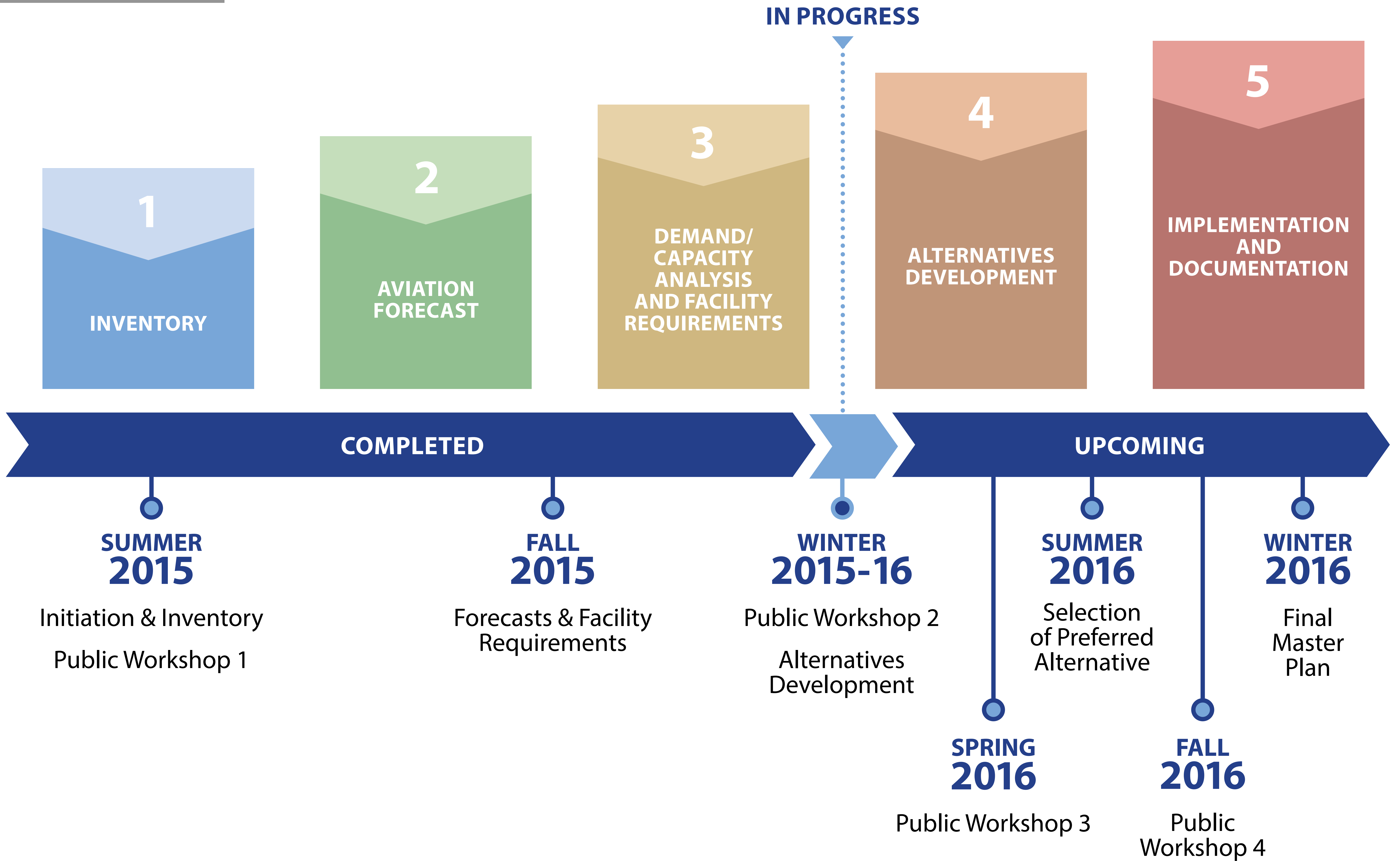# Goals

Encompass improvements that will ensure the airport's safety, efficiency, and capability to serve the community's aviation needs
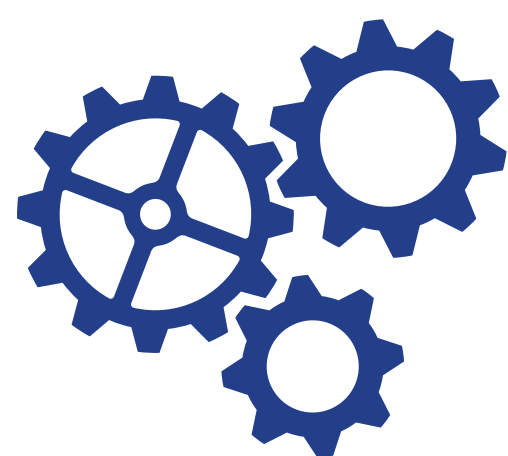
Optimize infrastructure and resources in an operationally, financially and environmentally sustainable manner
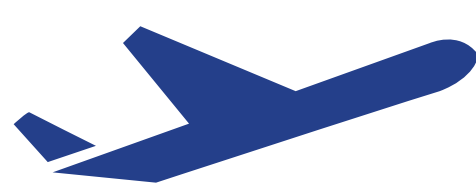
Enhance the passenger and customer experience through long range development actions

Define development plans that are scalable to respond to variations in demand over the planning horizon

Preserve flexibility to adapt to emerging and future technologies

Accommodate connectivity to various modes of transportation as components of airport development plans

Aviation Forecasts

Despite economic, industry and global events, the demand for air travel continues to trend upward. The Research Triangle region continues to sustain growth in air travel.
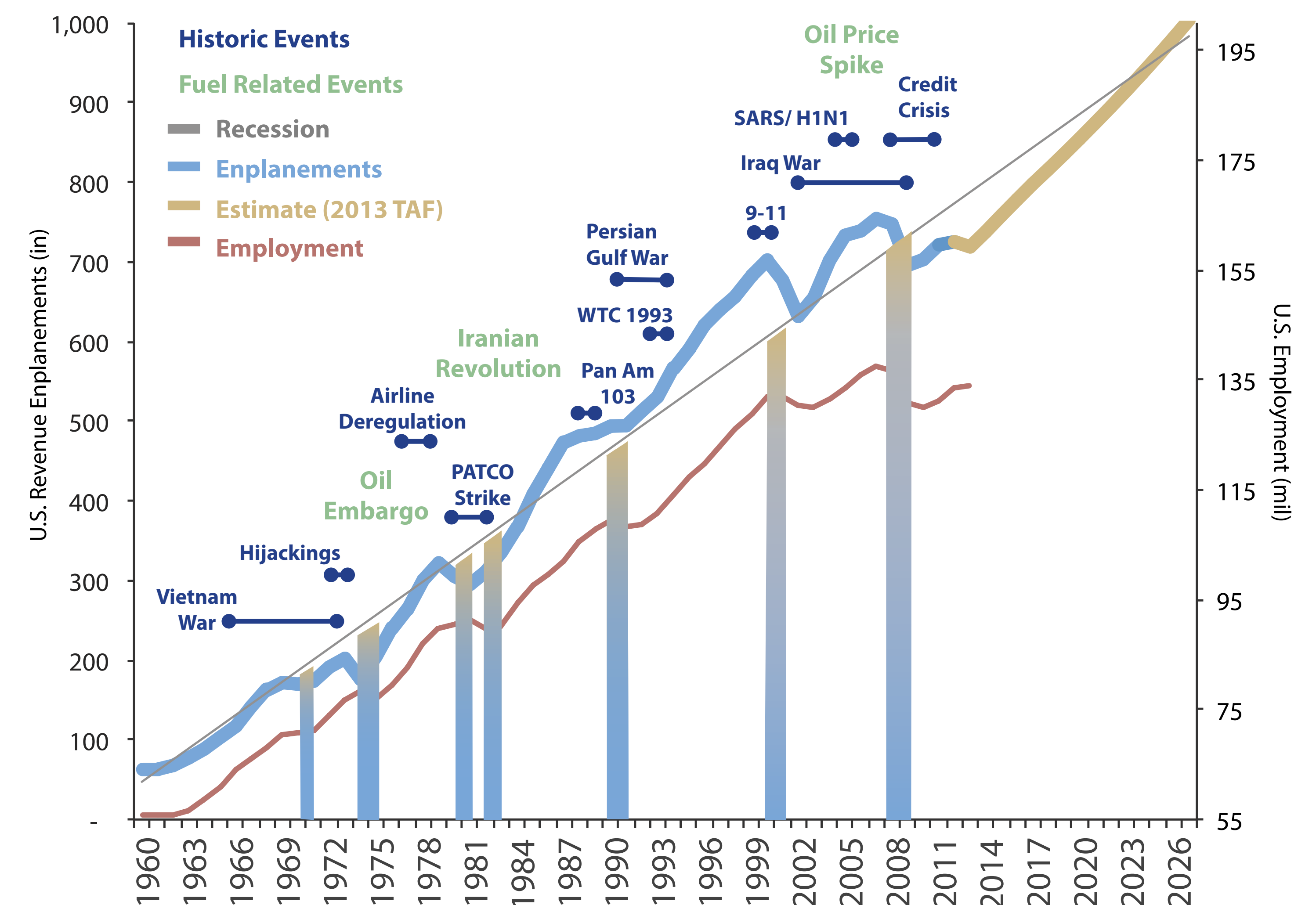
Baseline Forecast Scenario:
Most likely estimate of activity over the planning horizon, reviewed by the FAA as part of planning process

High Forecast Scenario: Economic growth greater than forecast

Low Forecast Scenario: Extended recession similar in scale to that experienced in 2007/2008

History of U.S. Domestic Passenger Growth

Historic Events
Fuel Related Events
— Recession
— Enplanements
— Estimate (2013 TAF)
— Employment

Historic Events labeled on chart:
Vietnam War, Hijackings, Oil Embargo, Airline Deregulation, PATCO Strike, Iranian Revolution, Pan Am 103, WTC 1993, Persian Gulf War, 9-11, Iraq War, SARS/ H1N1, Oil Price Spike, Credit Crisis

Y-axis left: U.S. Revenue Enplanements (in) — 100 to 1,000
Y-axis right: U.S. Employment (mil) — 55 to 195
X-axis: 1960 to 2026

Sources: U.S. DOT T-100, August 2015; U.S. Bureau of Labor Statistics, August 2015.

RDU Historical Airport Activity

Labels on chart: American Airlines begins hub closure; 9/11 Attacks; Fuel Shock; American Airlines opens RDU hub; Midway Airlines begins service; Midway Airlines bankruptcy; Great Recession

Y-axis: Total Passengers (mil) — 0.0 to 12.0
X-axis: 1985 to 2013
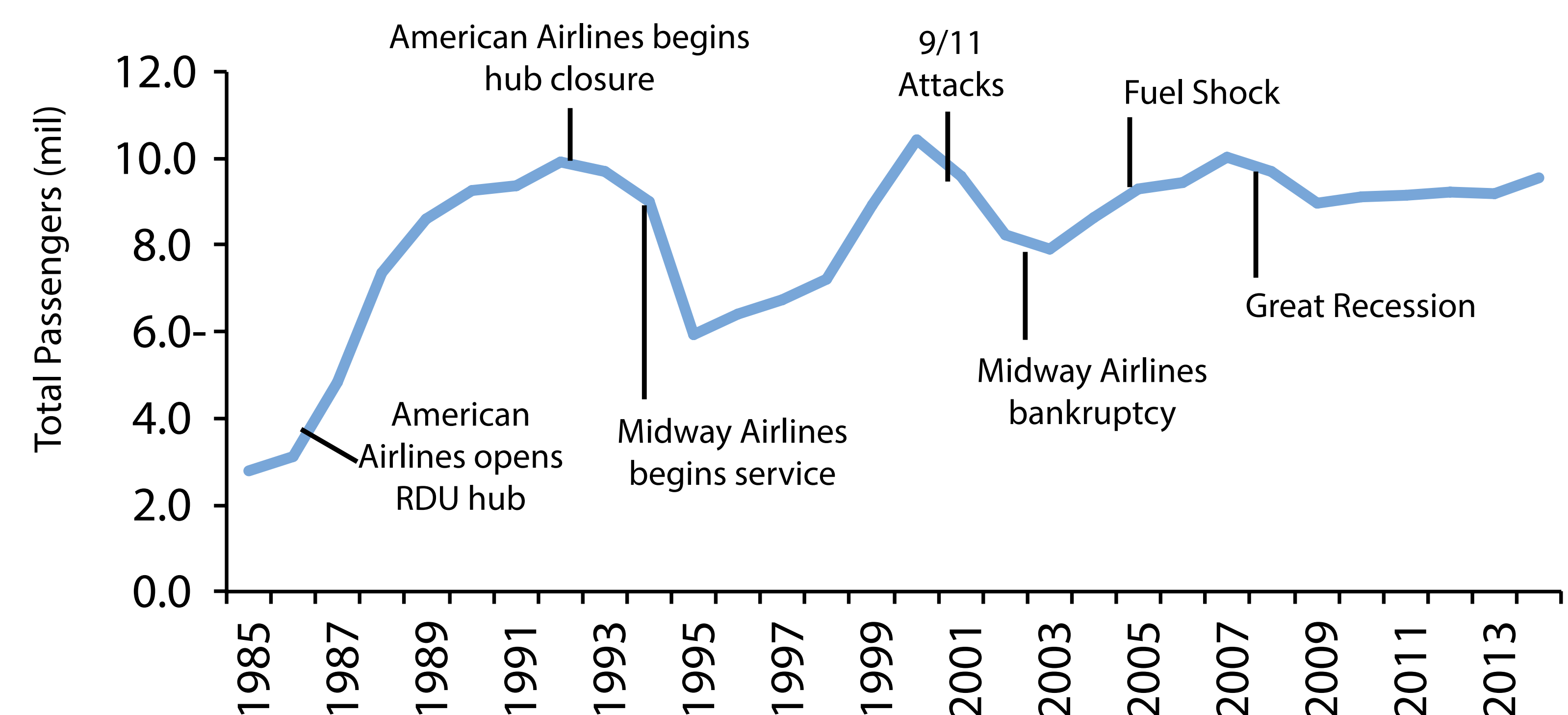
Source: Raleigh Durham Airport Authority Activity Statistics, July 2015

Aviation Forecasts

Total Operations

Aircraft Operations

400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

2.3% CAGR
1.5% CAGR
0.4% CAGR

Historical   Baseline   Low   High
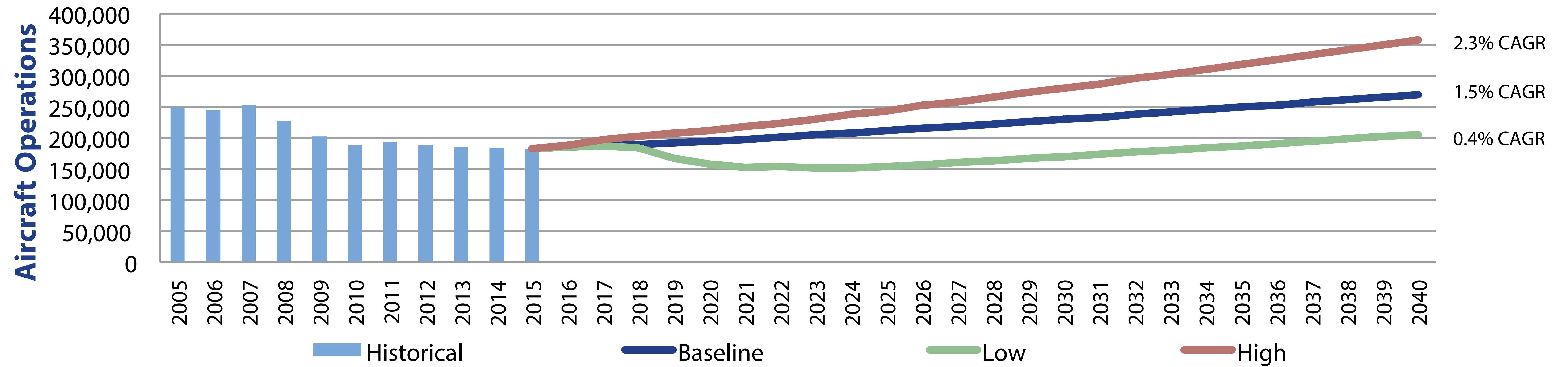
Passenger Airline Enplanements

Enplaned Passengers

14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

3.6% CAGR
2.3% CAGR
1.4% CAGR

Historical   Baseline   Low   High
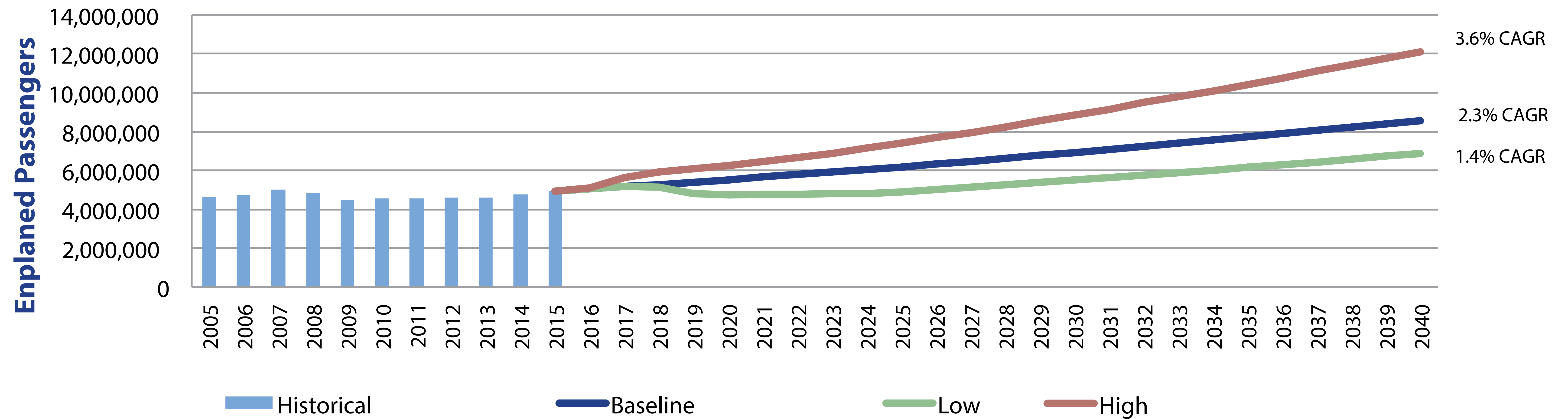
CAGR: Compound Annual Growth Rate | FAA Approval of Baseline Forecasts Received November 2015

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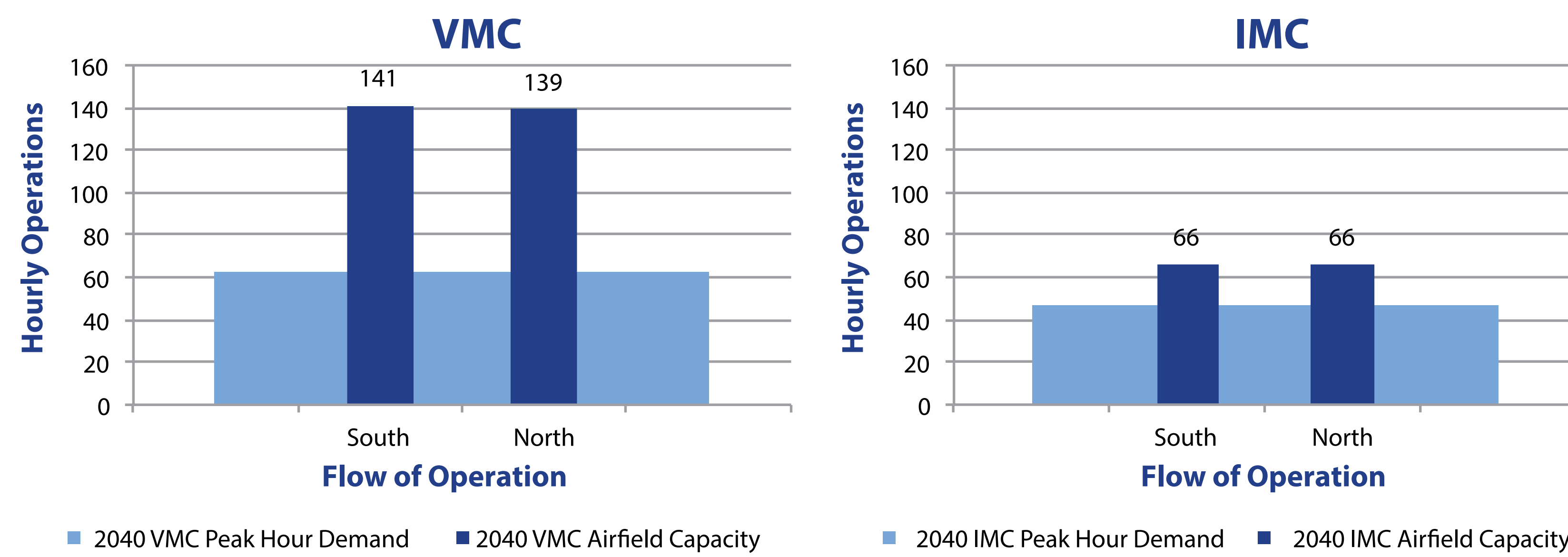RDU   **Raleigh-Durham Airport Authority**   **#rdu2040**

Airfield Capacity and Configuration

Incremental capacity gains required during planning horizon; preserve the ability to increase airfield capacity beyond 2040 to meet demand growth
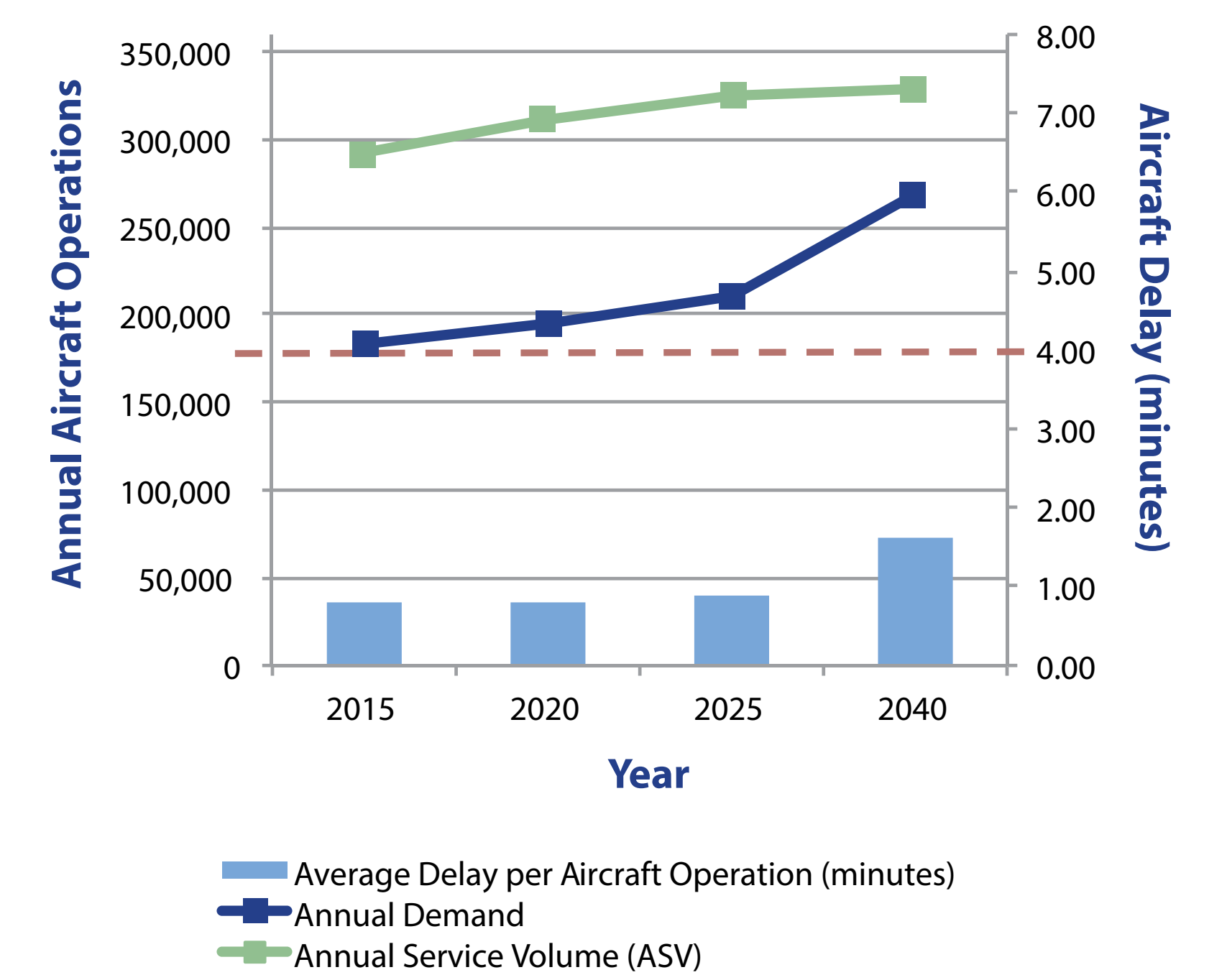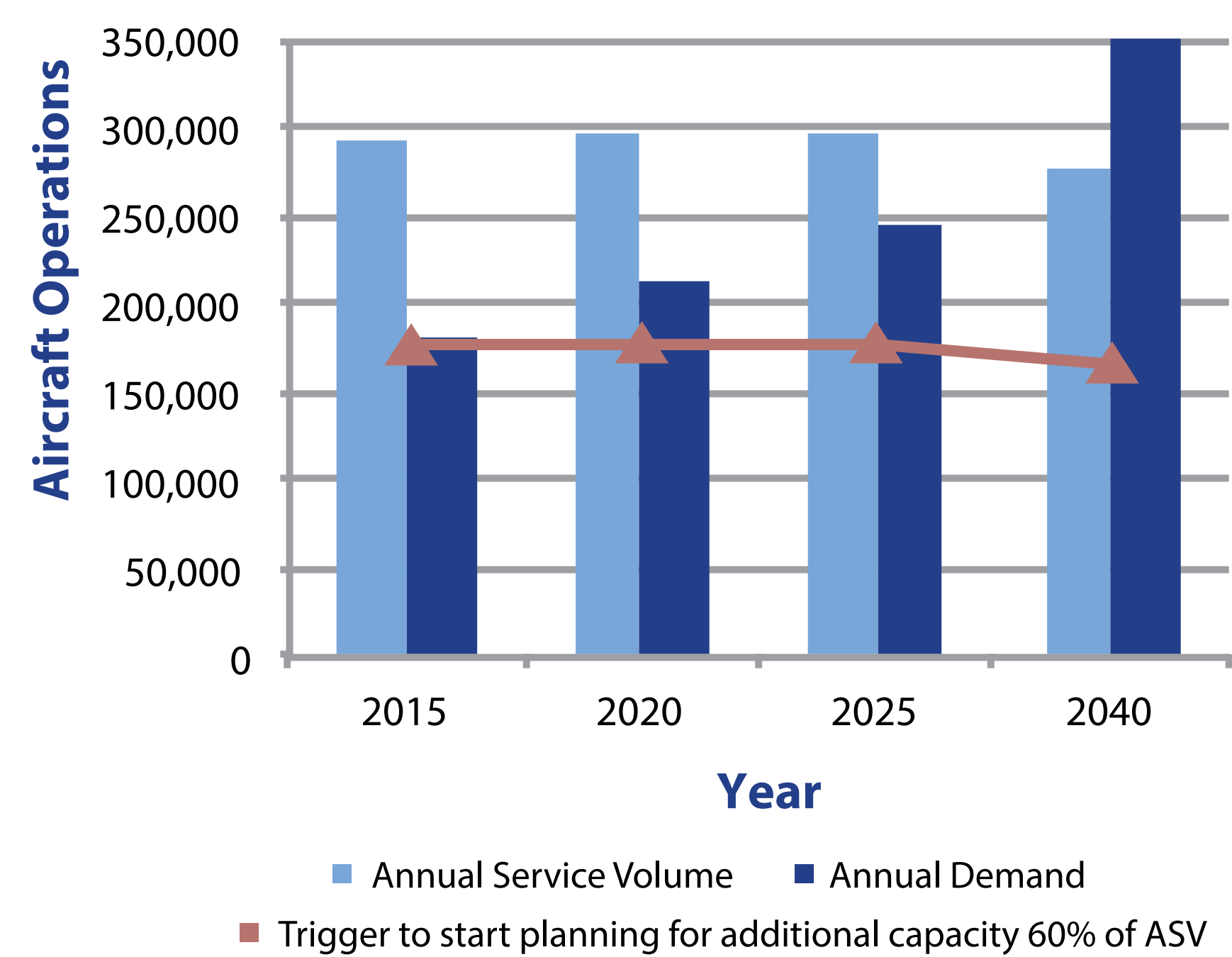
ASV/Demand Relationship Baseline Forecast

Legend:
- Annual Service Volume
- Annual Demand
- Trigger to start planning for additional capacity 60% of ASV
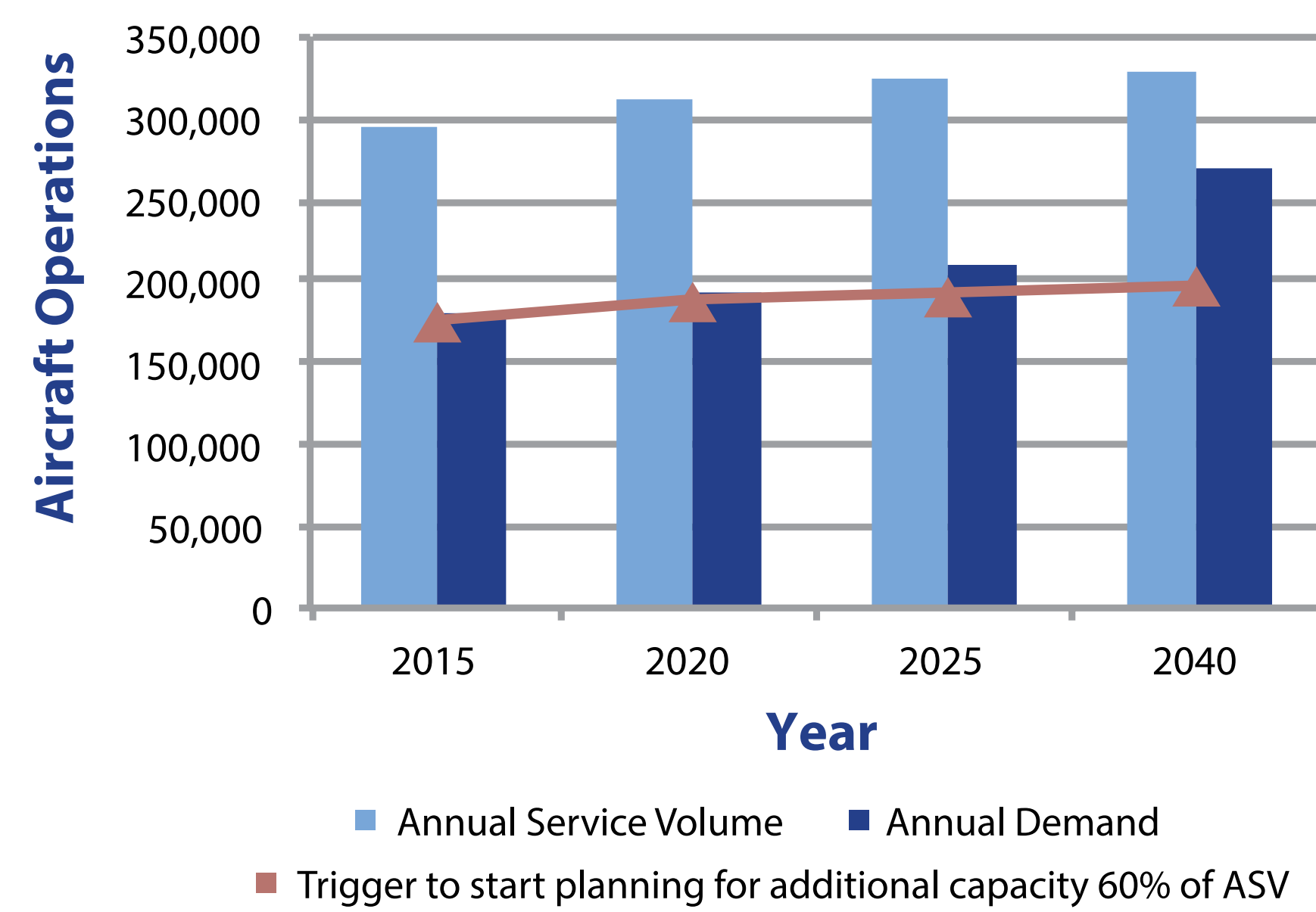
Hourly 2040 Demand/Capacity - Baseline Forecast

VMC

Values: South 141, North 139

Legend:
- 2040 VMC Peak Hour Demand
- 2040 VMC Airfield Capacity

IMC

Values: South 66, North 66

Legend:
- 2040 IMC Peak Hour Demand
- 2040 IMC Airfield Capacity

Demand/Capacity/Delay Relationship Baseline

Legend:
- Average Delay per Aircraft Operation (minutes)
- Annual Demand
- Annual Service Volume (ASV)

ASV/Demand Relationship High Forecast

Legend:
- Annual Service Volume
- Annual Demand
- Trigger to start planning for additional capacity 60% of ASV

Hourly 2040 Demand/Capacity - High Forecast

VMC Values: South 139, North 141

Legend:
- 2040 VMC Peak Hour Demand
- 2040 VMC Airfield Capacity

IMC Values: South 66, North 64

Legend:
- 2040 IMC Peak Hour Demand
- 2040 IMC Airfield Capacity

Demand/Capacity/Delay Relationship High Forecast

Legend:
- Average Delay per Aircraft Operation (minutes)
- Annual Demand
- Annual Service Volume (ASV)
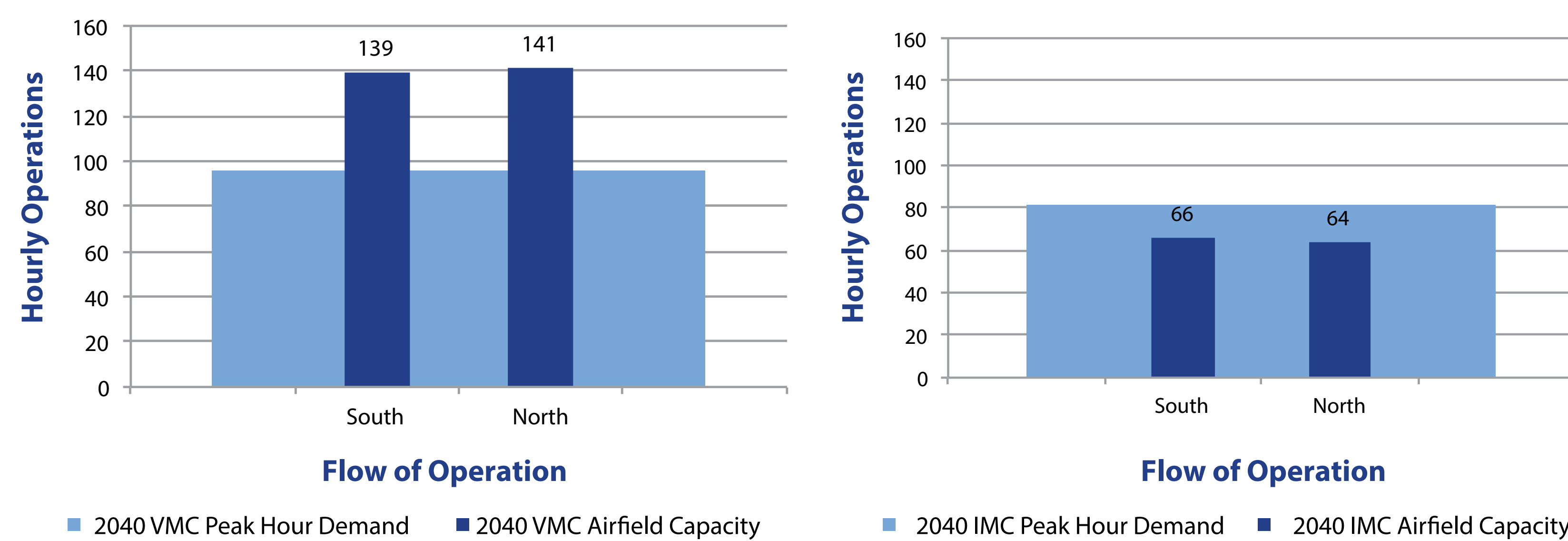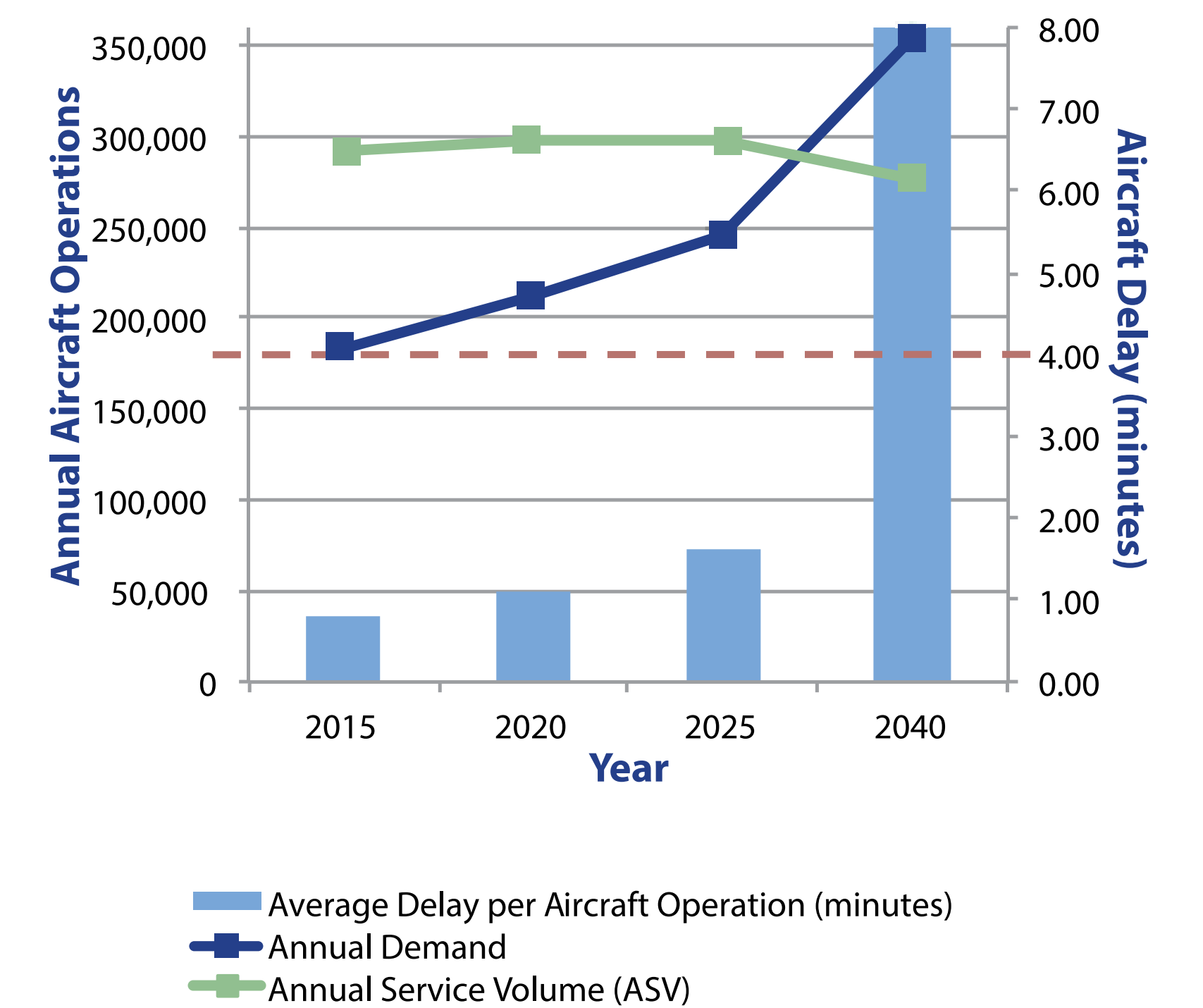
ASV: Annual Service Volume   VMC: Visual Meteorological Conditions   IMC: Instrument Meteorological Conditions

Runway Length vs. Aircraft Needs

Runway length requirements are a function of the markets served (stage length/range), the number of passengers and amount of cargo (payload), and ambient temperatures

3,750 NM Stage length (Transatlantic); maximum takeoff weight + hot day

Flights to Transatlantic Markets

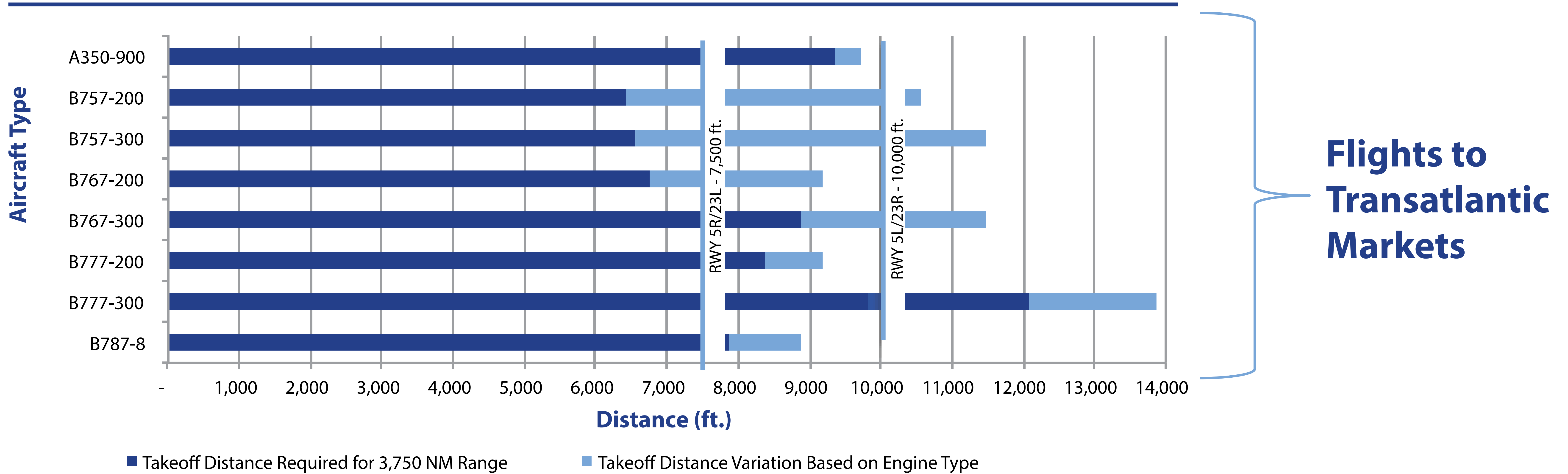Aircraft Type: A350-900, B757-200, B757-300, B767-200, B767-300, B777-200, B777-300, B787-8

RWY 5R/23L – 7,500 ft.
RWY 5L/23R – 10,000 ft.

Distance (ft.): -, 1,000, 2,000, 3,000, 4,000, 5,000, 6,000, 7,000, 8,000, 9,000, 10,000, 11,000, 12,000, 13,000, 14,000

■ Takeoff Distance Required for 3,750 NM Range ■ Takeoff Distance Variation Based on Engine Type

6,200 NM Stage length (Transpacific); maximum takeoff weight + hot day

Flights to Transpacific Markets

Aircraft Type: B777-20, B787-9

RW 5R/23L
RW 5L/23R

Distance (ft.): -, 1,000, 2,000, 3,000, 4,000, 5,000, 6,000, 7,000, 8,000, 9,000, 10,000, 11,000, 12,000, 13,000, 14,000

■ Takeoff Distance Required for 6,200 NM Range
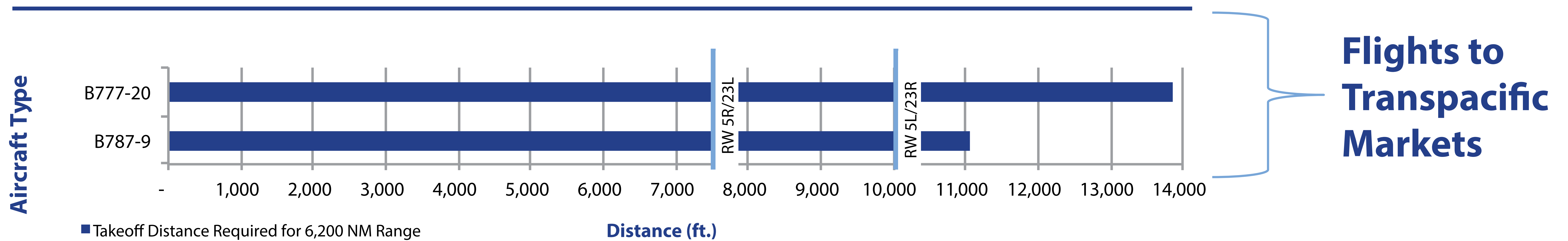
Terminal Facilities

Level of Service

Free flows
No Delays
Overdesign

Target Level of Service

Unstable flows
Unacceptable delays
Suboptimum

Terminal 1

Facility		2015	2020	2025	2040
Airline Office and Support	BASELINE				
	HIGH SCENARIO				
Airline Operations	BASELINE				
	HIGH SCENARIO				
Baggage Claim	BASELINE				
	HIGH SCENARIO				
Inbound Baggage Handling	BASELINE				
	HIGH SCENARIO				
Baggage Service Office	BASELINE				
	HIGH SCENARIO				
Baggage Handling Support and Offices	BASELINE				
	HIGH SCENARIO				
Baggage Screening	BASELINE				
	HIGH SCENARIO				
Airport Support	BASELINE				
	HIGH SCENARIO				
Restrooms	BASELINE				
	HIGH SCENARIO				
MEP and IT	BASELINE				
	HIGH SCENARIO				
Check-in Hall	BASELINE				
	HIGH SCENARIO				
Passenger Security Screening Checkpoint	BASELINE				
	HIGH SCENARIO				
Holdrooms	BASELINE				
	HIGH SCENARIO				
Concessions	BASELINE				
	HIGH SCENARIO				
Baggage Makeup	BASELINE				
	HIGH SCENARIO				

Terminal 2

Facility		2015	2020	2025	2040
Airline Operations	BASELINE				
	HIGH SCENARIO				
Baggage Service Office	BASELINE				
	HIGH SCENARIO				
Baggage Make-up	BASELINE				
	HIGH SCENARIO				
Passenger Security Screening Checkpoint	BASELINE				
	HIGH SCENARIO				
Baggage Handling Support and Offices	BASELINE				
	HIGH SCENARIO				
Baggage Screening	BASELINE				
	HIGH SCENARIO				
FIS Secondary	BASELINE				
	HIGH SCENARIO				
Check-in Hall	BASELINE				
	HIGH SCENARIO				
Airline Office and Support	BASELINE				
	HIGH SCENARIO				
Airline Club	BASELINE				
	HIGH SCENARIO				
USO	BASELINE				
	HIGH SCENARIO				
Restrooms	BASELINE				
	HIGH SCENARIO				
Domestic Baggage Claim	BASELINE				
	HIGH SCENARIO				
Inbound Baggage Handling	BASELINE				
	HIGH SCENARIO				
Recheck Lobby	BASELINE				
	HIGH SCENARIO				
MEP and IT	BASELINE				
	HIGH SCENARIO				
Airport Support	BASELINE				
	HIGH SCENARIO				
FIS Primary	BASELINE				
	HIGH SCENARIO				
Concessions	BASELINE				
	HIGH SCENARIO				
Holdrooms	BASELINE				
	HIGH SCENARIO				
International Baggage Claim	BASELINE				
	HIGH SCENARIO				

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Terminal Gates

Terminal 1

Existing Terminal Complex:

- 9 Narrow Body (ADG-III) Gates

Future Gate Requirements:

- 2040: Up to 4 additional gates

Terminal 2

Existing Terminal Complex:

- Up to 36 gates
  (depending on aircraft fleet mix)
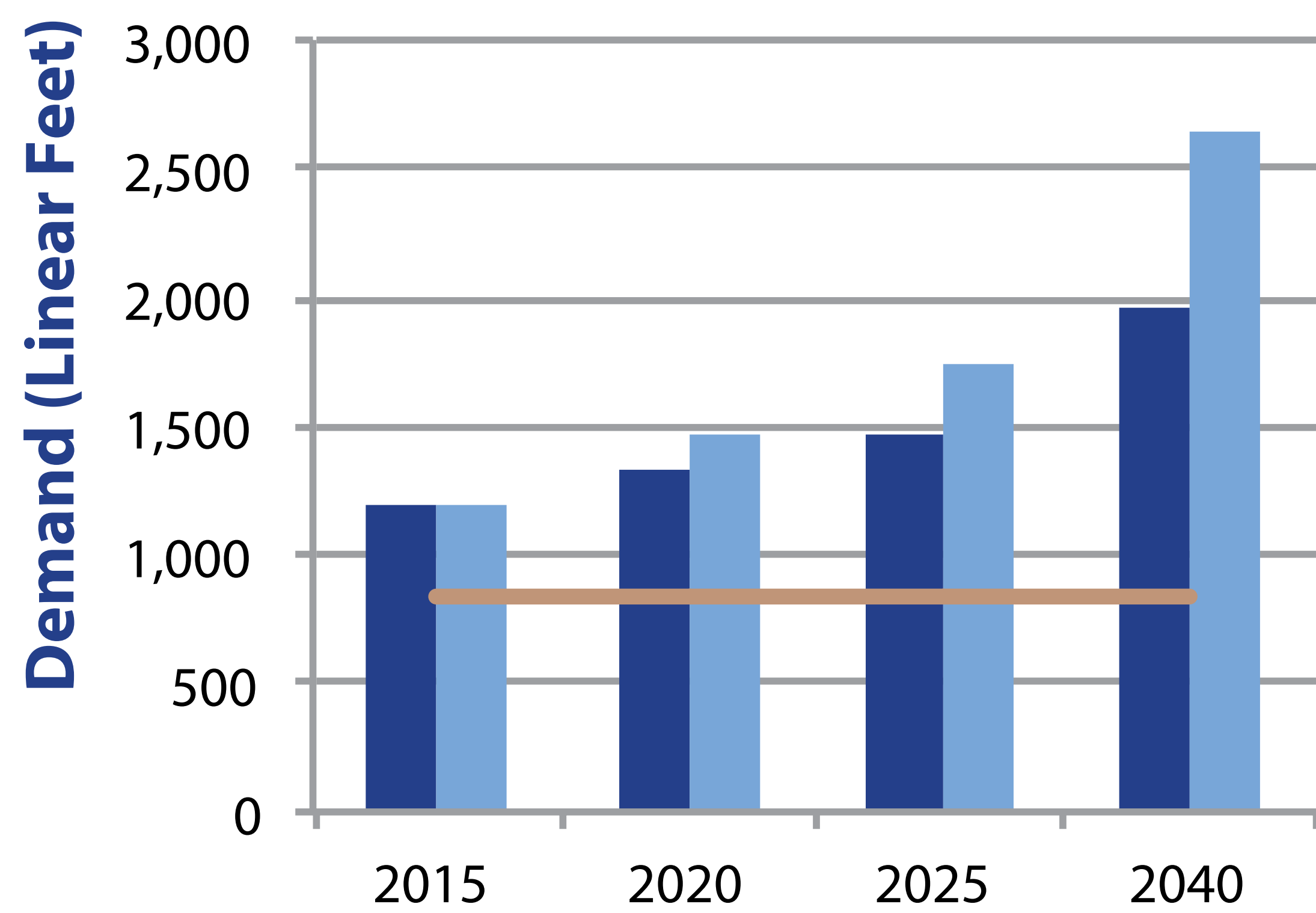
- 3 gates can accommodate
  international flights

Future Gate Requirements:

- 2020: Up to 5 additional gates

- 2025: Up to 11 additional gates

- 2040: Up to 19 additional gates

LEGEND

Regional Jet Aircraft   Narrowbody Aircraft   Widebody Aircraft

NOTES

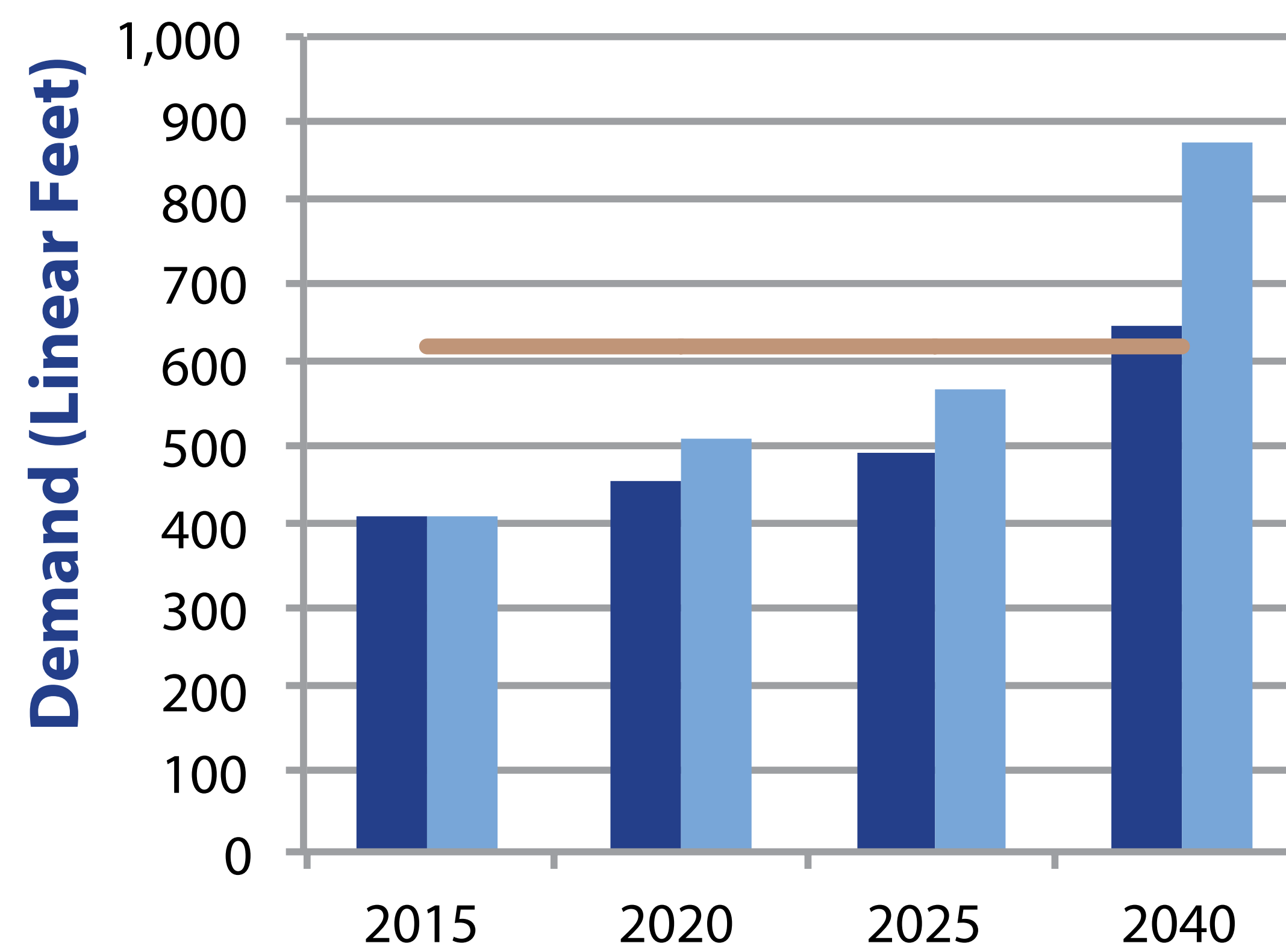Maximum aircraft by wingspan shown for each gate (October 2015).

SOURCE: Raleigh-Durham Airport Authority, Airport Layout Drawing, April 2015, Ricondo & Associates, Inc., October 2015
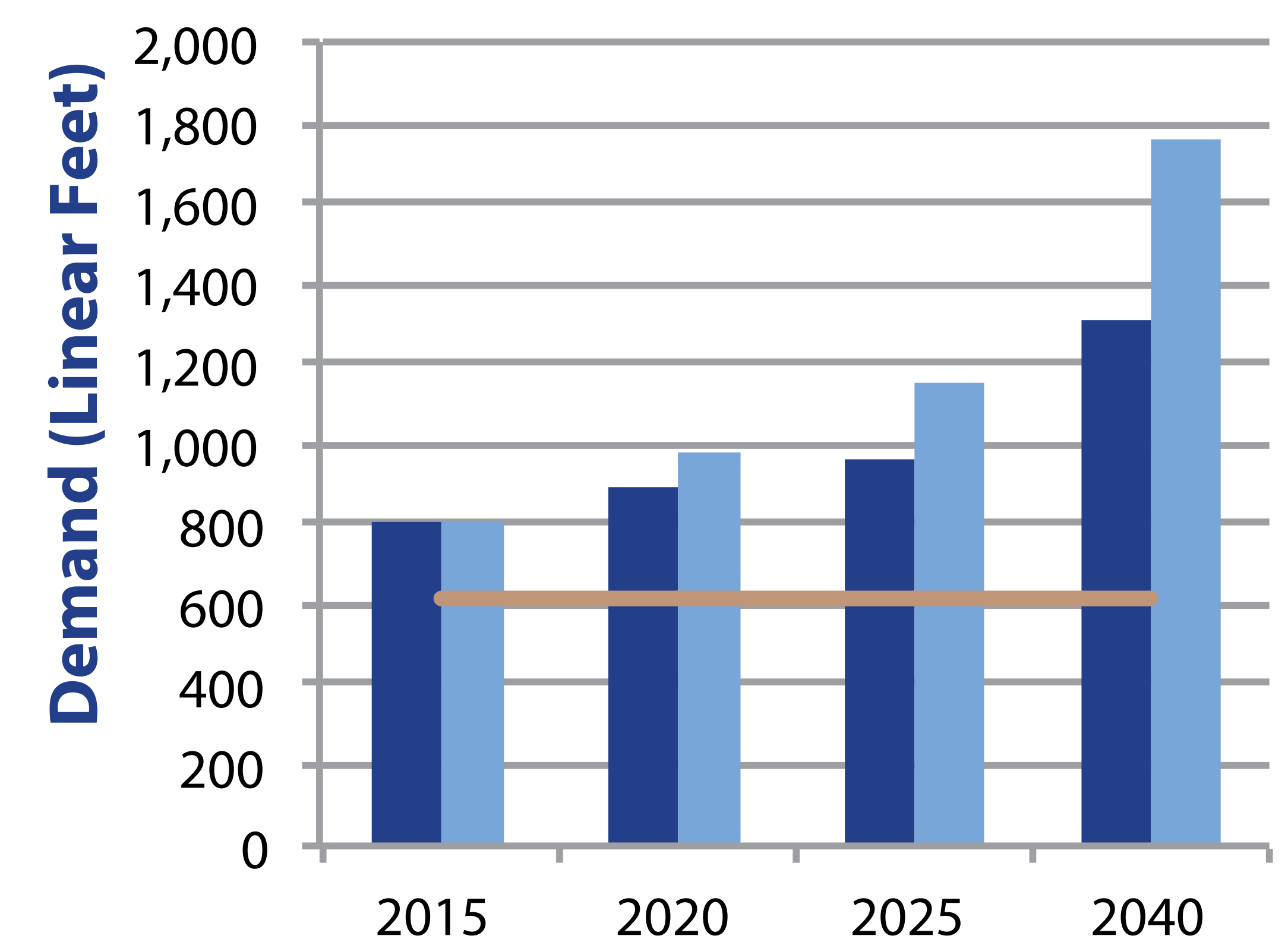PREPARED BY: Ricondo & Associates, Inc., October 2015

Terminal Curbsides

Terminal 1
Inner Roadway Curbside

Demand (Linear Feet)

3,000 — 2,500 — 2,000 — 1,500 — 1,000 — 500 — 0

2015 2020 2025 2040

Terminal 2
Upper Level Curbside

Demand (Linear Feet)

1,000 — 900 — 800 — 700 — 600 — 500 — 400 — 300 — 200 — 100 — 0

2015 2020 2025 2040

Terminal 2
Lower Level Inner Roadway Curbside

Demand (Linear Feet)

2,000 — 1,800 — 1,600 — 1,400 — 1,200 — 1,000 — 800 — 600 — 400 — 200 — 0

2015 2020 2025 2040

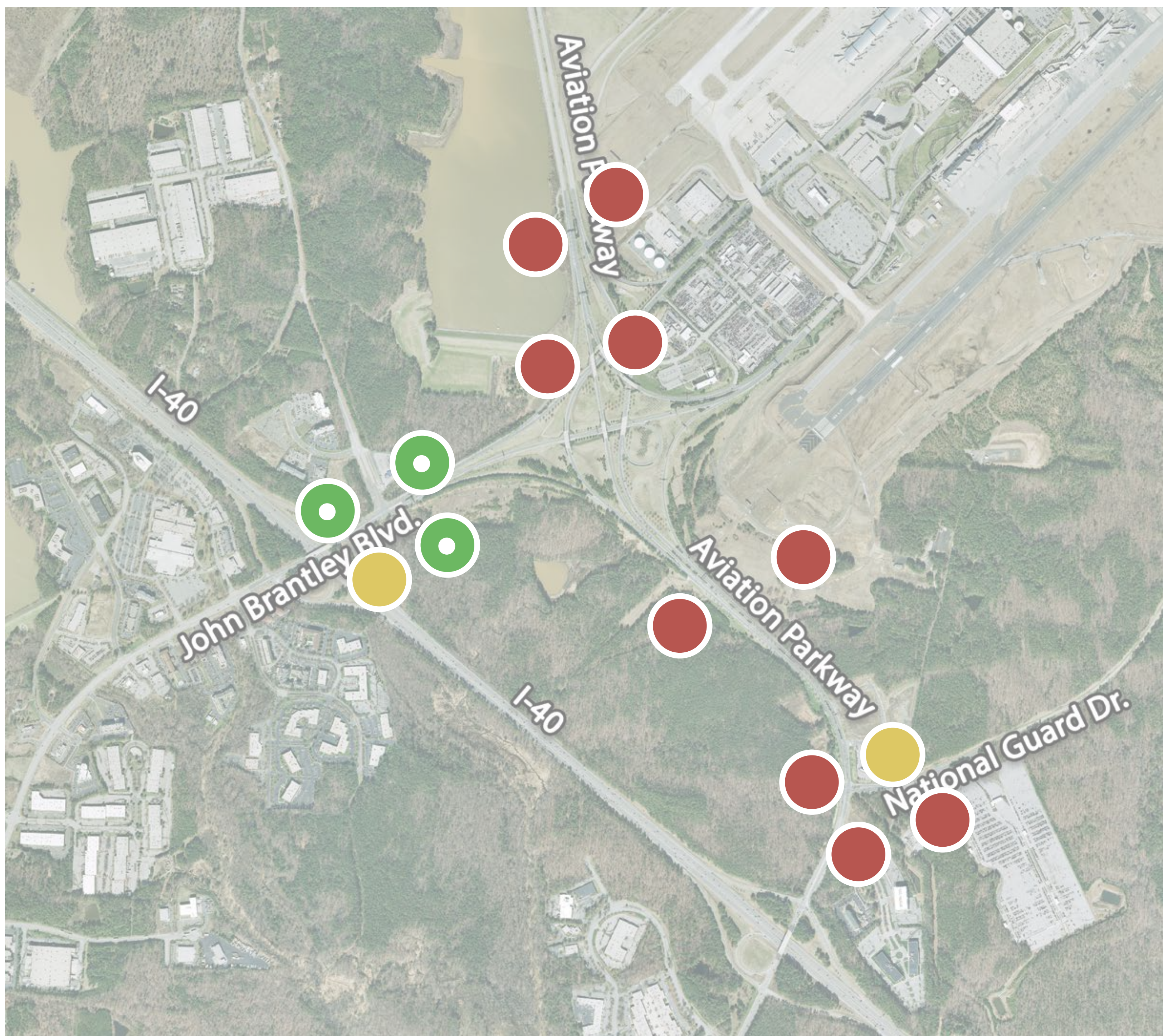■ Baseline Scenario   ■ High Scenario   — Capacity

Note: Terminal 1 Outer Roadway Curbside and Terminal 2 Lower Level Outer Roadway Curbside estimated to operate at a surplus through 2040
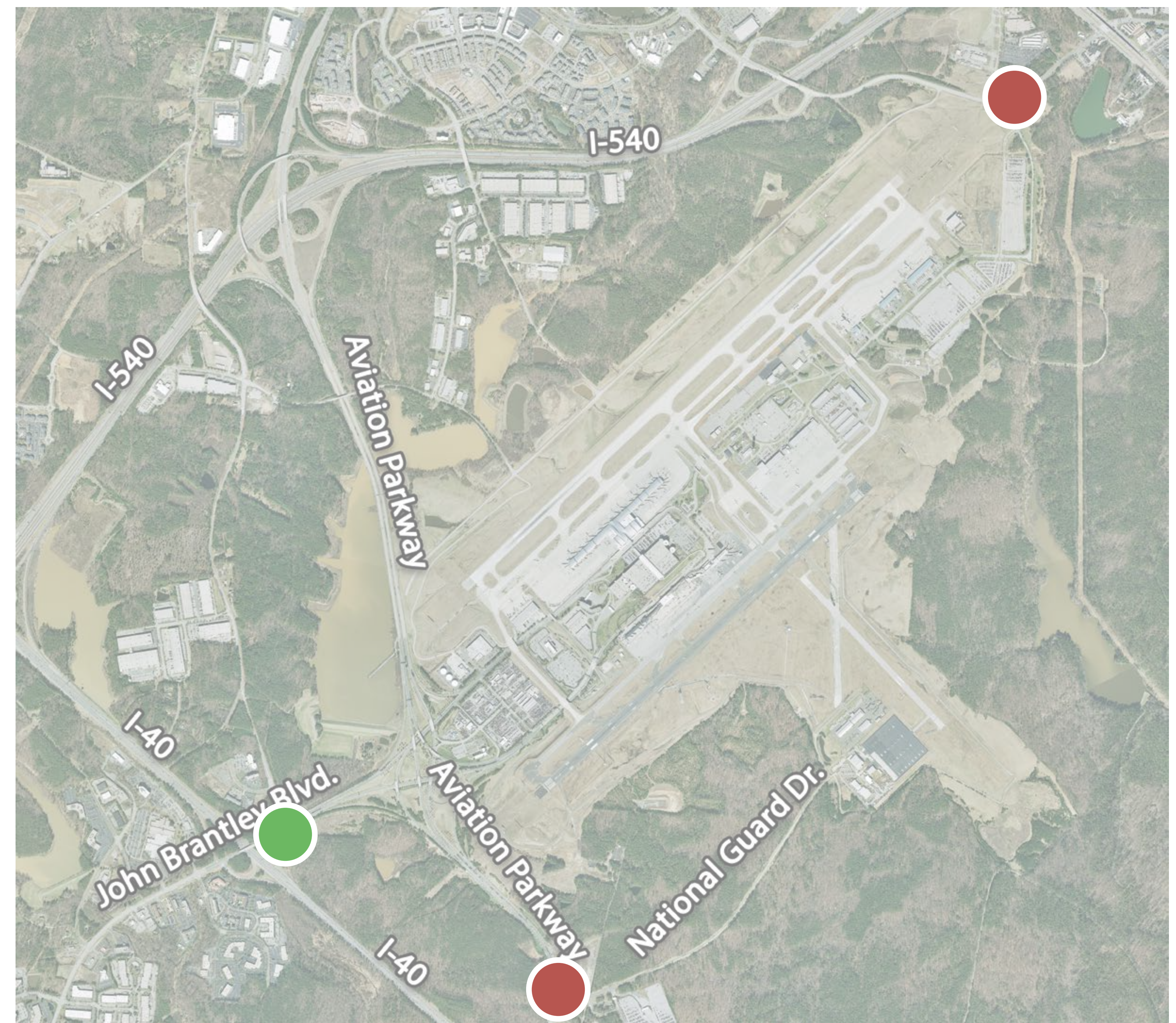
Entrance Roadways

Level of Service

A-C   D   E   F

Roadway Links - Baseline Scenario 2040

Intersections - Baseline and High Scenario 2040

Roadways are analyzed to evaluate the capacity to accommodate future Airport-related traffic

⊙ = Intersections Operate at Level of Service D in the High Scenario 2040 | NOTE: The Level of Service depicted is based on the lowest Level of Service during the AM/PM Peak Hours

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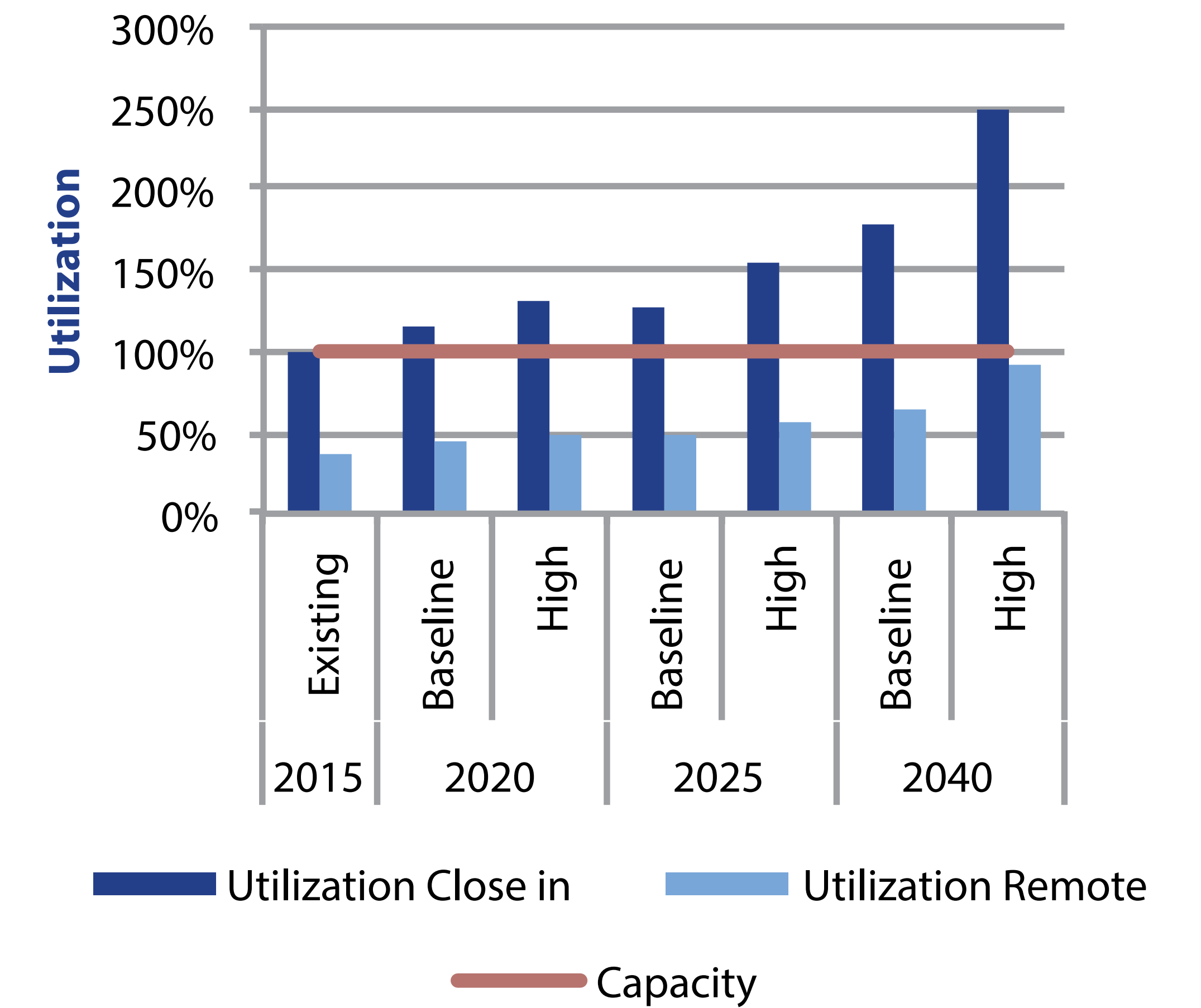
RDU **Raleigh-Durham Airport Authority**   **#rdu2040**

Landside Facilities

Public Parking

Space Utilization Close in vs. Remote

Rental Car

Component	Existing	Baseline			High		
	2015	2020	2025	2040	2020	2025	2040
Customer Service Area							
Regular Customer Service Positions	18	14	10	(6)	9	2	(30)
Ready/Return and Onsite Vehicle Spaces							
Total Ready/Return Spaces	(559)	(843)	(1,158)	(2,292)	(1,189)	(1,741)	(3,986)
Onsite Vehicle Storage Spaces	256	(52)	(393)	(1,620)	(426)	(1,023)	(3,452)
Service Sites							
Fueling Positions	(7)	(13)	(21)	(47)	(21)	(34)	(87)
Wash Bays	1	(0)	(2)	(6)	(2)	(4)	(13)
Vehicle Stacking/ Staging Spaces	1009	973	925	769	925	847	529

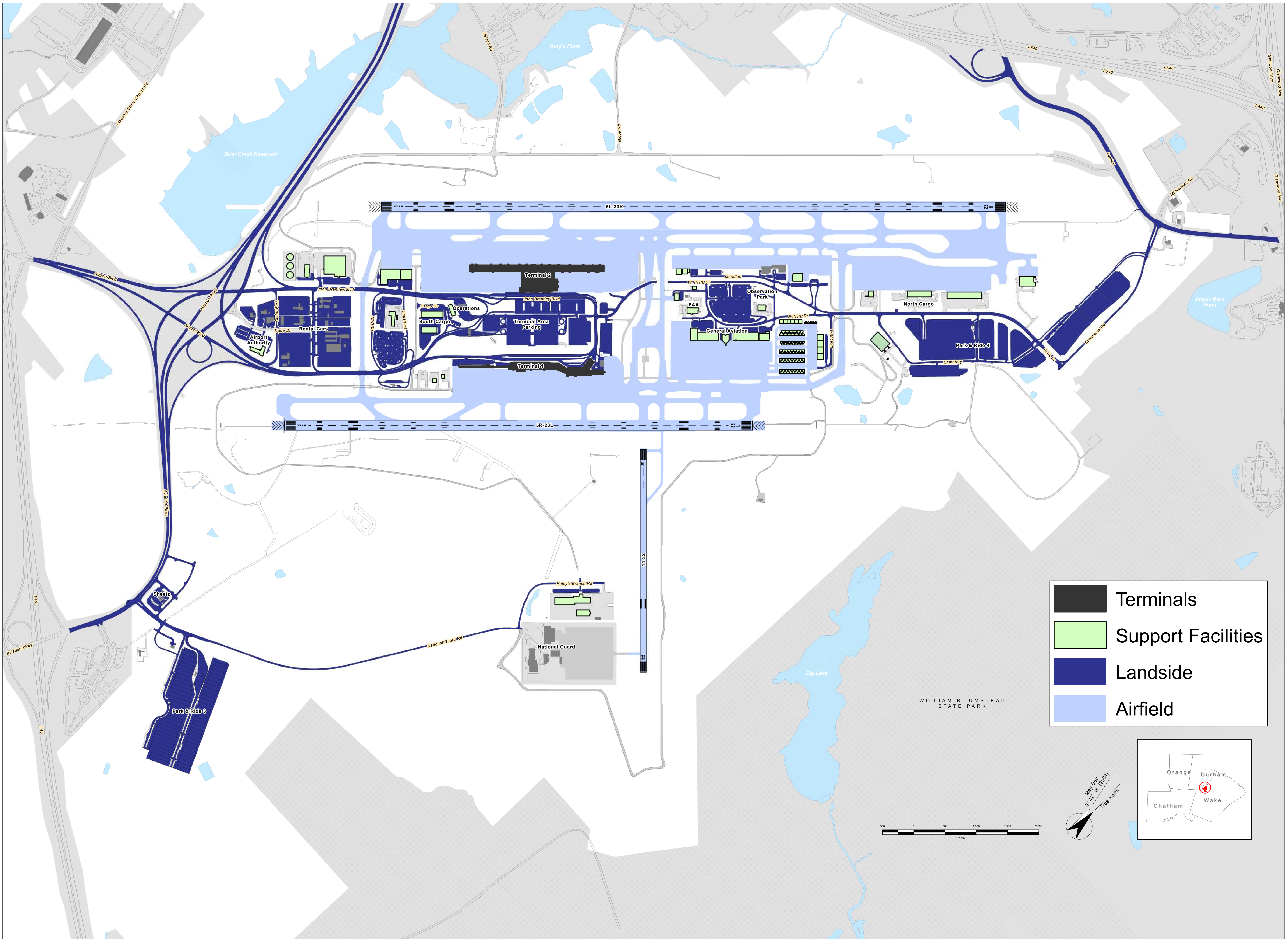(XX) = deficiency, XX = surplus

Space Demand Close in vs. Remote
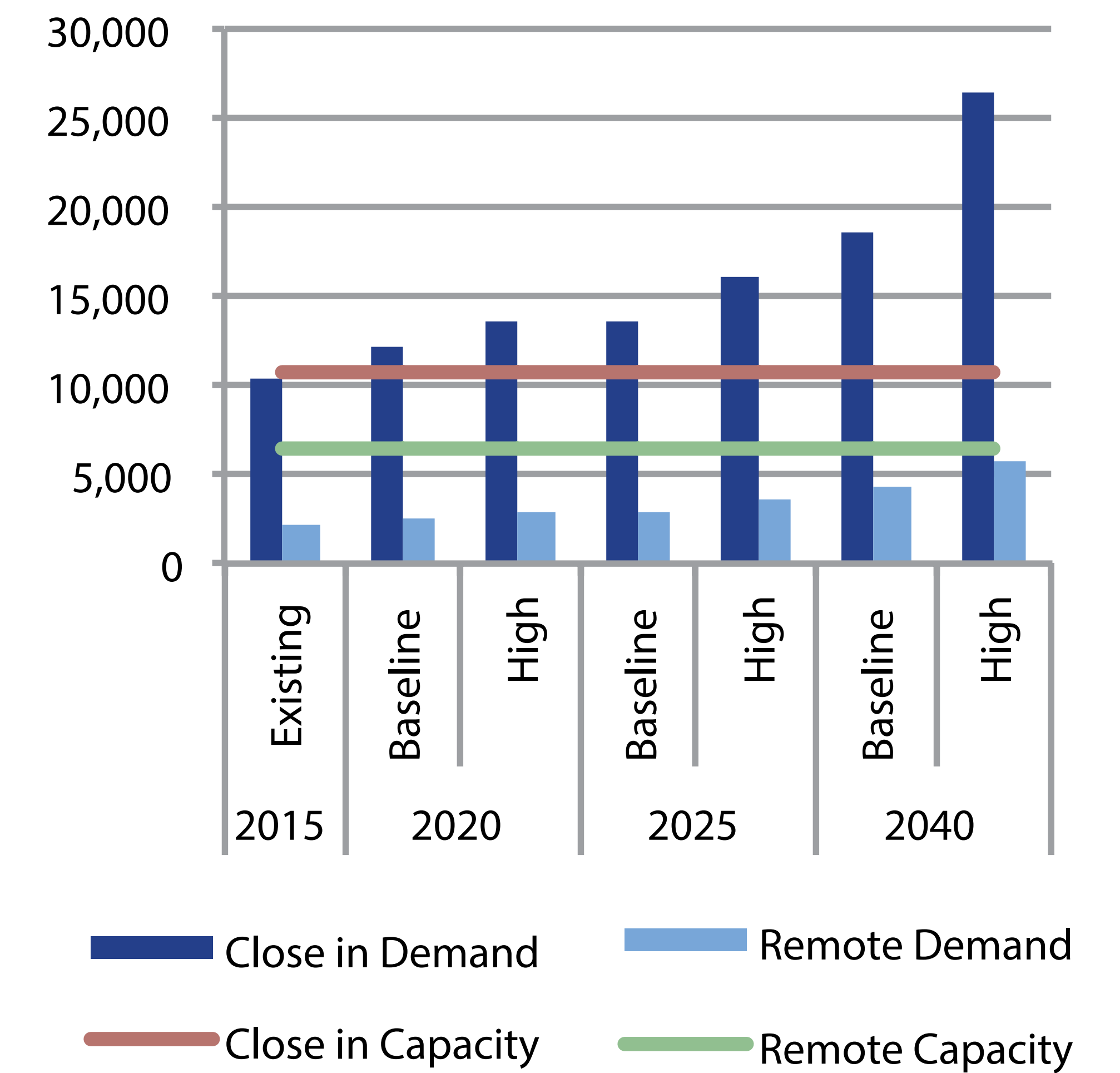
NOTE: Remote capacity only includes currently open Park and Rides (Park and Ride 3 & 4)

General Aviation and Cargo

● Additional Space Required

	Baseline				High			
	2015	2020	2025	2040	2015	2020	2025	2040
General Aviation								
FBO & Corporate Hangars	●	●	●	●	●	●	●	●
T-Hangars	●	●	●	●	●	●	●	●
Tie Downs		●	●	●		●	●	●
Itinerant Aircraft Parking								
GA Fuel								
Cargo								
Belly Cargo - All Functions								
Cargo Integrator								
Building	●	●	●	●	●	●	●	●
Parking	●	●	●	●	●	●	●	●
Truck Dock	●	●	●	●	●	●	●	●
Freight Cargo								
Building								
Aircraft Apron		●	●	●		●	●	●
Parking								
Truck Dock	●	●	●	●	●	●	●	●

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Legend

- **Terminals** (black)
- **Support Facilities** (green)
- **Landside** (dark blue)
- **Airfield** (light blue)

Runway 5L-23R

Runway 5R-23L

Runway 14-32

Terminal 2

Terminal 1

Terminal Area Parking

South Cargo

North Cargo

Operations

Cargo Dr

Rental Cars

Airport Authority

General Aviation

Observation Park

FAA

Meridian

W INT'L Dr

E INT'L Dr

Executive

Park & Ride 4

Park & Ride 3

Cemetery

National Guard

Haley's Branch Rd

National Guard Rd

Sheetz

Aviation Pkwy

Airport Blvd

John Brantley Blvd

Trade Dr

Commerce Rd

I-540

I-40

Nelson Rd

Globe Rd

Pleasant Grove Church Rd

Glenwood Ave

Mt Herman Rd

King's Pond

Brier Creek Reservoir

Angus Barn Pond

Big Lake

WILLIAM B. UMSTEAD STATE PARK

Mag. Dec. 8° 42' W (2004)
True North

Orange Durham
Chatham Wake

500 0 500 1,000 1,500 2,000

1" = 500

Raleigh-Durham Airport Authority

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