



FORT LAUDERDALE-HOLLYWOOD
INTERNATIONAL AIRPORT

BROWARD COUNTY, FLORIDA

Airport Preliminary Master Plan Workshop
Board of County Commissioners
April 18, 2017



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



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
 - Stakeholder Engagement and Public Outreach

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

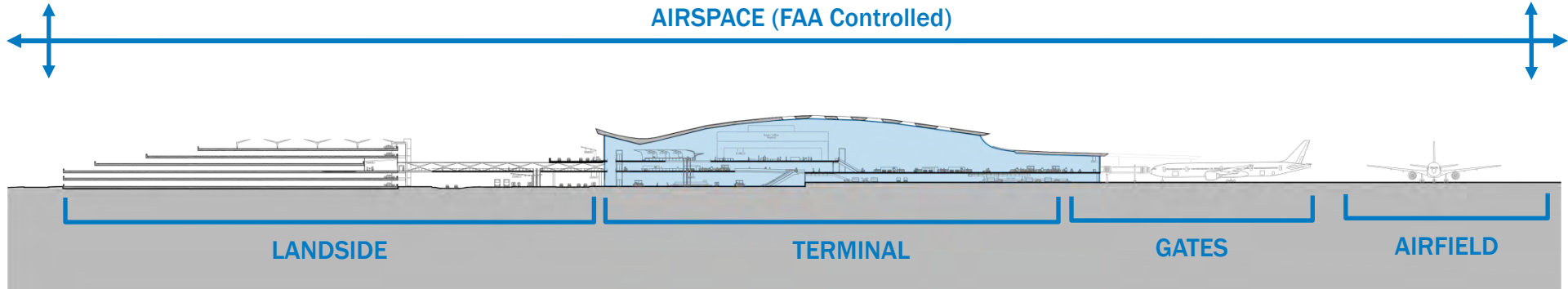
OPTIMIZE – Land Assets and Recent Investments

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



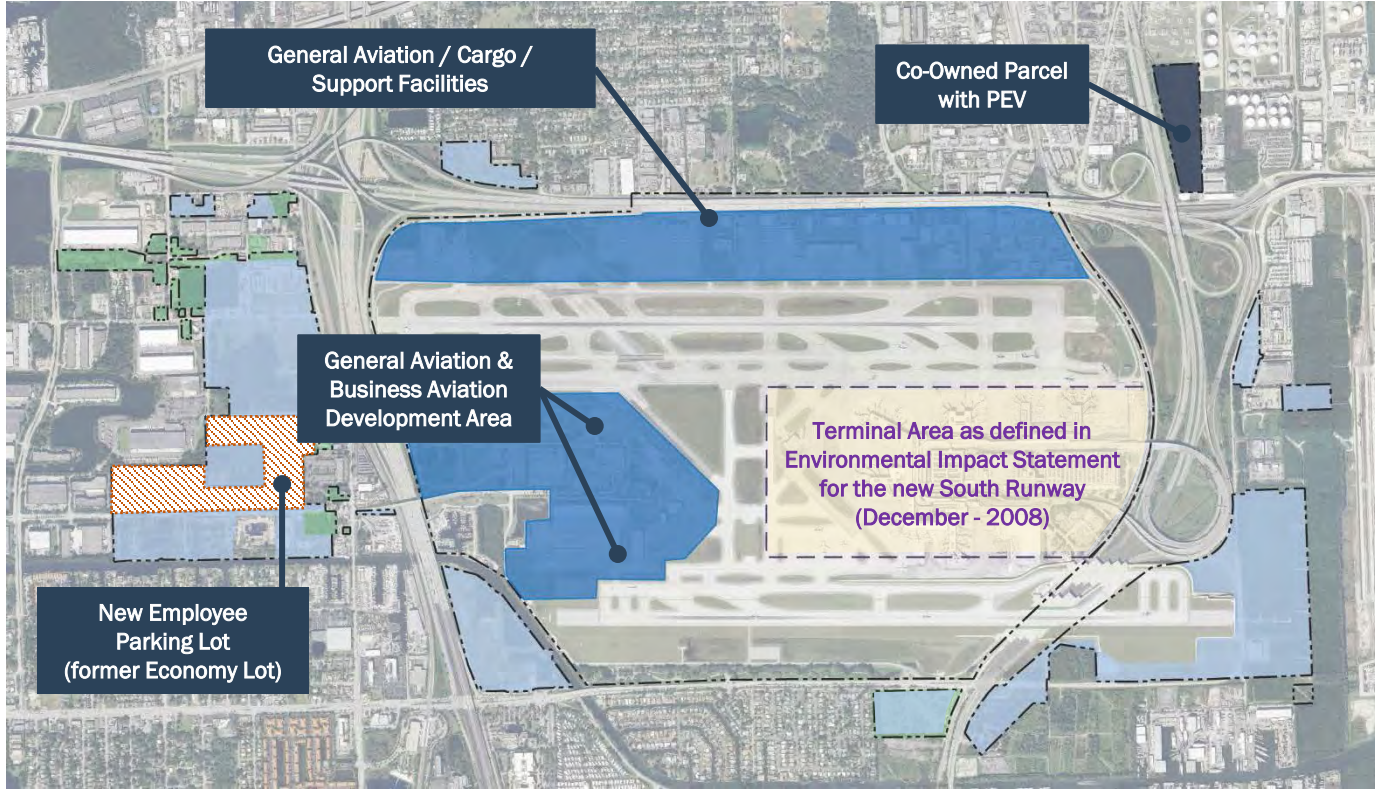
Sequence of Master Planning Tasks





Baseline Conditions / Today's Environment

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

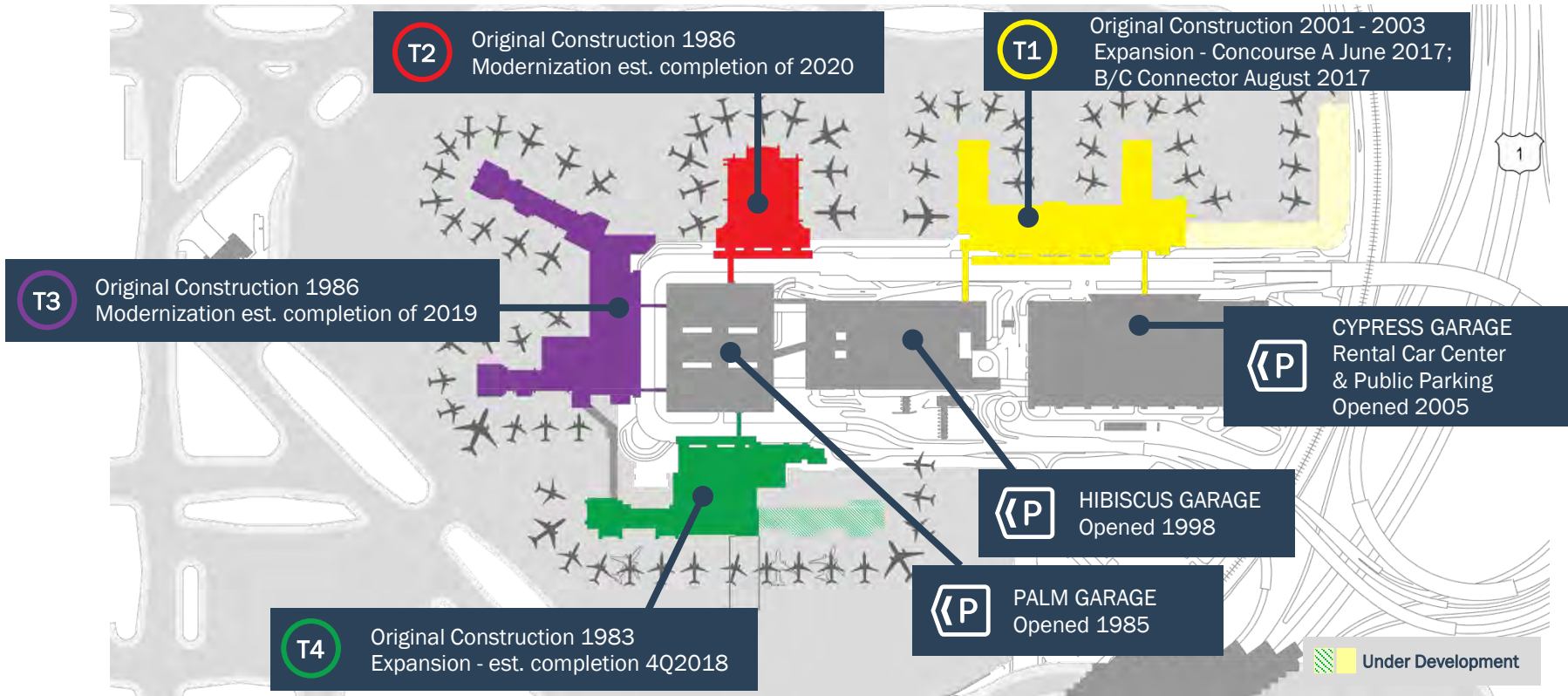
FLL Baseline Conditions – Land Assets & General Uses



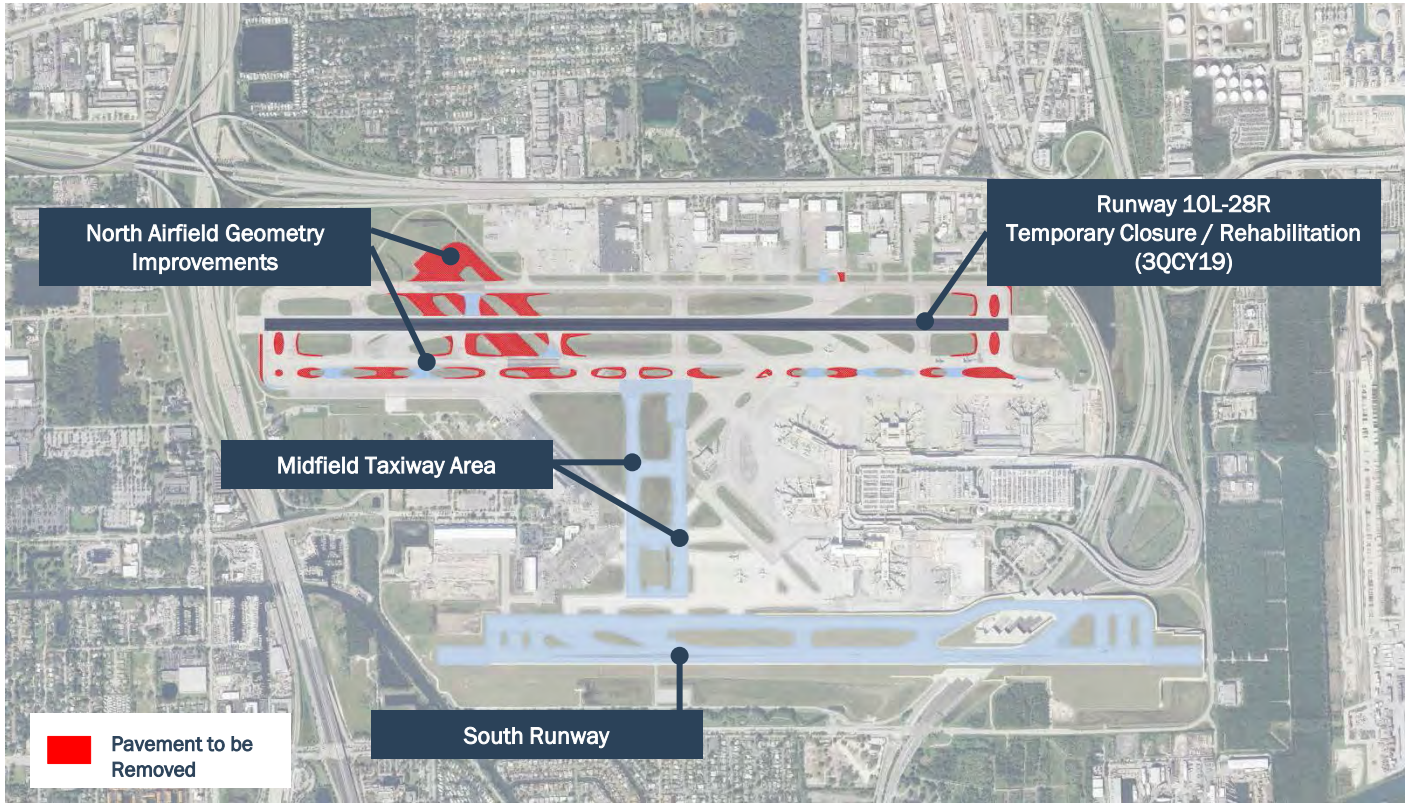
Legend:

-  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



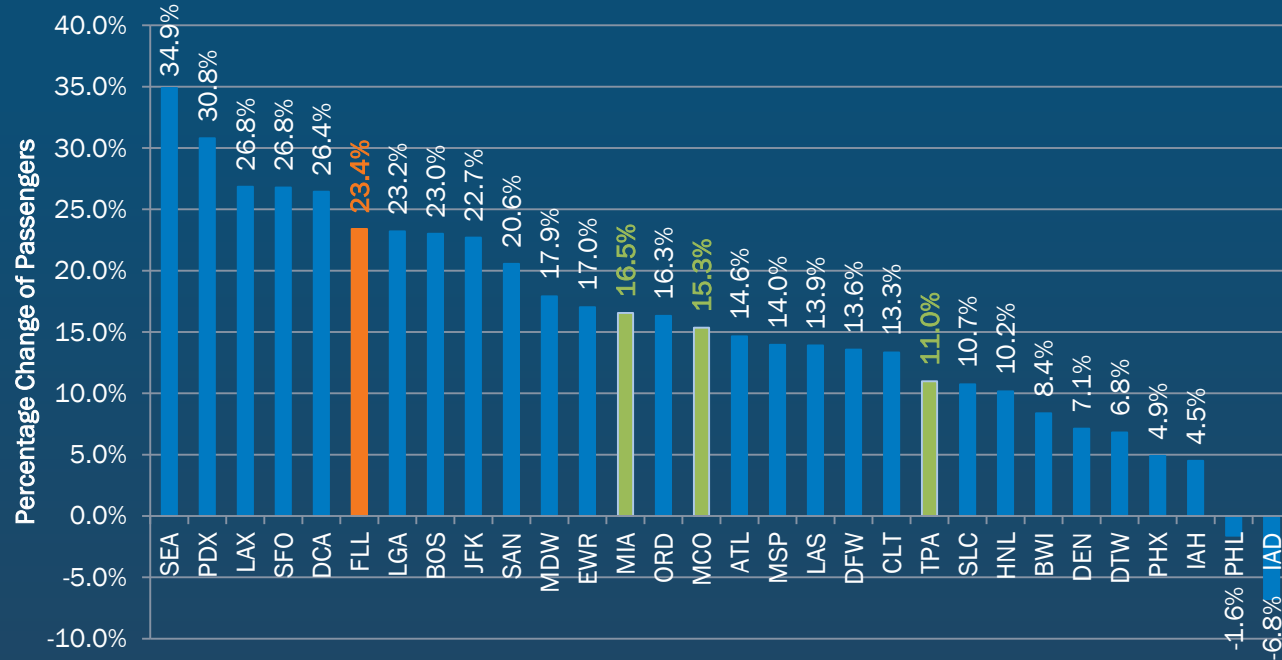
Baseline Conditions assume:

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

FLL Baseline Conditions

Passenger Growth FY11 – FY16

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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%

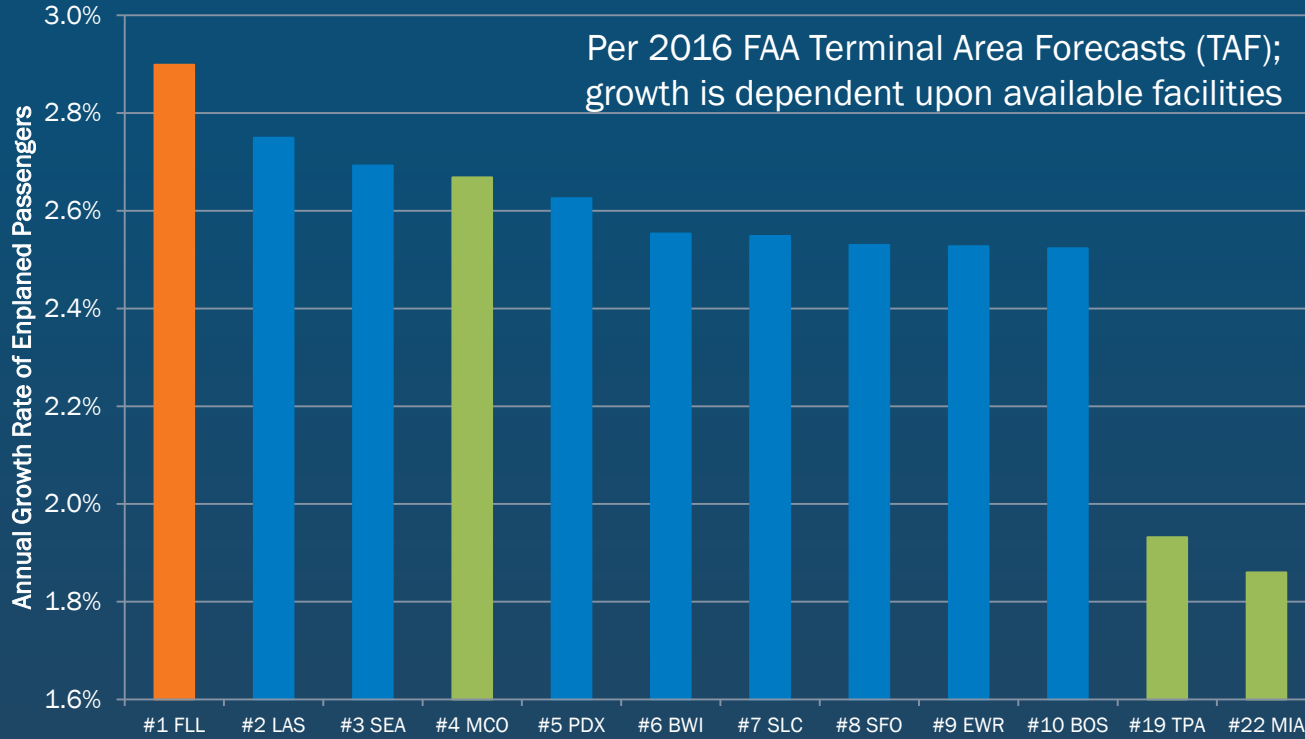
Fiscal Year (FY) represents October 1st – September 30th

Aviation Activity Forecasts

Approved by FAA: January 13, 2017

Activity Forecasts

Projected Growth – FY2016 - 2035



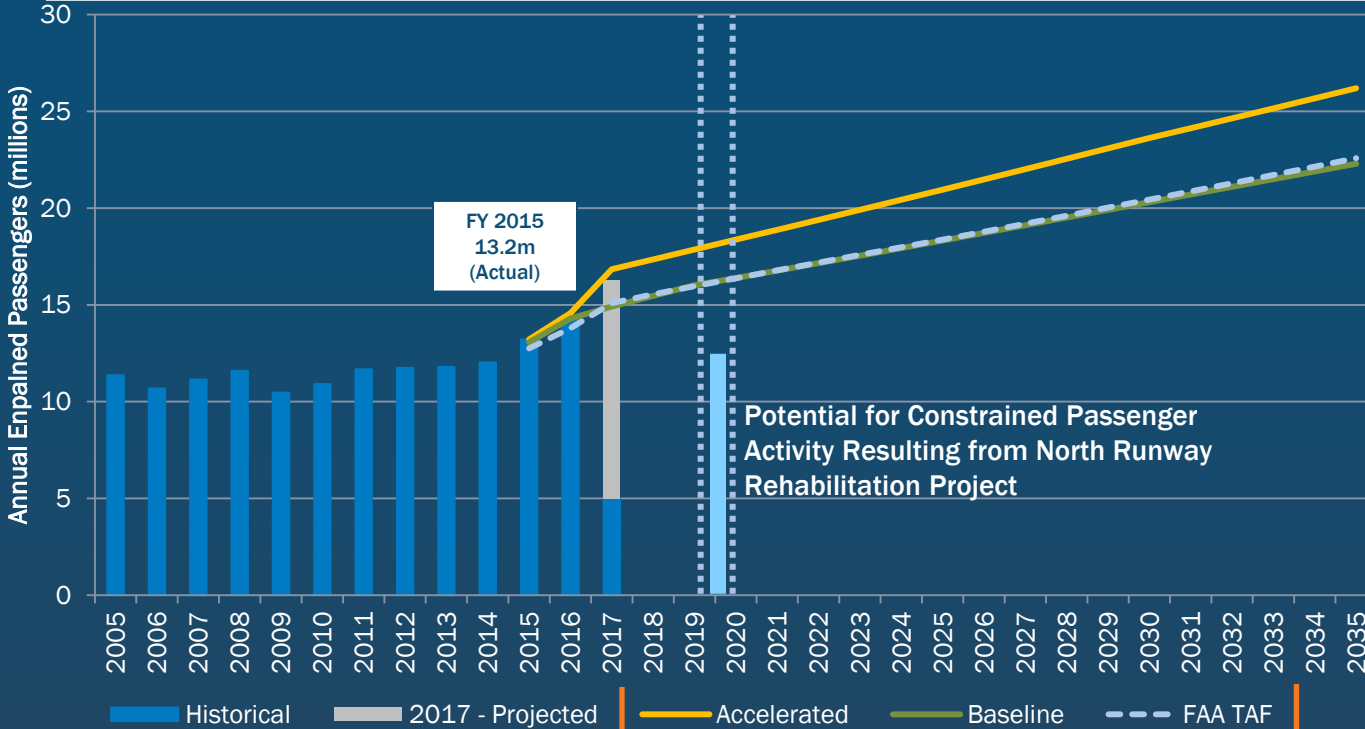
NOTES: Data represents revenue enplaned passengers at U.S. Large Hub Airports and is sorted (largest to smallest) based on compound annual growth rates for the period noted. The top 10 airports (as well as MIA and TPA) are shown.

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.

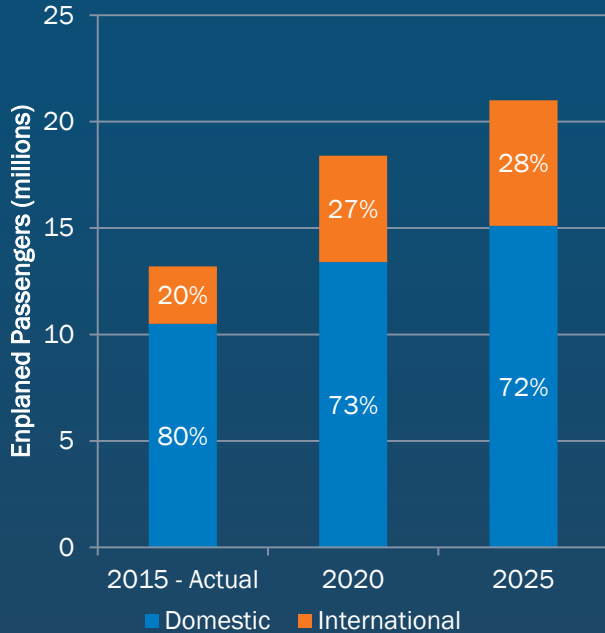
SOURCES: Broward County Aviation Department (Historical); US DOT T100; Innovata; FAA Terminal Area Forecasts; Ricondo & Associates, Inc.

Potential for Constrained Passenger Activity Resulting from North Runway Rehabilitation Project

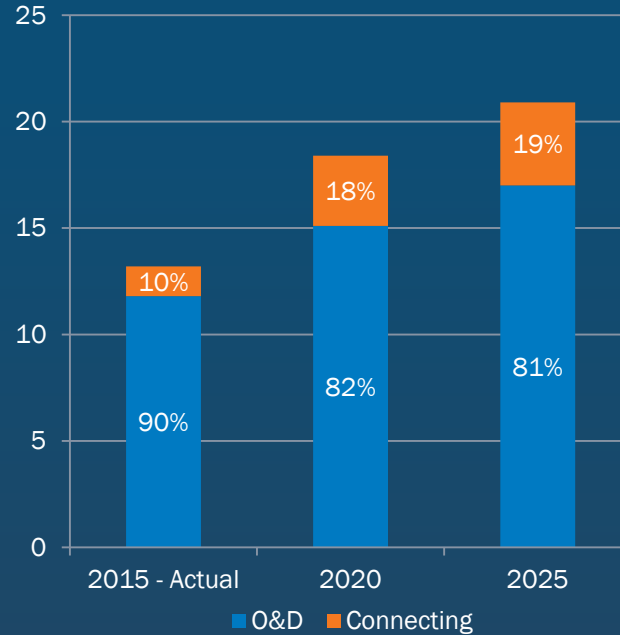
Forecasts

Activity Forecasts – Changing Passenger Demographic

Domestic vs. International



Originating vs. Connecting



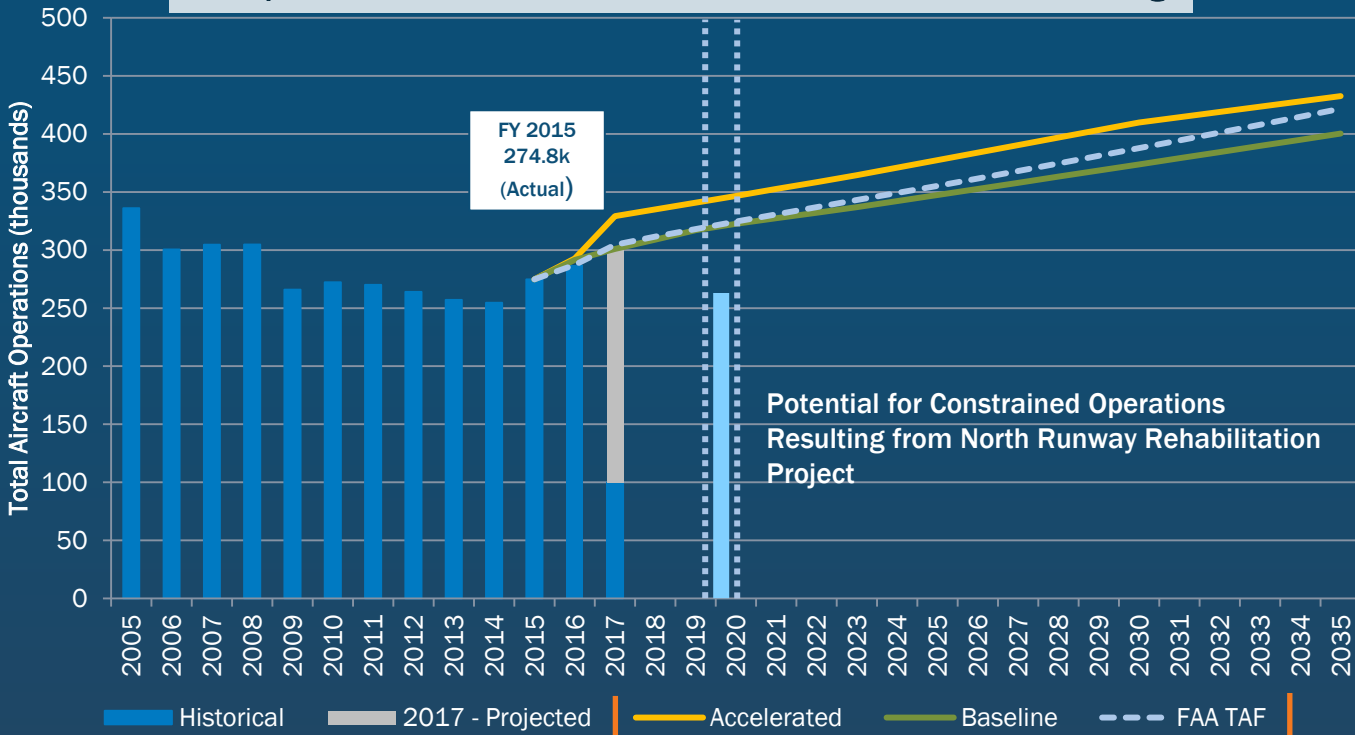
NOTE: Percentages for 2015 represent actual data.

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.

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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

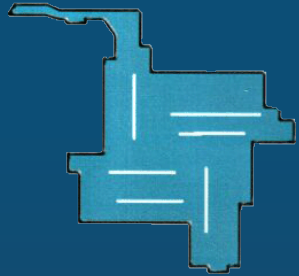
Forecasts

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

Runway 10L-28R

Annual Airfield Capacity: 425,000 – 475,000 operations
(Average delay per operation = 6 – 10 minutes)

Runway 10R-28L

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):

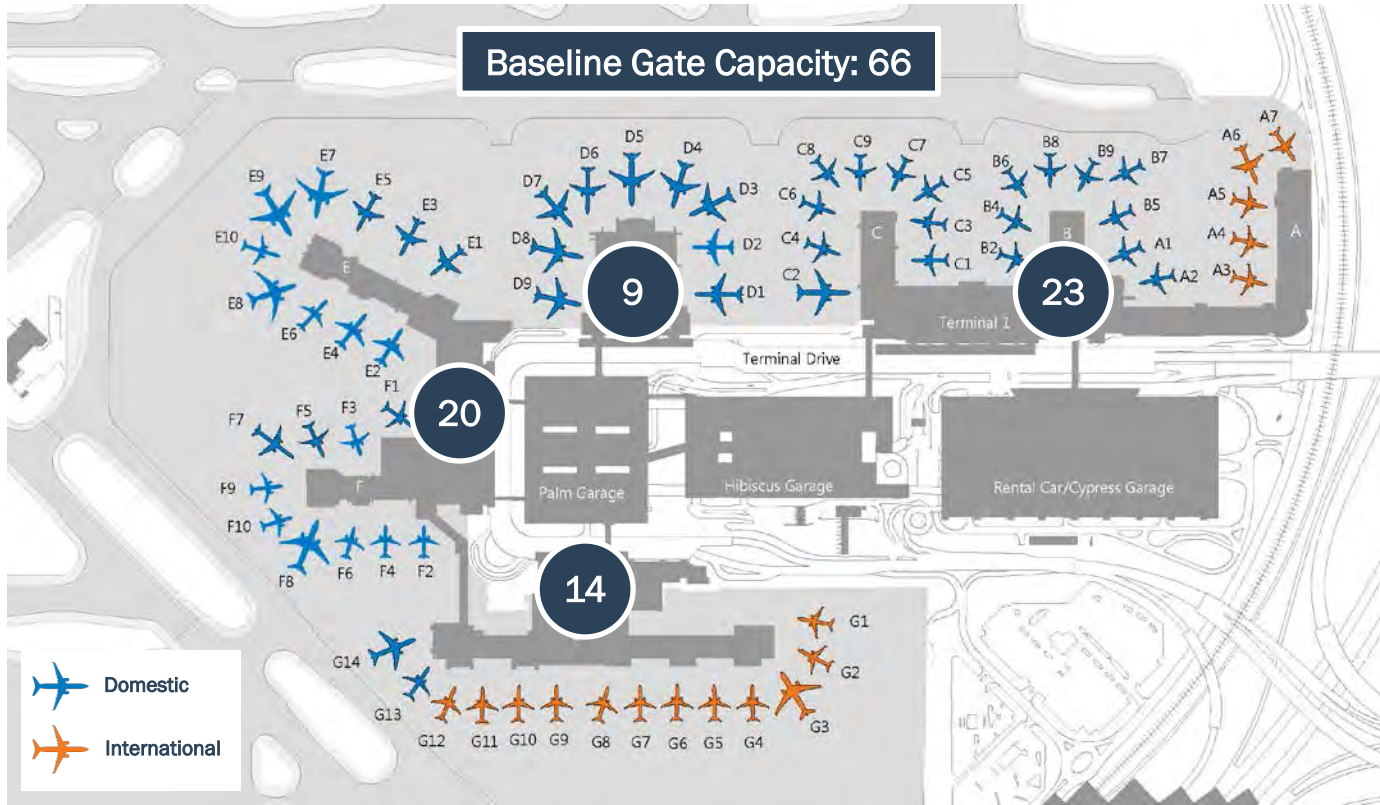
- 347,000 annual operations

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



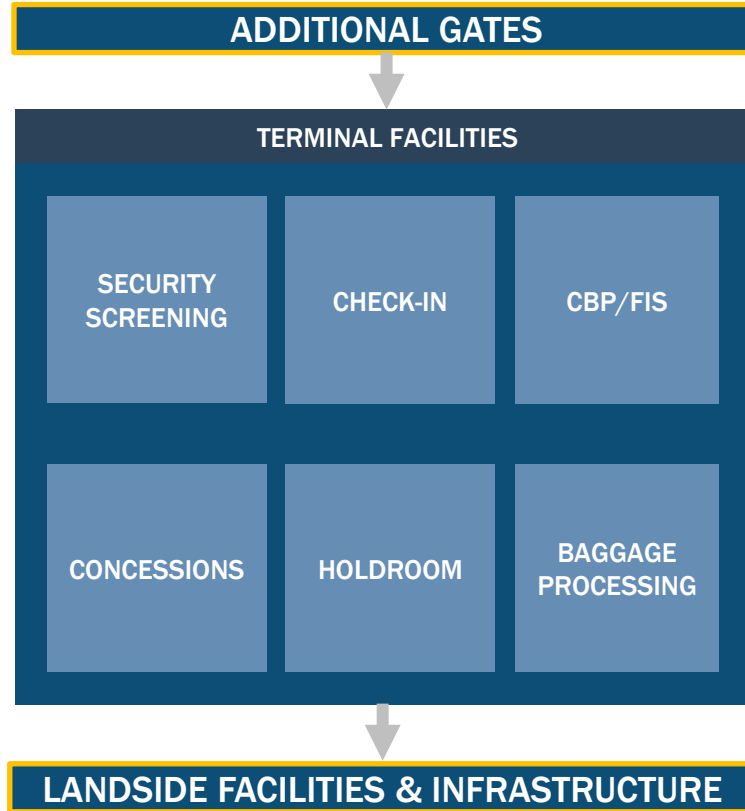
FY2016: 28.7 MAP
CY2016: 29.2 MAP

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

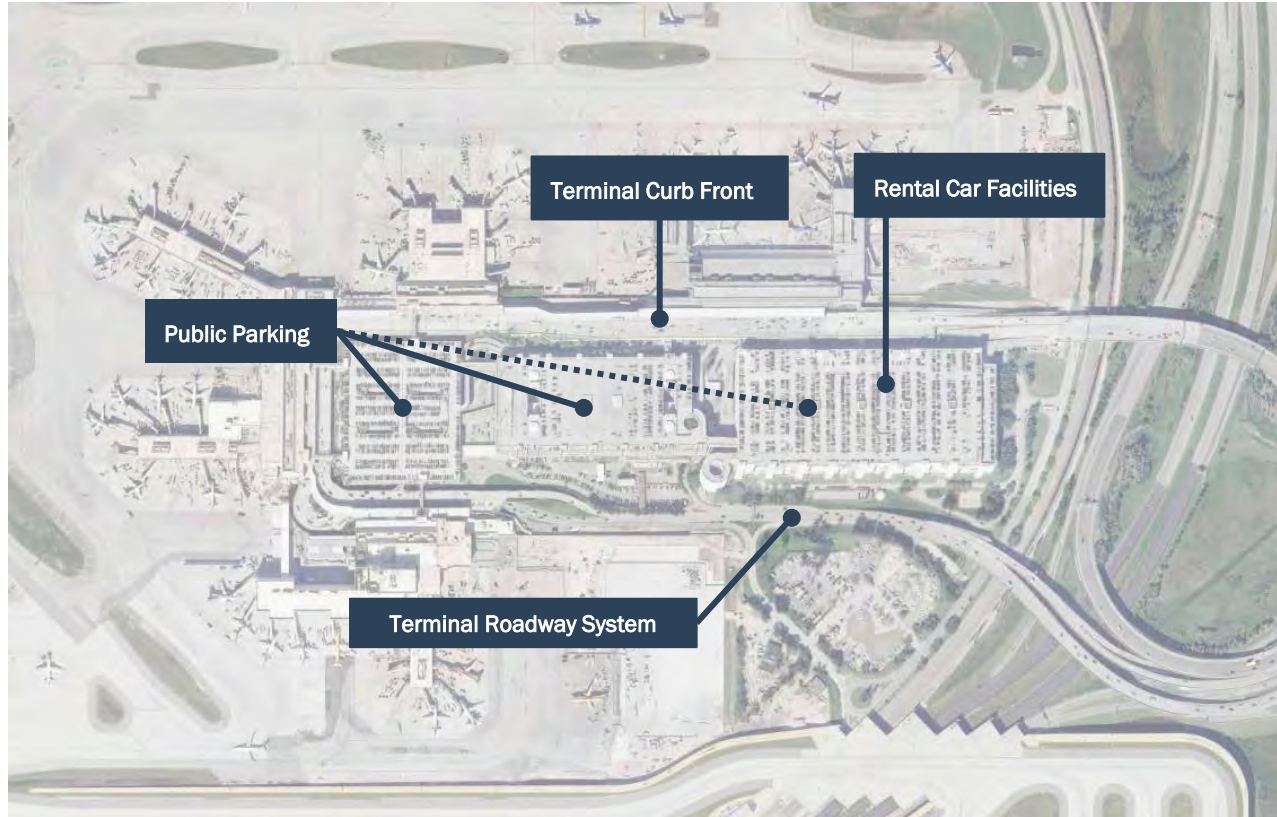
Notes:
MAP: Million Annual Passengers

New Gates Require Terminal Processing Support Functions



Landside

Landside Facilities & Infrastructure



Terminal Curbfront

Level of Service (LOS) Characteristics (Illustrative)



LOS A

Free flow – no interference



LOS B

Relatively free flow – some double parking



LOS C

Double & sometimes triple parking – Planning Conditions



LOS D

Triple parking – Through lanes capacity impacted/reduced



LOS E/F

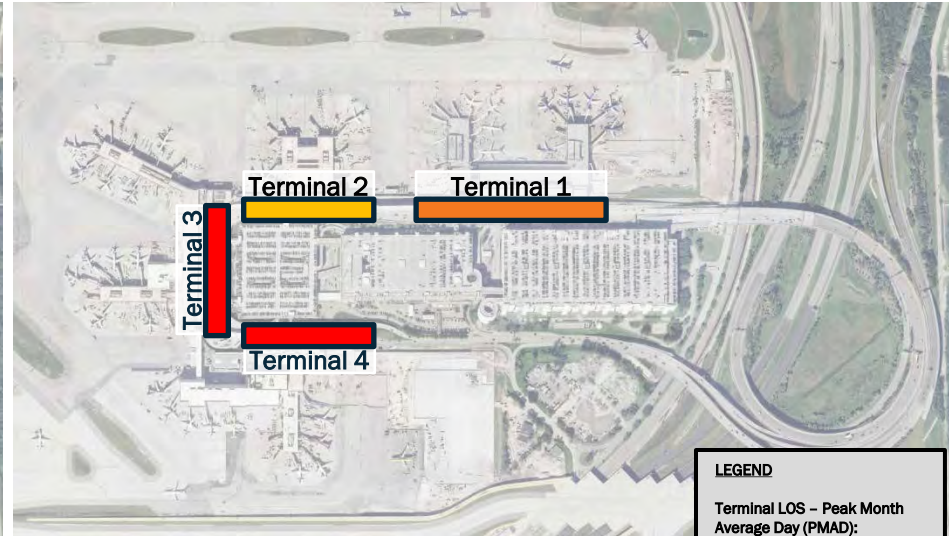
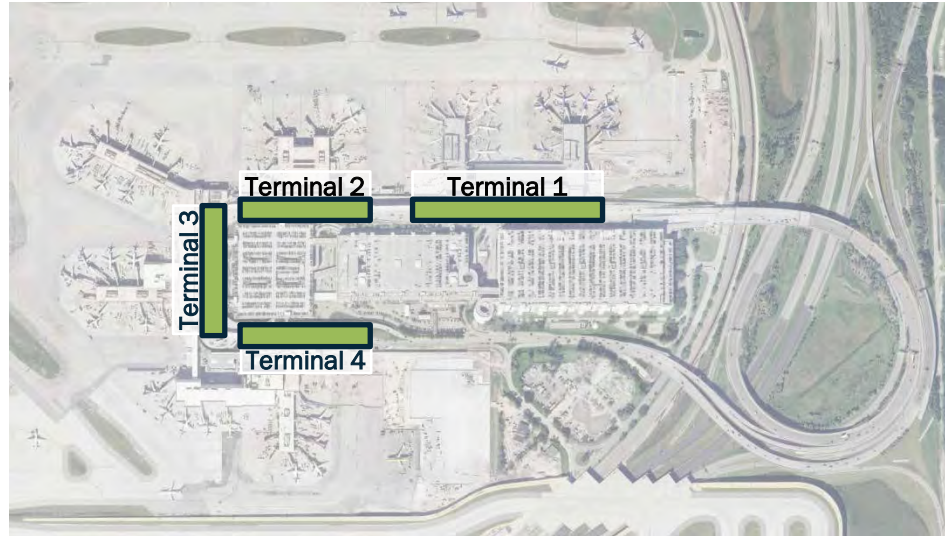
Gridlock – Consistent congestion & delay

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)



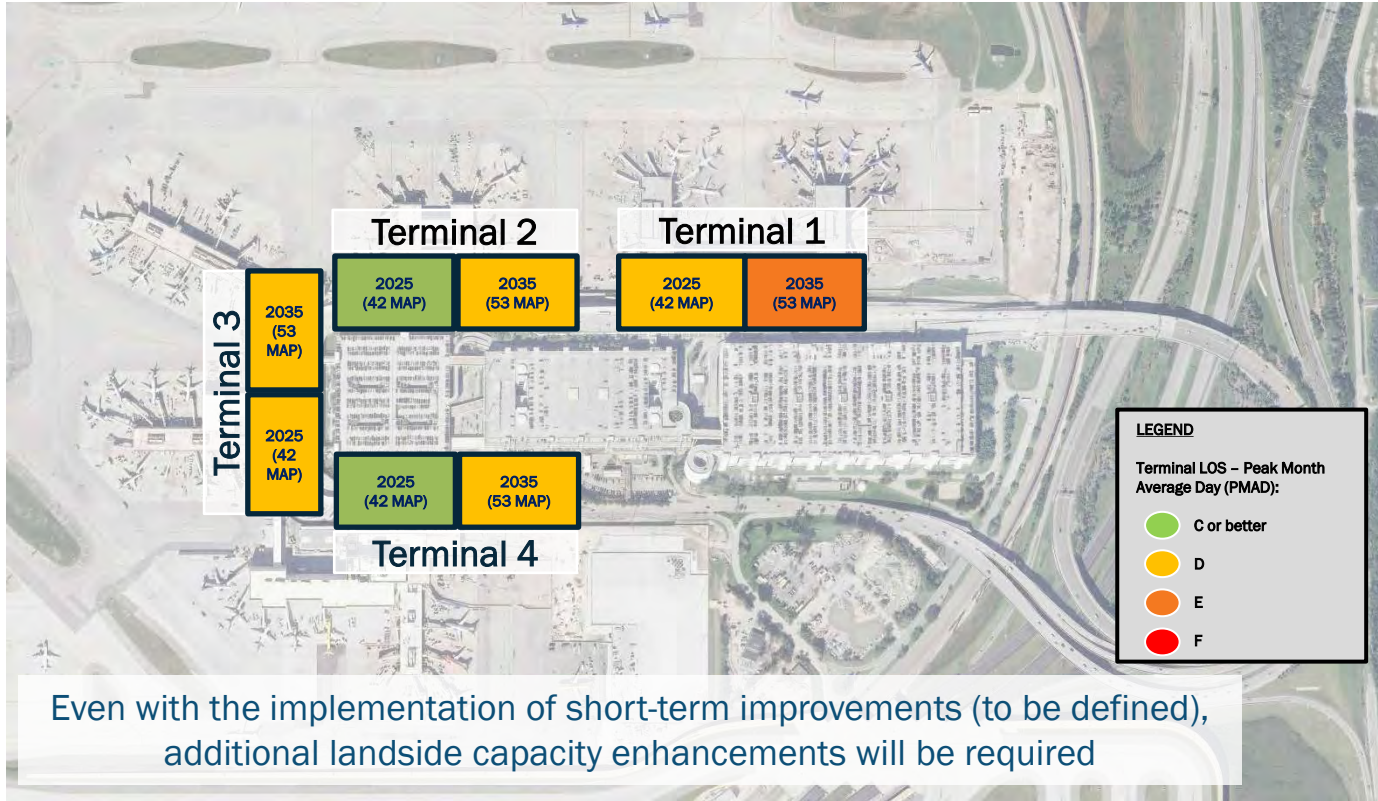
LEGEND

Terminal LOS – Peak Month Average Day (PMAD):

- Green circle: C or better
- Yellow circle: D
- Orange circle: E
- Red circle: F

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

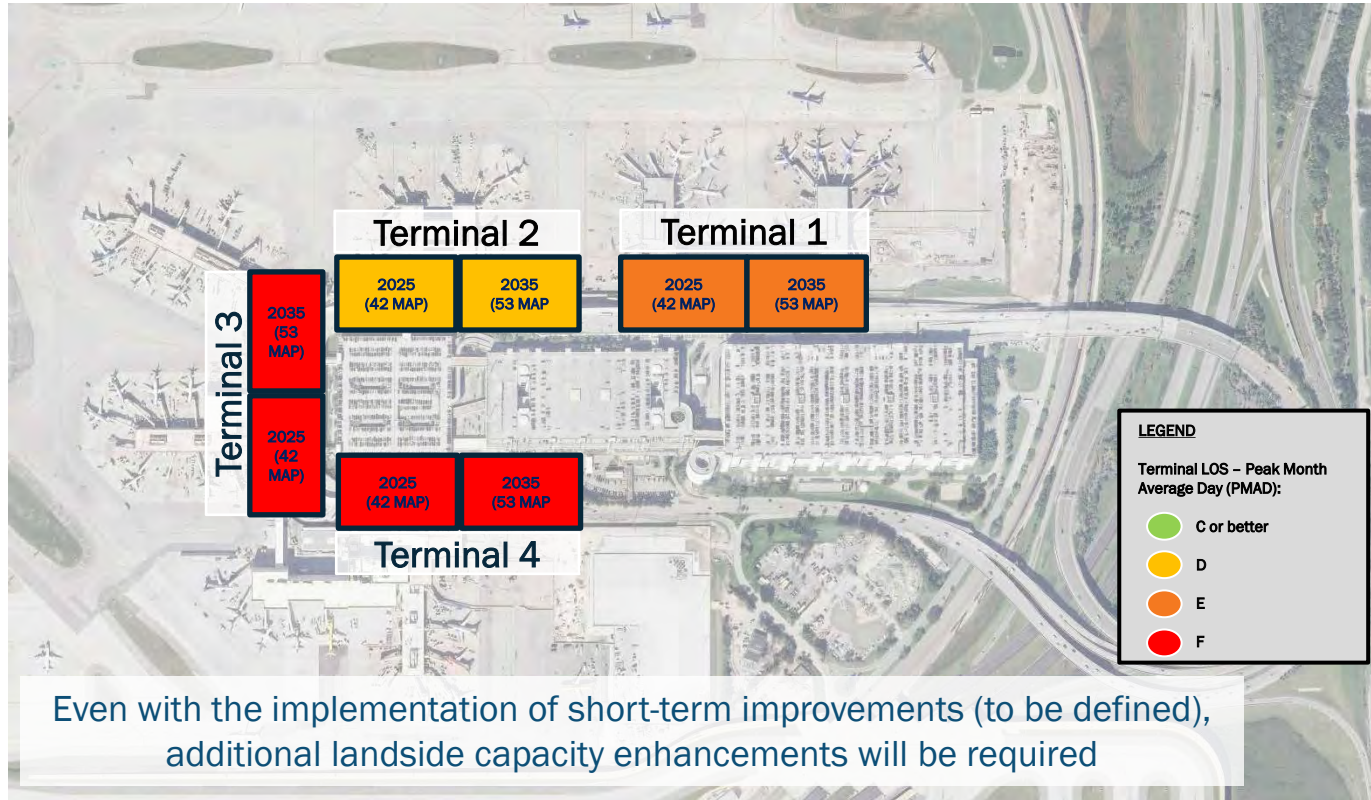
Departures Level Terminal Curbside LOS - Forecast



MAP: Million Annual Passengers

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

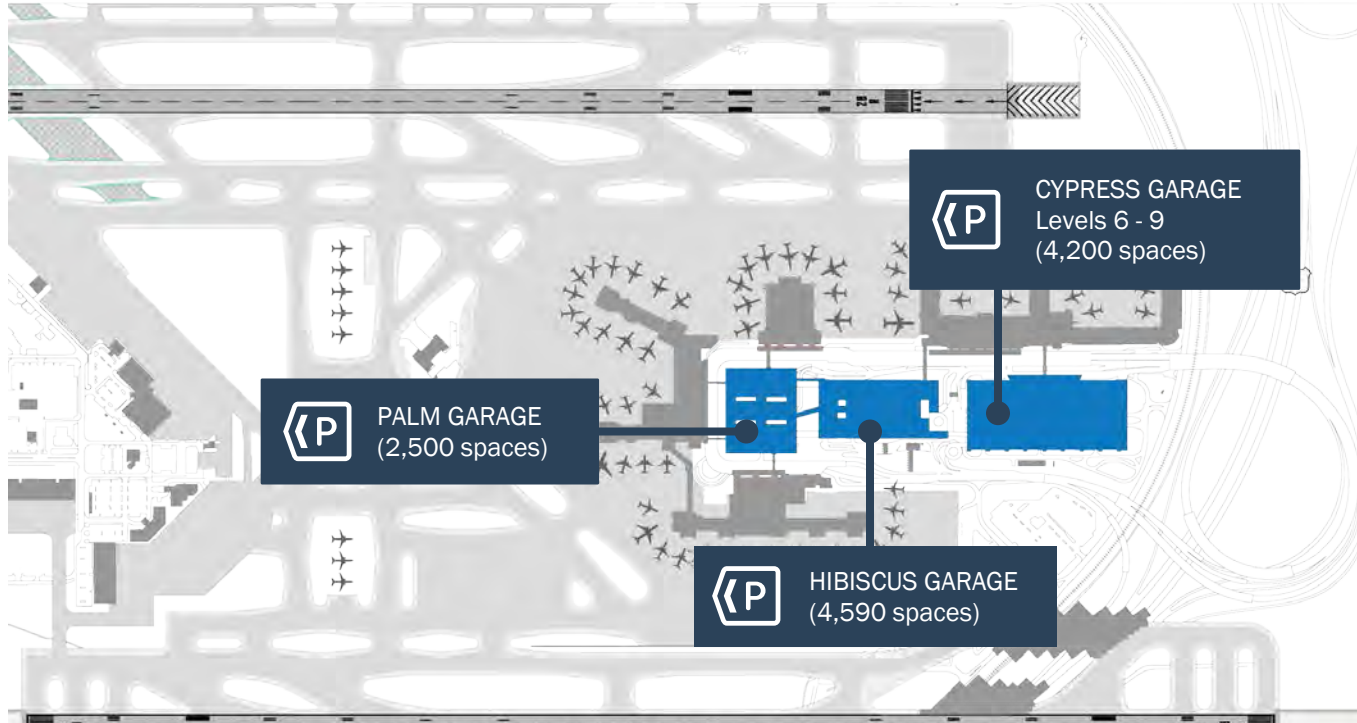


MAP: Million Annual Passengers

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

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**

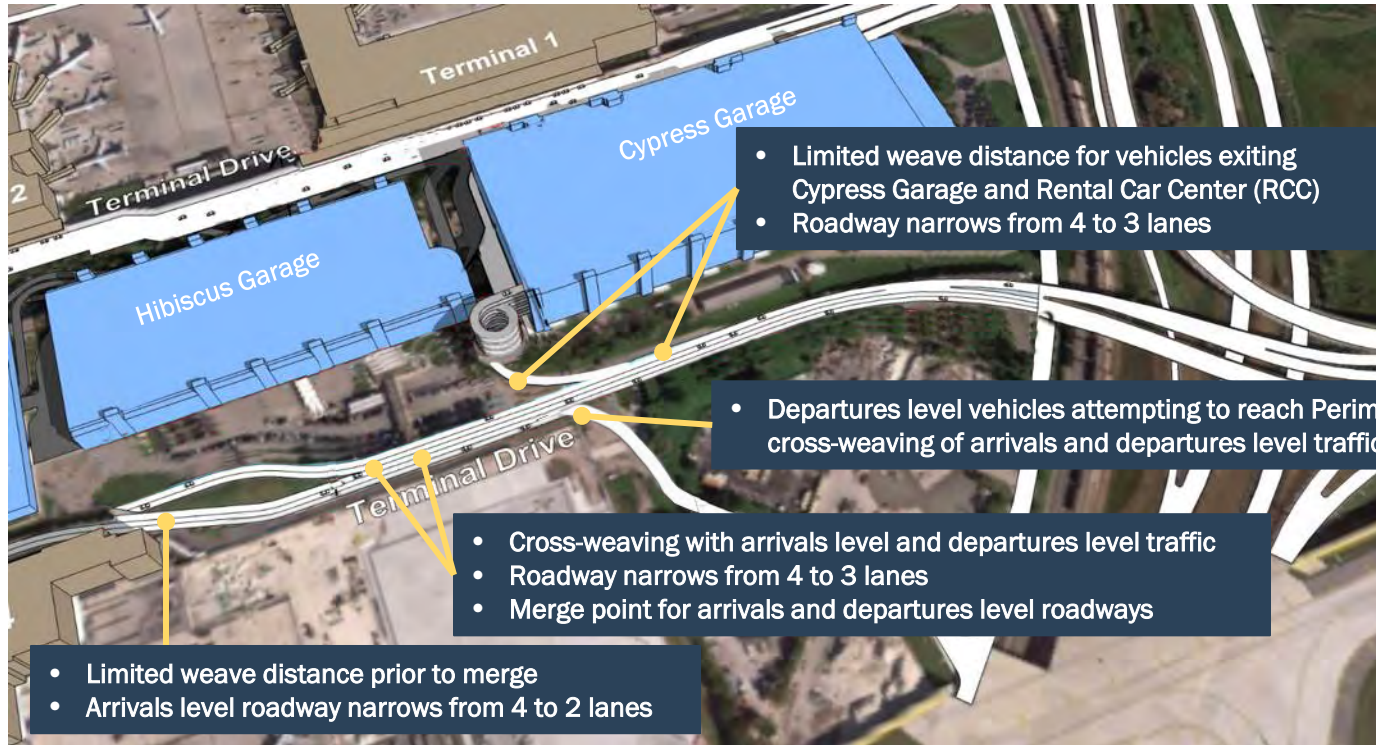
Notes: MAP: Million Annual Passengers and Parking requirements include spaces for long-term parking, historically served through the economy parking product. Assumes accelerated forecast

Short-Term Improvements

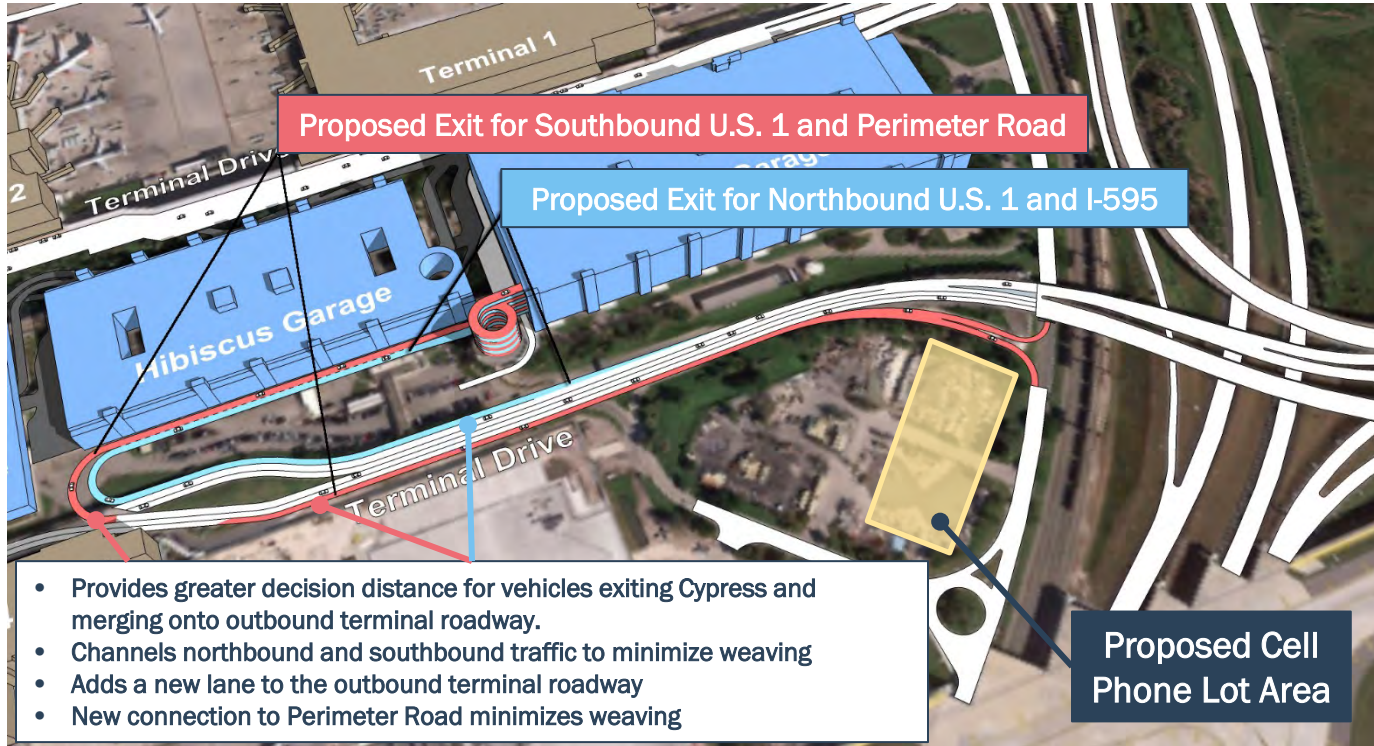
Landside & Terminal

Landside

Existing Roadway Congestion



Merging/Weaving & Exit Roadway Improvements



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

Arrivals Level:
No Delays

- Continue with FDOT coordination to have DMS on US-1 and I-595 (If possible)

Pedestrian Signalized Crosswalks

Illustrative Example

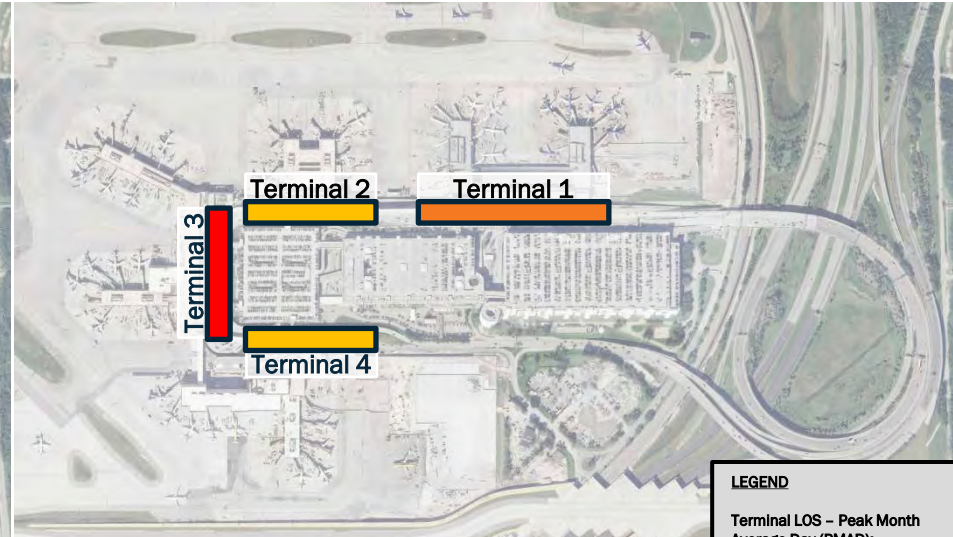
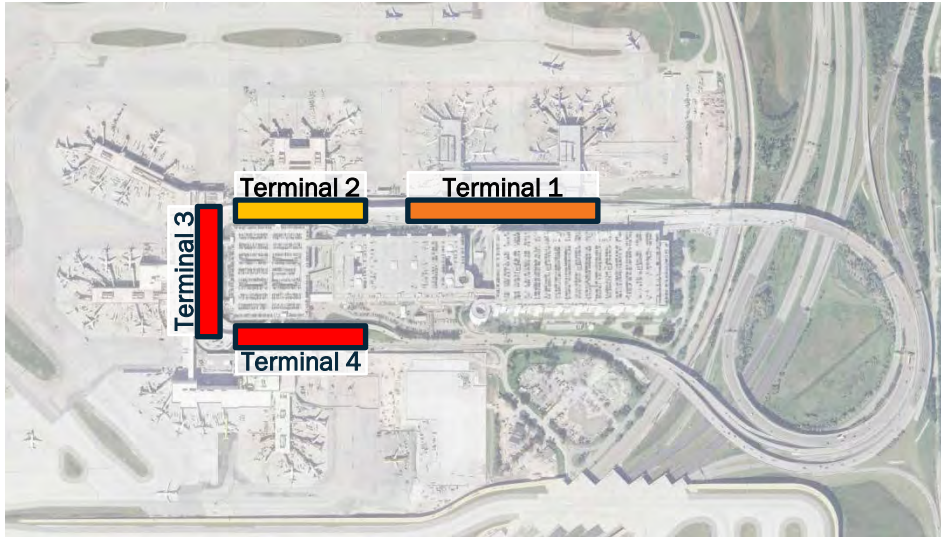


Photo Source: Google – John Wayne Airport

Arrivals Level Terminal Curbside LOS

Existing Conditions (2015)

2020 Conditions with Short-term Improvements



LEGEND

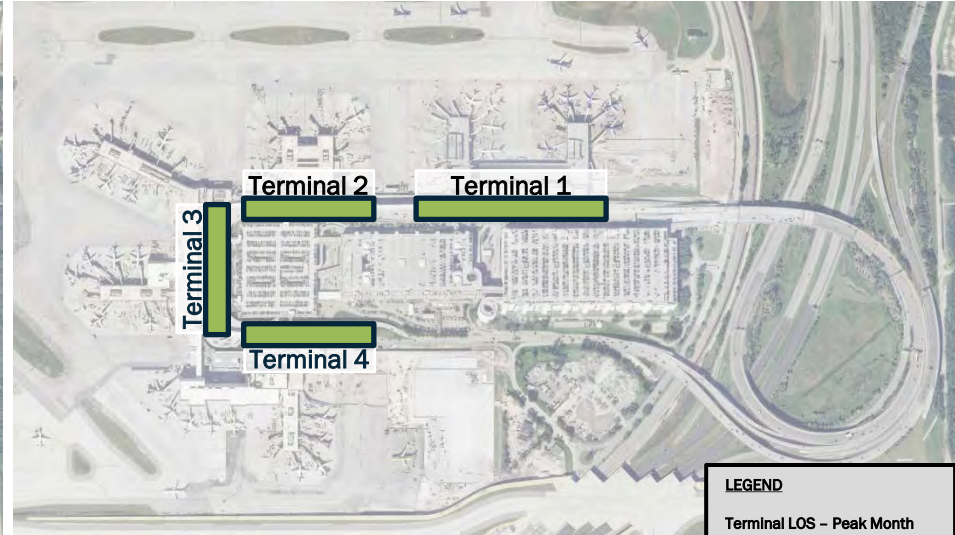
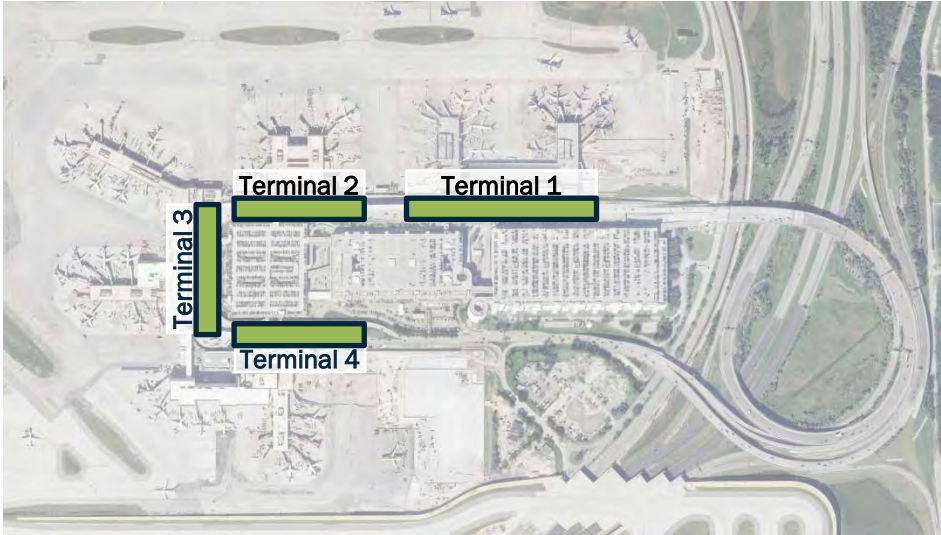
Terminal LOS - Peak Month Average Day (PMAD):

- C or better
- D
- E
- F

Departures Level Terminal Curbside LOS

Existing Conditions (2015)

2020 Conditions with Short-term Improvements



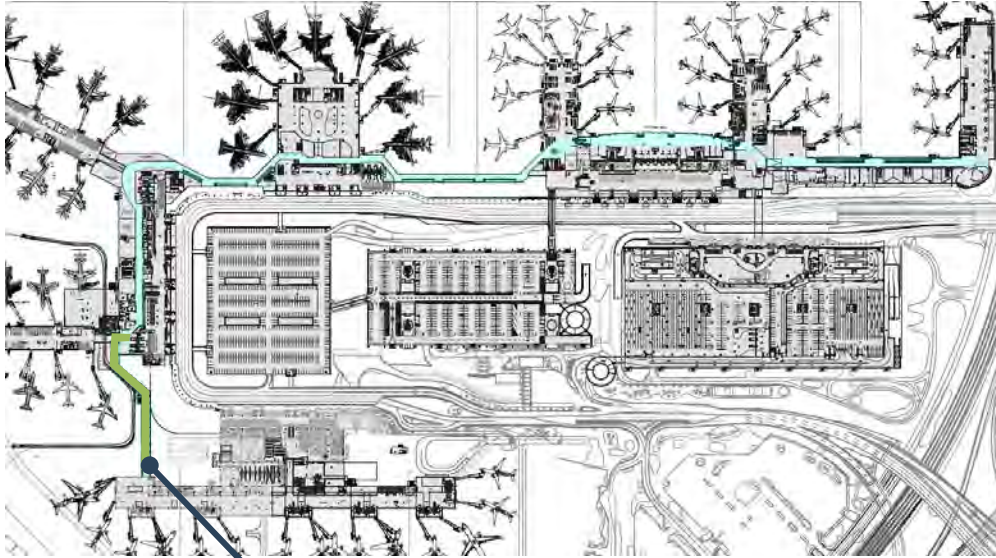
LEGEND

Terminal LOS - Peak Month Average Day (PMAD):

- C or better
- D
- E
- F

Terminal

Post-Security Checkpoint Terminal Connection Plan

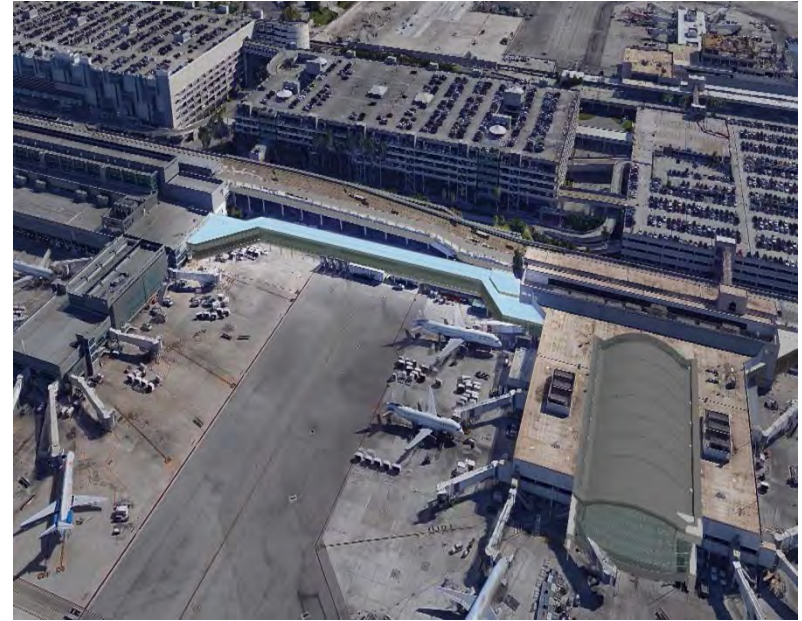
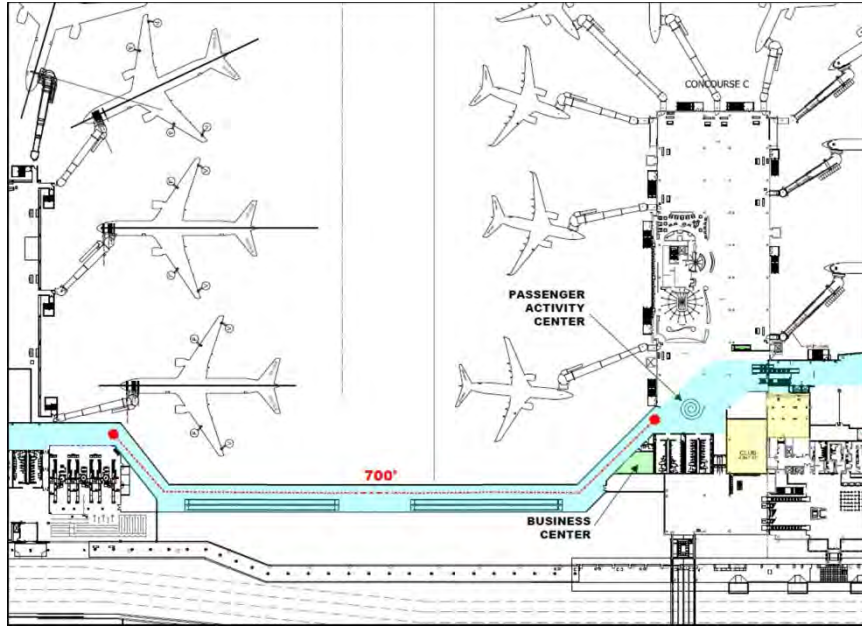


T3-T4 Connector completed
November 2016

Terminal Connection Plan

Proposed T1-T2 Connector Concept

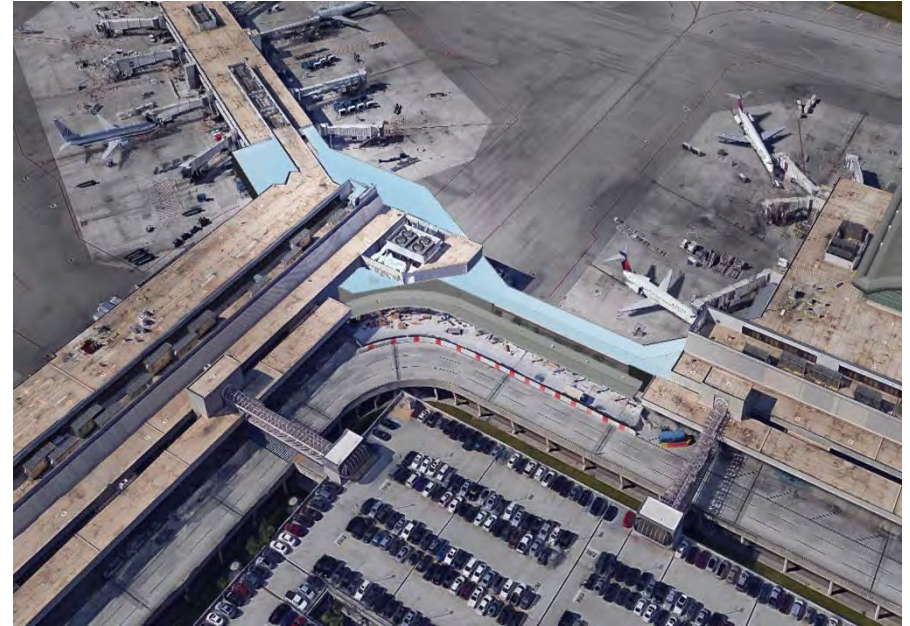
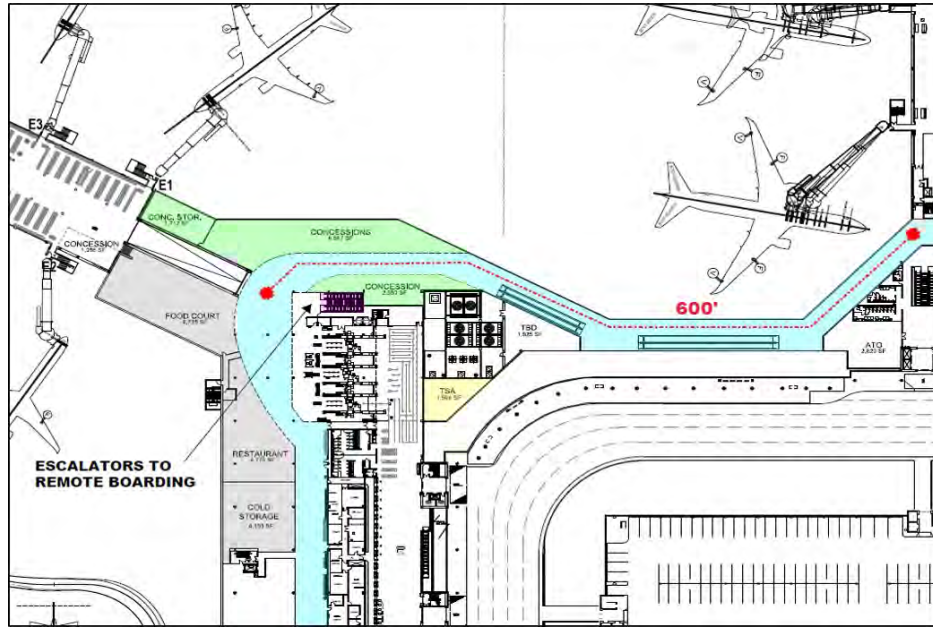
(PRELIMINARY DRAFT) WORK IN PROGRESS - FOR DISCUSSION PURPOSES ONLY



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



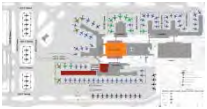
Satellite
Pier Opt 6



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

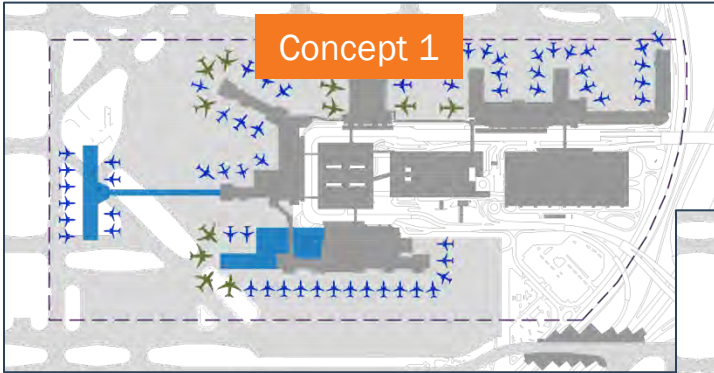
Does not Meet Criteria

Short-listed Concepts

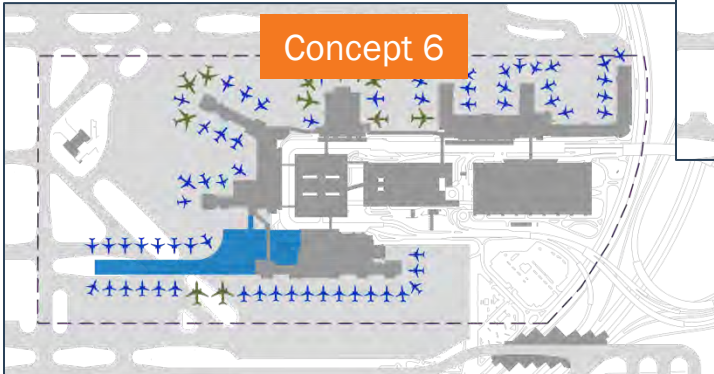
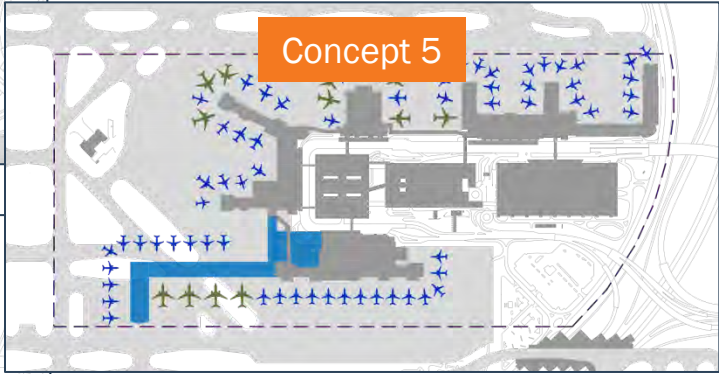
Short Listed Terminal Concepts

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

Phase 1 Development (77 Gate Complex)



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

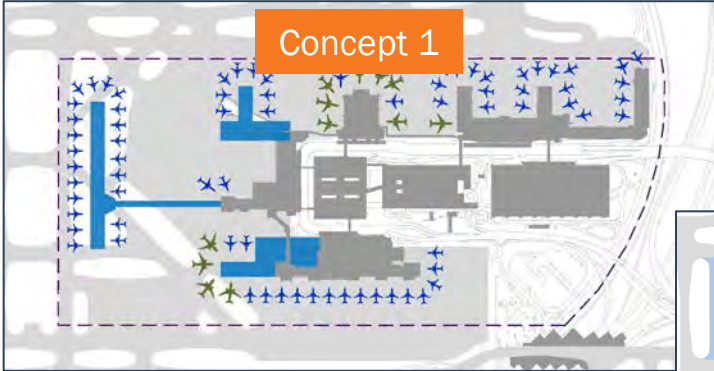
 Widebody Gate

Short Listed Terminal Concepts

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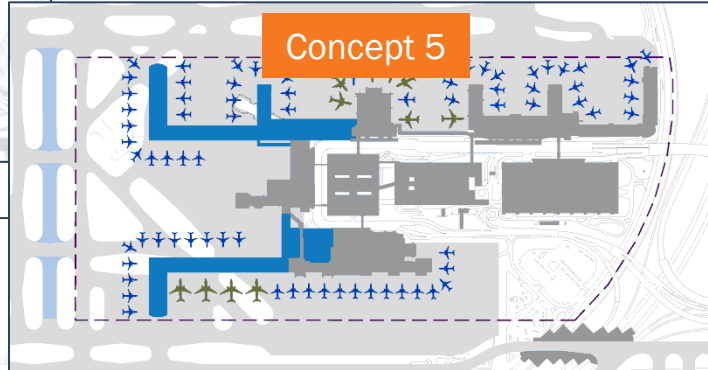
Phase 2/3 Development (83 - 85 Gate Complex)

Concept 1

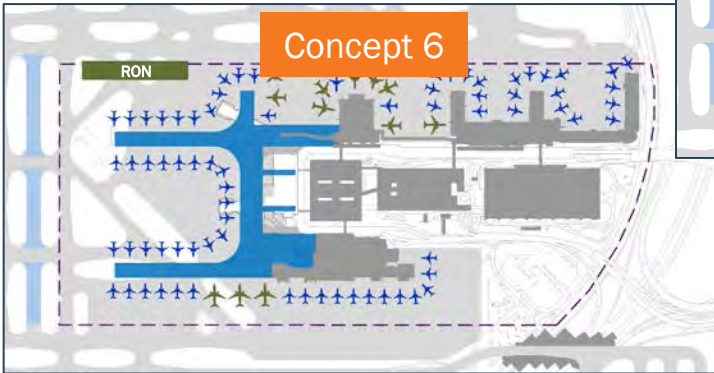


Short-listed (from those considered):
Develop mid-field Concourse and/or
Expand Concourse G to the west

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

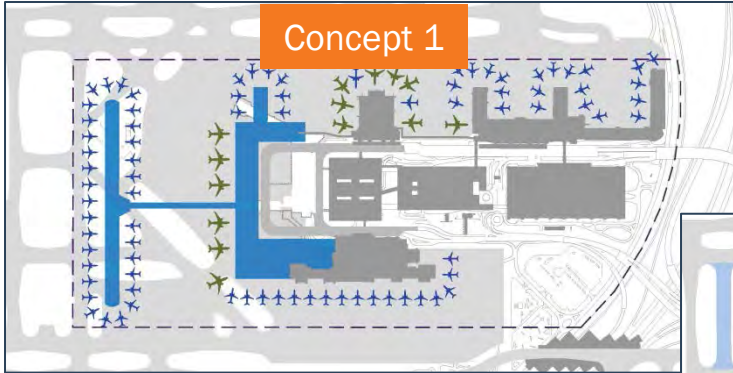
 Widebody Gate

Short Listed Terminal Concepts

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

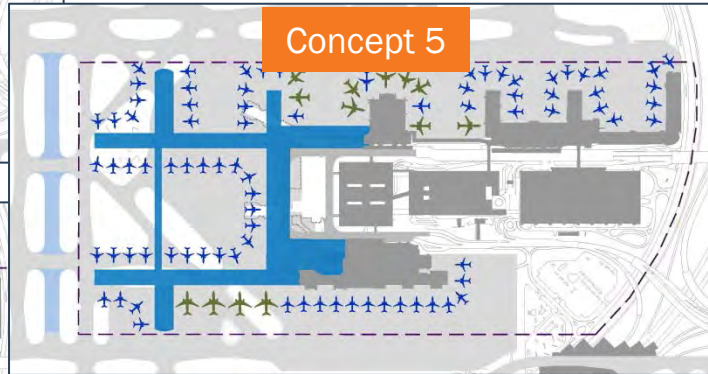
Ultimate Phase (Post 2035) Development (95 Gate Complex)

Concept 1

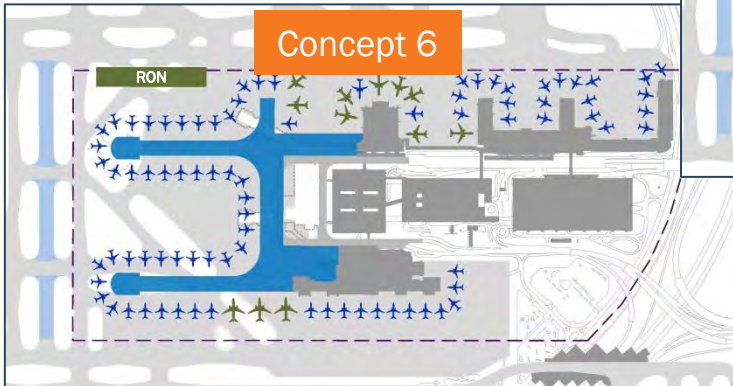


Short-listed (from those considered):
Develop mid-field Concourse and/or
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Concept 5



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

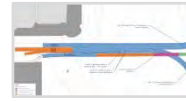
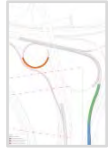
 Widebody Gate

Targets balance with practical
airfield capacity

Landside

Range of Landside Concepts Considered

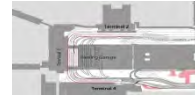
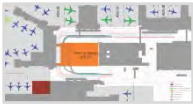
Ingress/
Egress



Terminal
Roadway



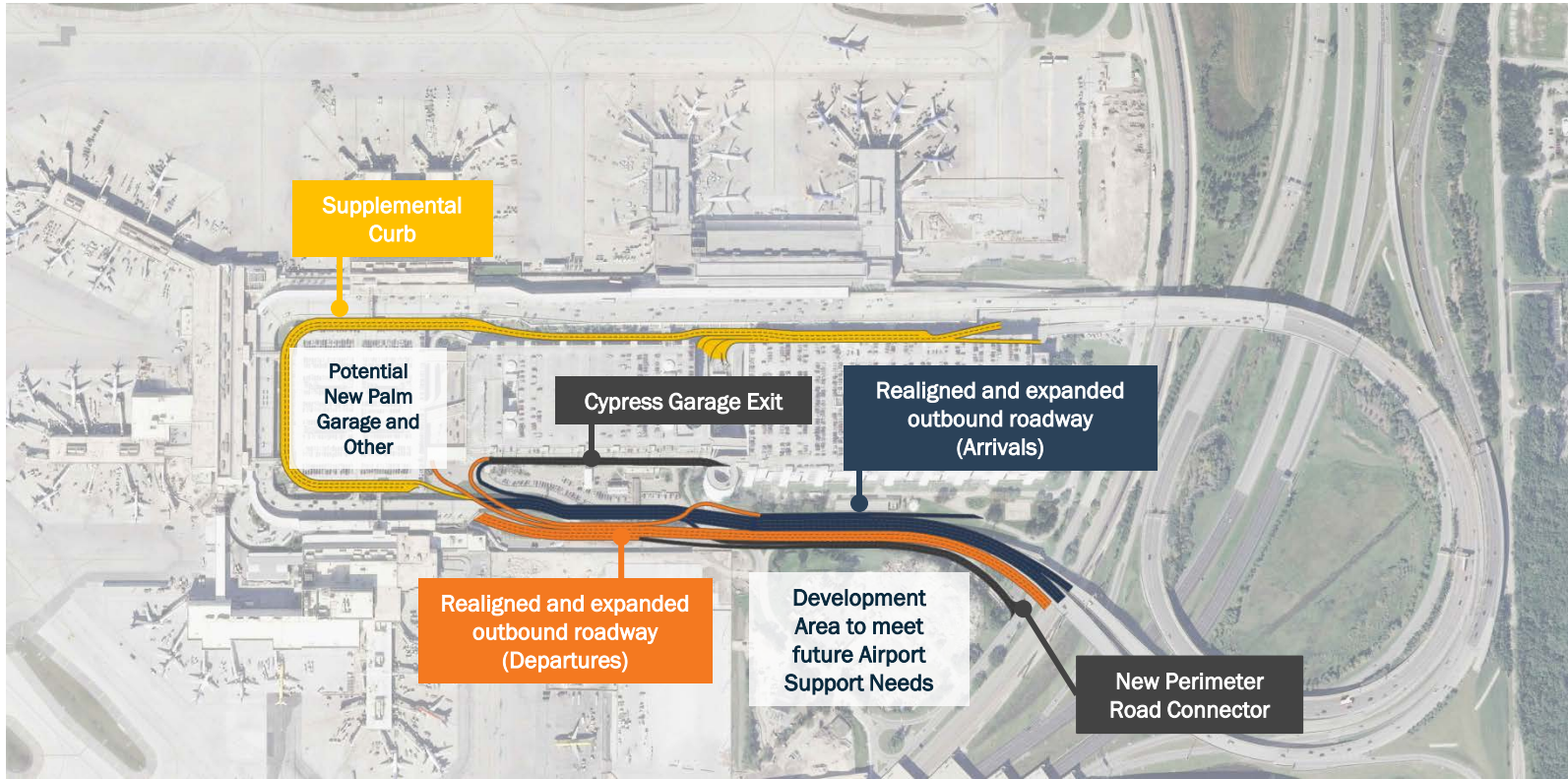
Terminal
Curb



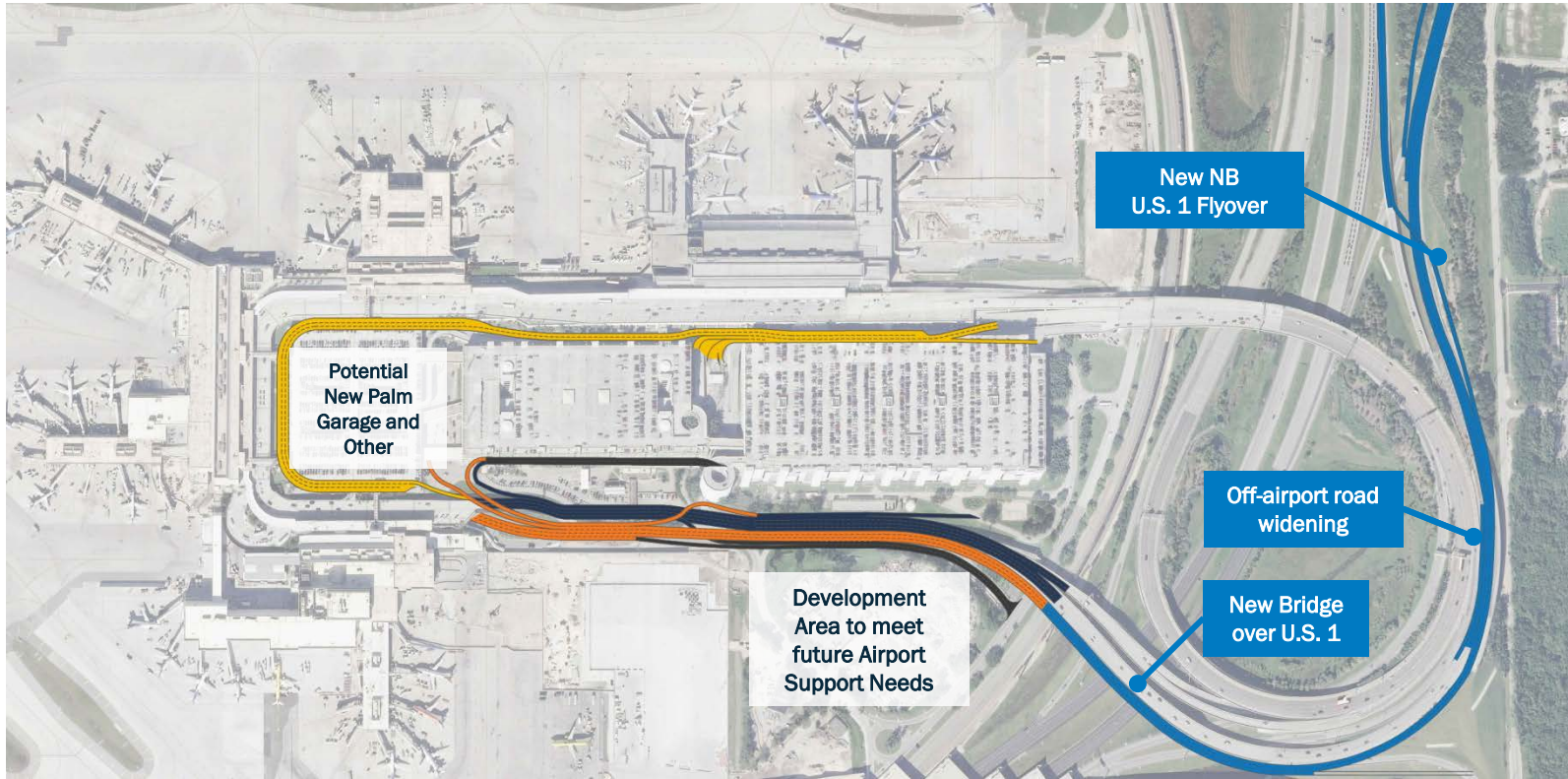
Parking
and Rental
Car
Facilities



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

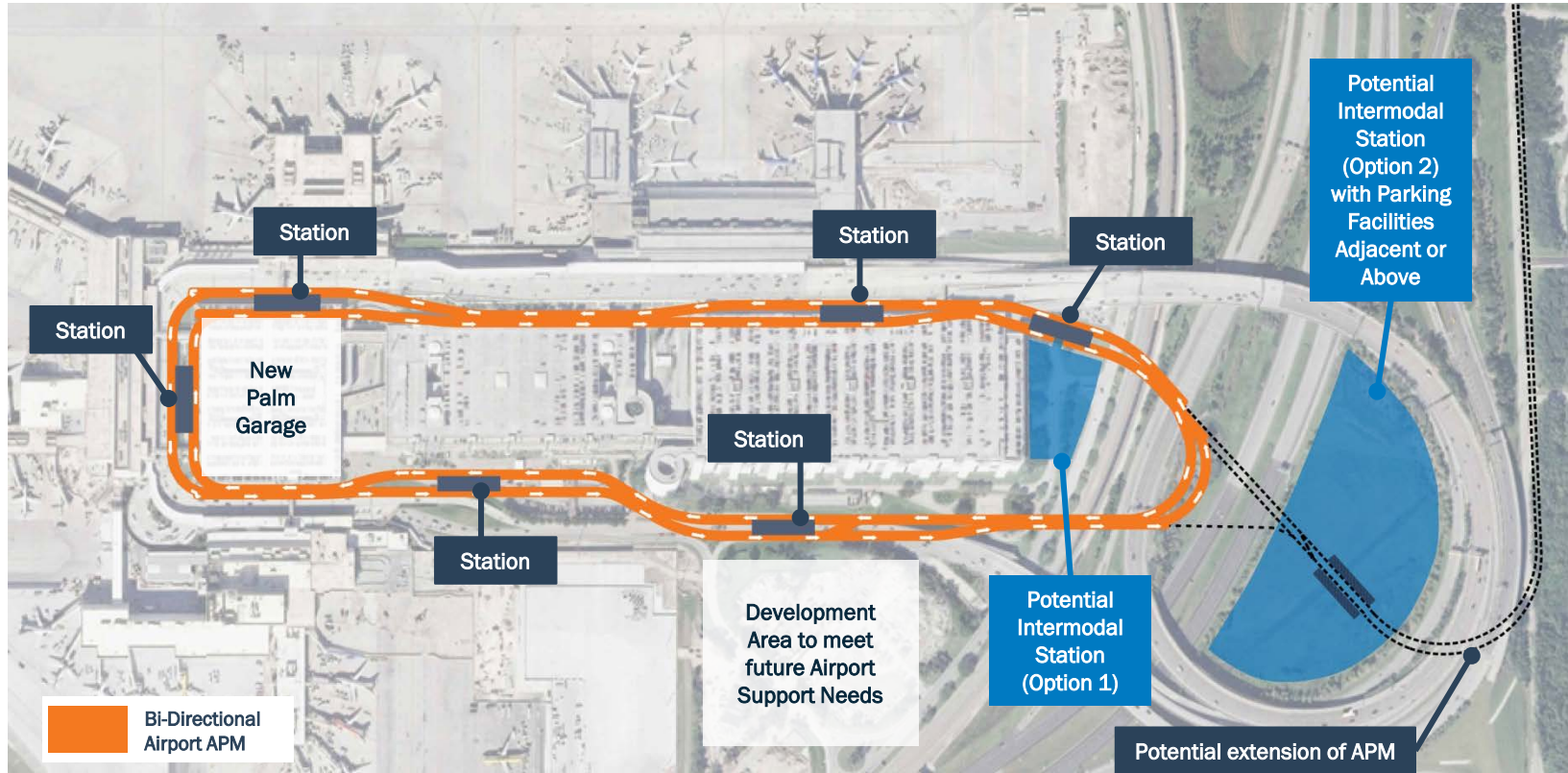
Existing



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

Stakeholder Engagement and Meetings Review



POLICY ADVISORY COMMITTEE

First Meeting: September 22nd 2016
 Next meeting: 2nd Quarter 2017
 Third Meeting: 3rd Quarter 2017

TECHNICAL ADVISORY COMMITTEE

First Meeting: September 28th 2016
 Next Meeting: 2nd Quarter 2017
 Third Meeting: 3rd Quarter 2017

PUBLIC MEETINGS - Up to 3 Meetings

Fall 2017
 Winter 2018
 Spring 2018



FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT

BROWARD COUNTY, FLORIDA

THANK YOU



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

