway Expansion Alternative With Off-Airport Improvements





# Examples of Automated People Mover Systems (APM)

Tampa International Airport

Miami International Airport

Orlando International Airport

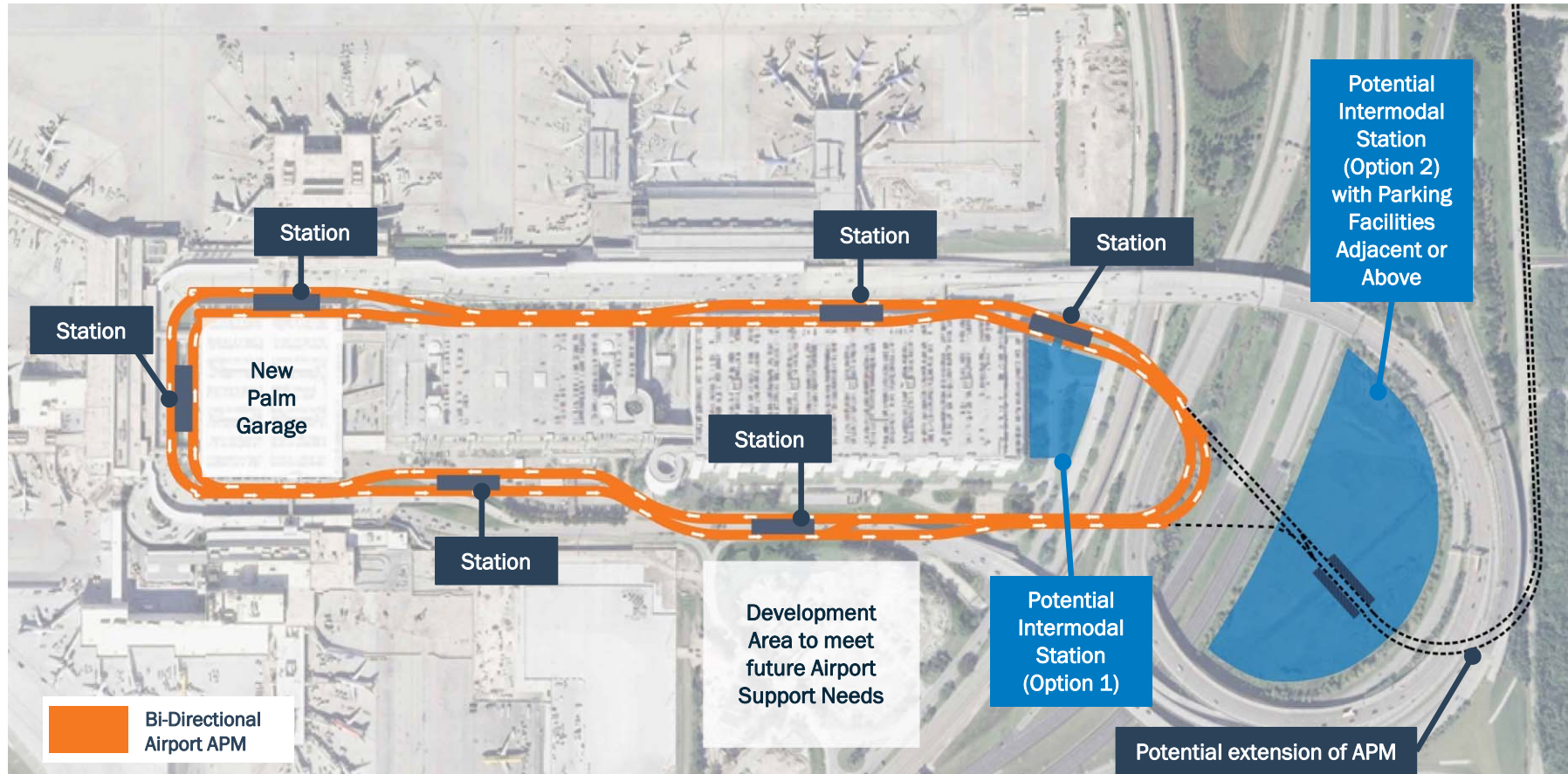
Existing



Proposed



# Preliminary Automated People Mover (APM) Concept



## Next Steps



# Next Steps

- Complete the current Terminal Modernization Program
- Continue work on short-term improvements; return to Board for approval
- Stakeholder engagement and meetings
- Complete identification of Airport-wide needs (full Airport campus to include cargo, business/general aviation, ancillary/support facilities etc.)
- Further refinement to future development concepts
- Continuation with subsequent master planning tasks





FORT LAUDERDALE-HOLLYWOOD  
INTERNATIONAL AIRPORT  
BROWARD COUNTY, FLORIDA

THANK YOU



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