



Master Plan Refinement Forecast and Overview

DENVER INTERNATIONAL AIRPORT
January 25, 2016

Master Plan Refinement

- Overall goals of the Master Plan Refinement (MPR):
 - Work with DEN to refine the preferred airport development plan to guide the development over an approximate 25-year planning horizon (2040)
 - Revalidation of the development concept for DEN as shown in the Master Plan Update from 2011
 - Update the inventory, forecast, facility requirements, demand triggers, and implementation plan
 - Balance facility needs with consideration of financial impacts to users, flexibility to accommodate various changes, and consistency with the City's and DEN's Strategic Plan

Forecast Update

- A forecast of activity through 2040 is being prepared as part of the MPR
- MPR forecast is being developed to account for industry and economic changes that are likely to affect DEN:
 - United Airlines recent re-banking of its DEN hub
 - Southwest Airlines growth
 - Frontier Airlines evolving business model and capacity reduction at DEN
 - Airline industry consolidation
 - Increase in load factors and average seats per aircraft
 - Recovery of passenger demand after the Great Recession

Forecast Process – Enplaned Passengers

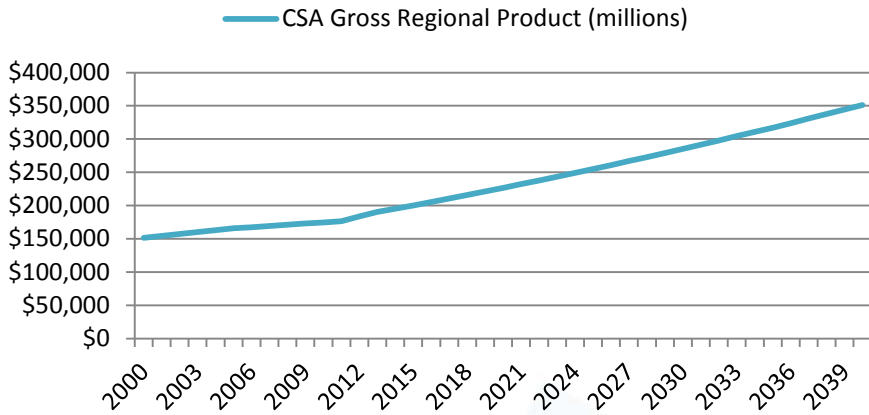
- Steps for high-level enplaned passenger forecast (short-term 2015-2016):
 - Compiled DEN month-by-month schedule detail by airline for 2014, 2015, and 2016 (available through July 2016)
 - Matched historical airport activity data (available through July 2015) to airline schedule data
 - Used historical performance and trends to project activity for August 2015 through December 2016 by airline

Forecast Process – Enplaned Passengers

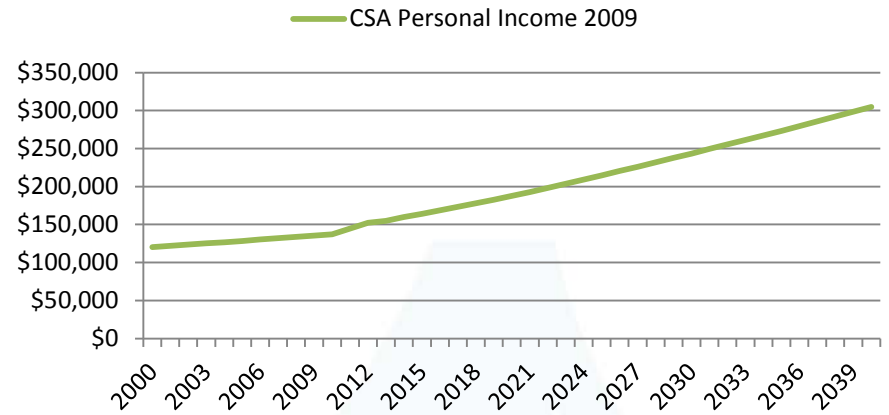
- Steps for high-level enplaned passenger forecast (long-term 2017-2040):
 - Segmented historical passenger traffic served by DEN
 - International and domestic origin and destination (O&D) passengers
 - Connecting passengers
 - Identified causal relationships between O&D passenger volumes and various socioeconomic data using regression analysis
 - Used regression models representing causal relationships to forecast O&D passenger volumes through 2040
 - Apportioned O&D passengers across airlines through 2040 according to estimated 2015 share - assumed constant airline market share of O&D passengers through 2040
 - Identified historical ratios of connecting passengers to O&D passengers by airline and used 2015 Airport data to determine how ratios have changed over time given recent carrier evolution at DEN
 - Calculated connecting passenger volumes by airline in accordance with the ratios of connecting to O&D passengers (i.e., assumed airlines at DEN continue to operate similar to 2015 characteristics)

Economic Inputs Considered

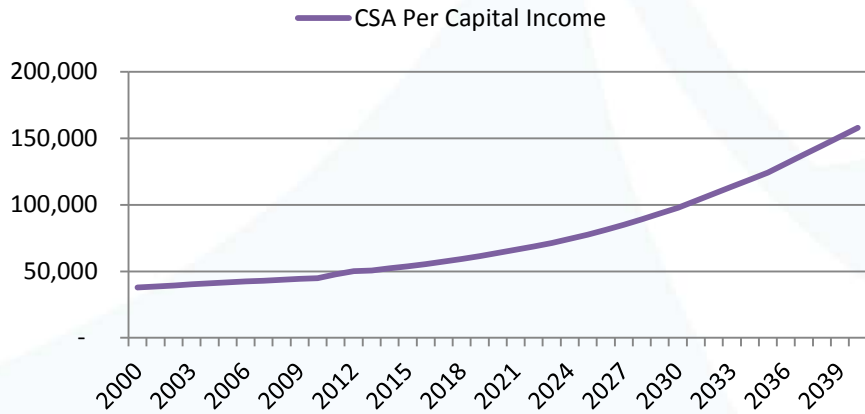
CSA Gross Regional Product (millions)



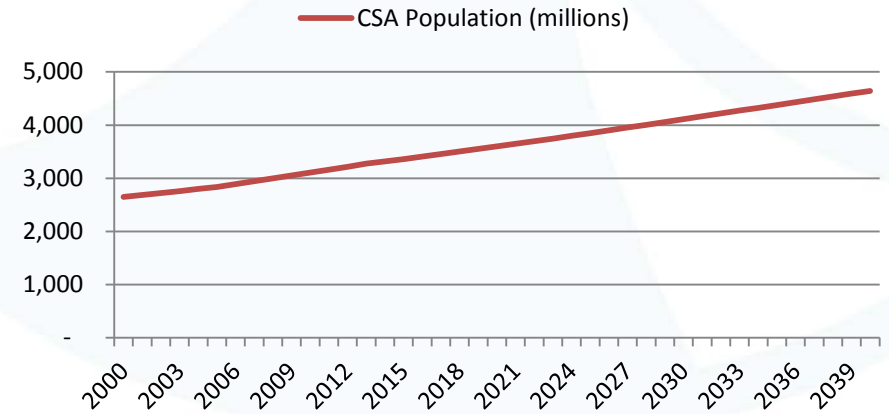
CSA Personal Income 2009



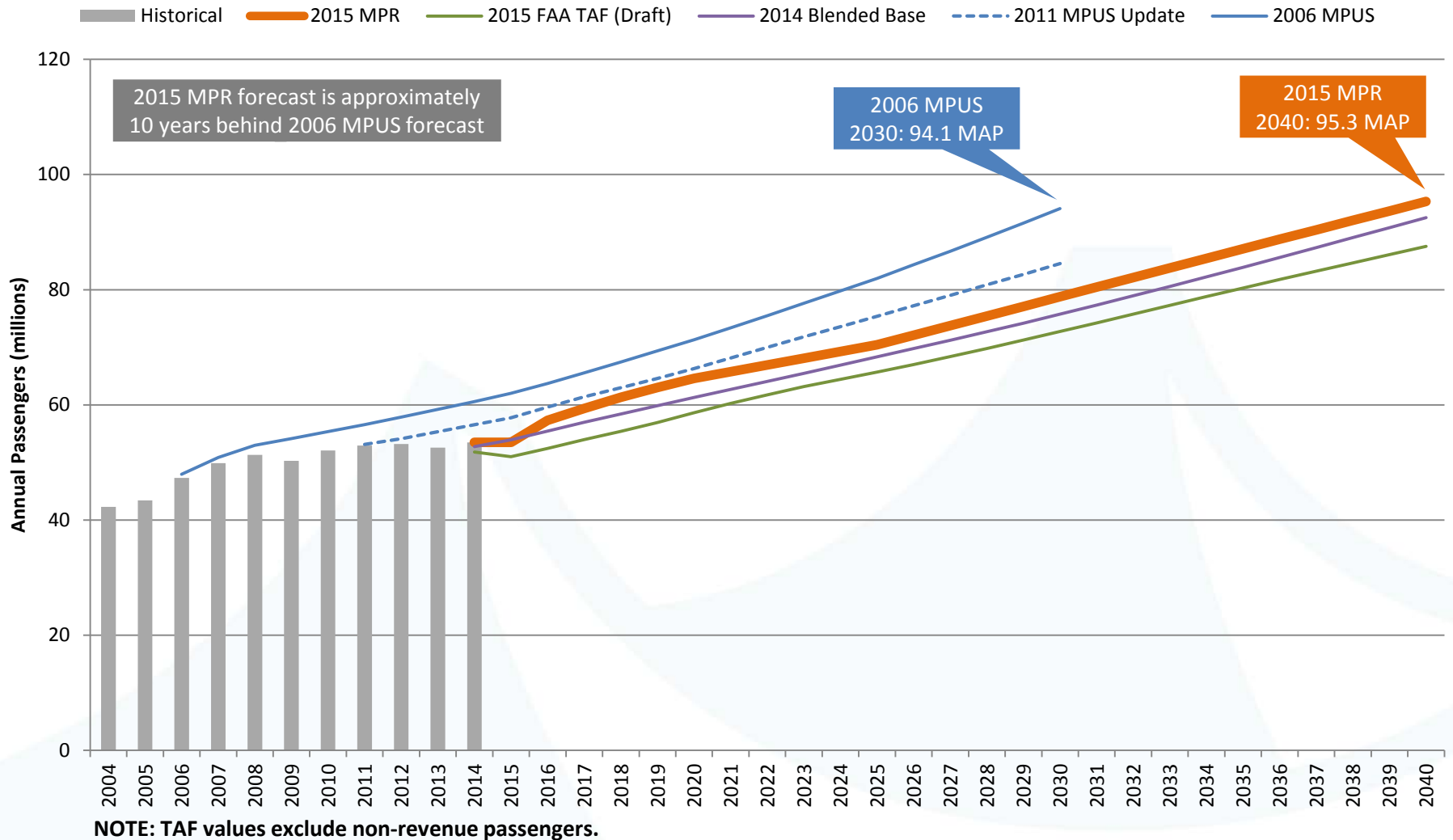
CSA Per Capita Personal Income



CSA Population (millions)

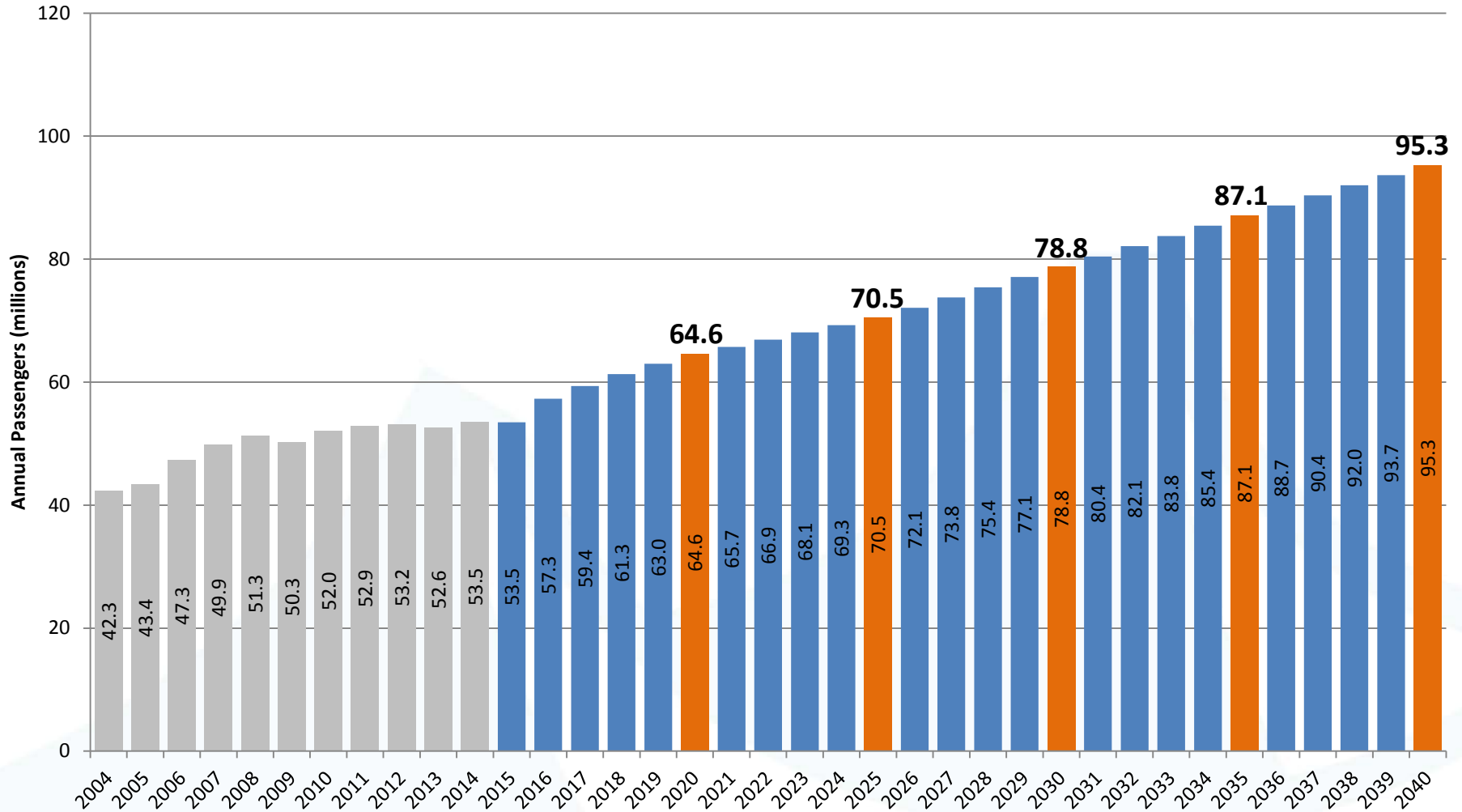


Annual Passenger Comparison



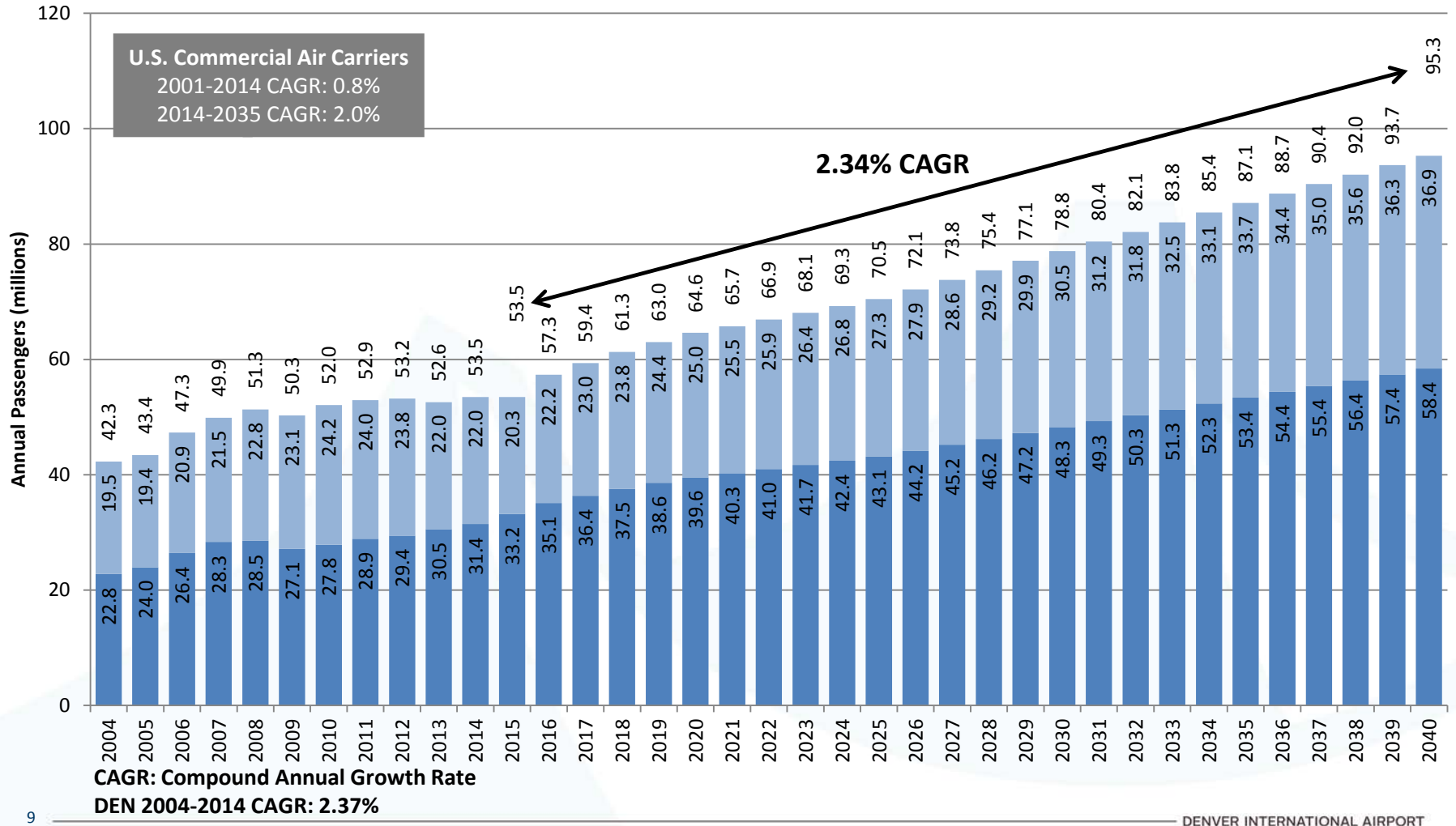


MPR Base Forecast: Annual Passengers

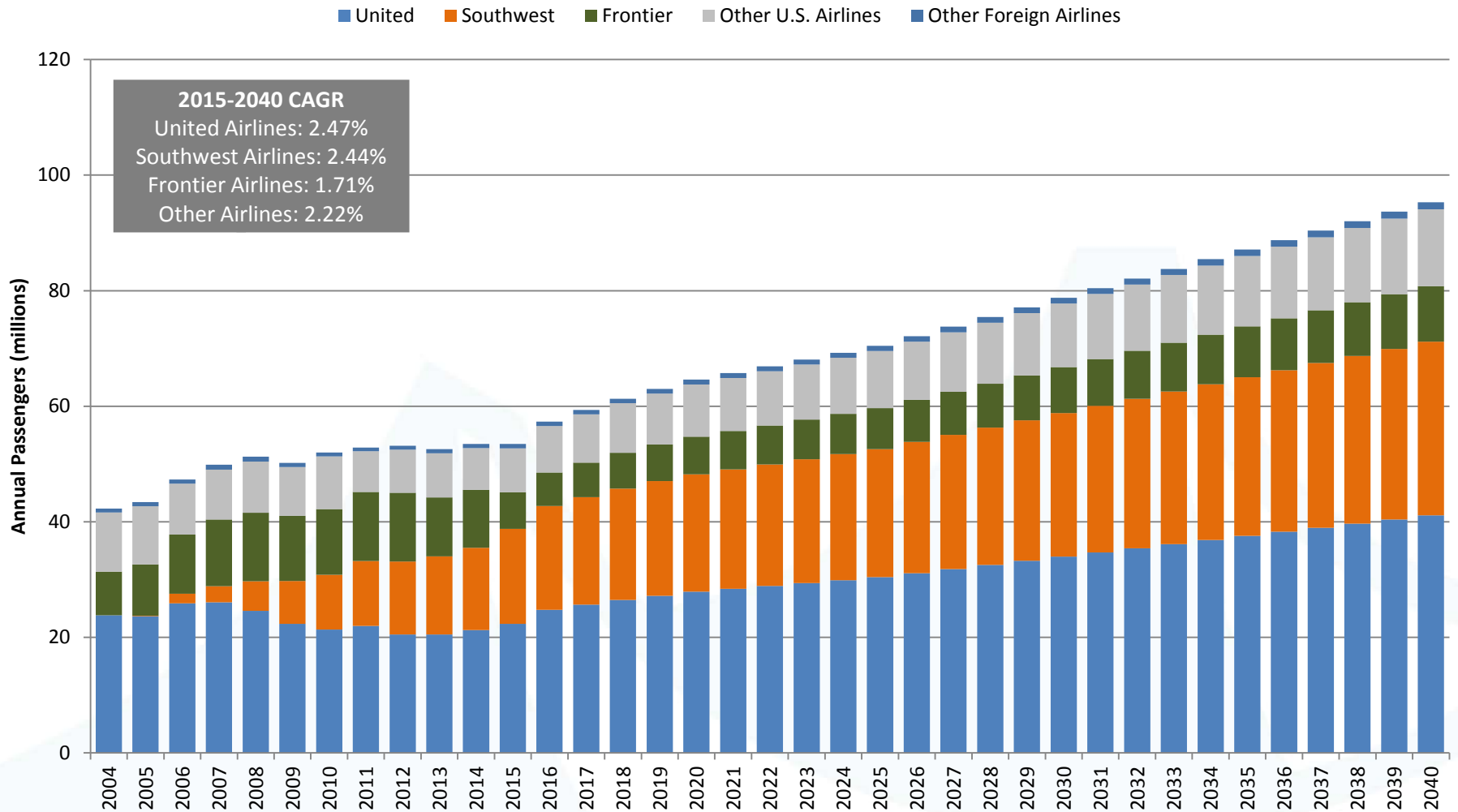


MPR Base Forecast: Annual Passengers

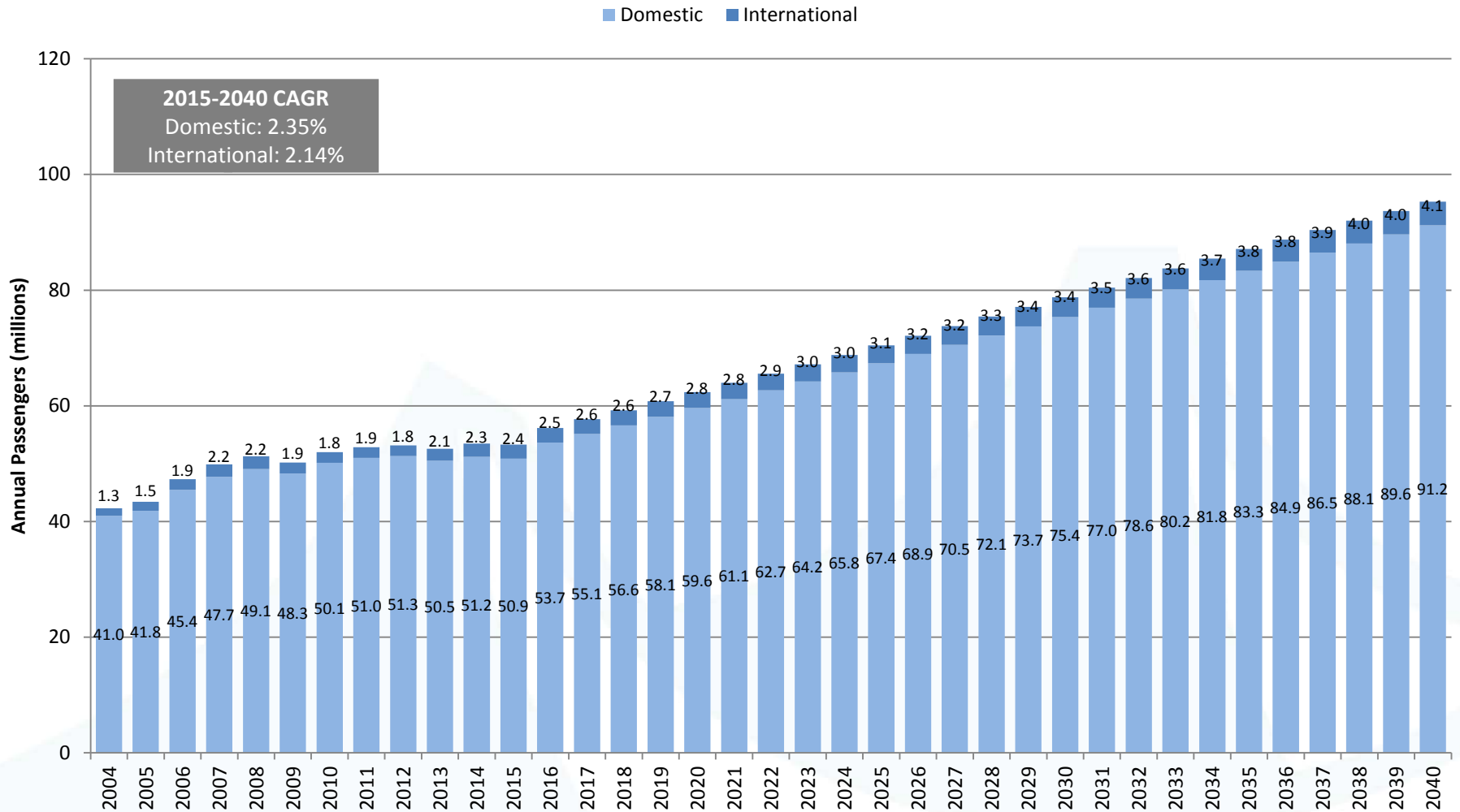
■ 2015 MPR Originating and Destination ■ 2015 MPR Connecting



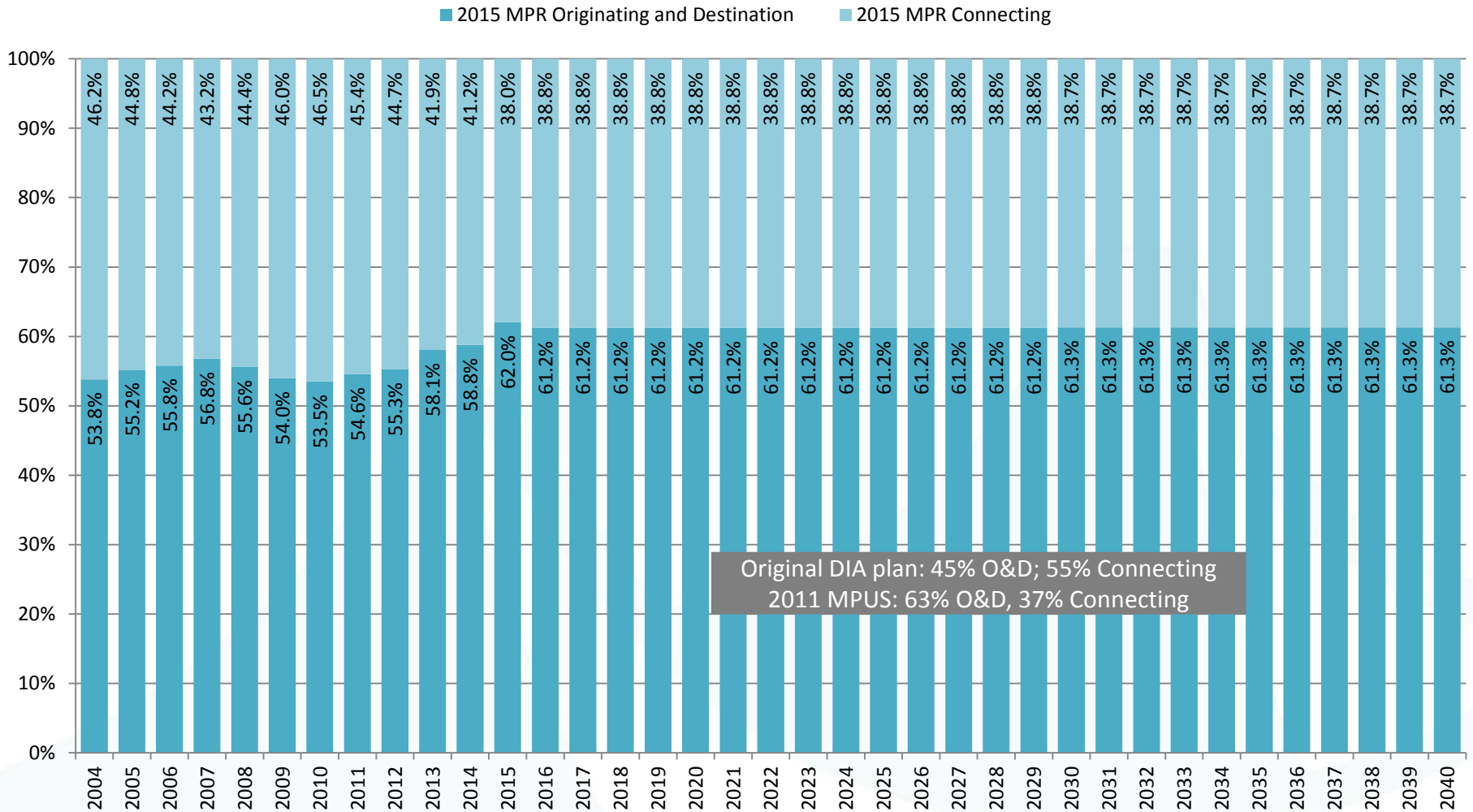
MPR Base Forecast: Annual Passengers



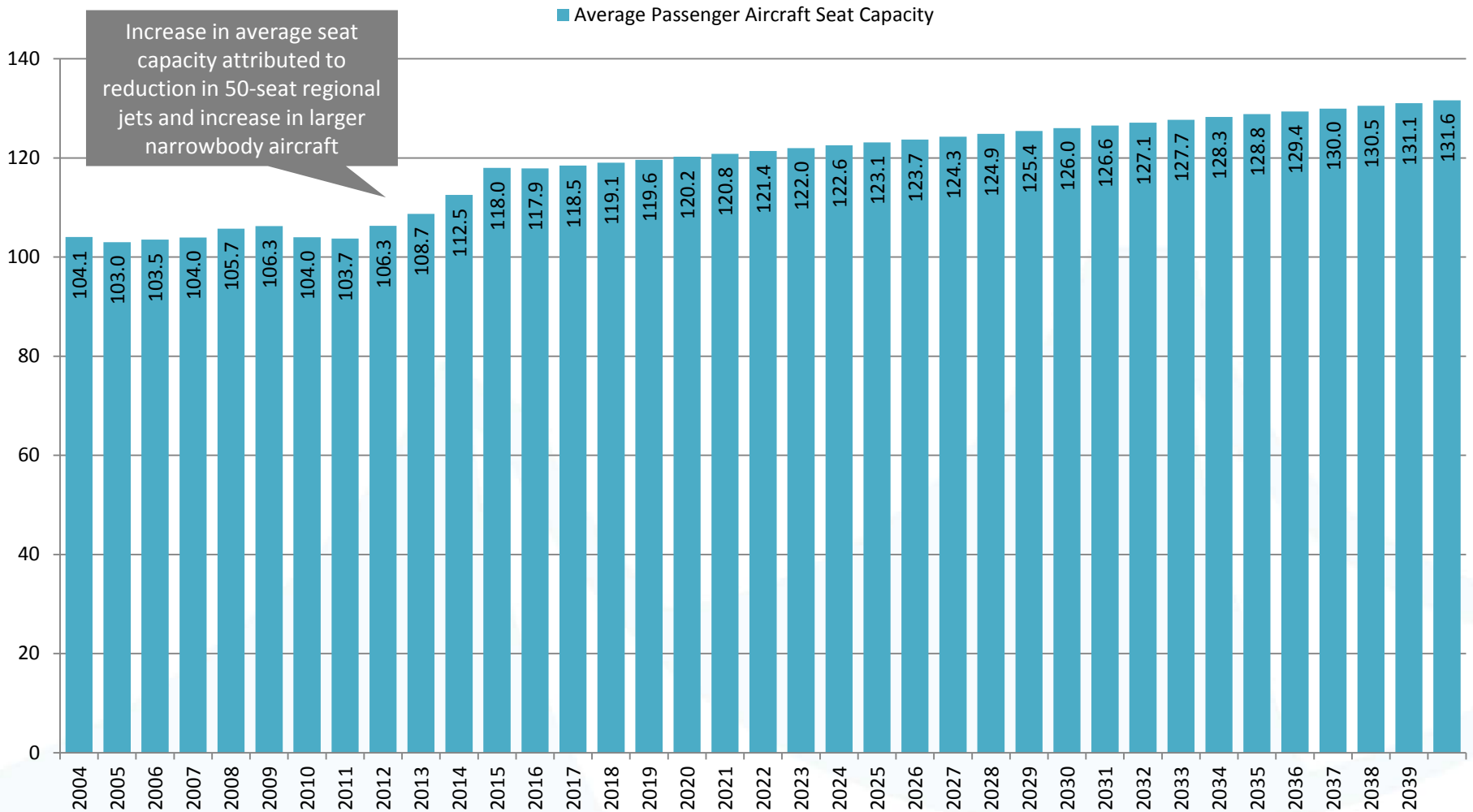
MPR Base Forecast: Annual Passengers



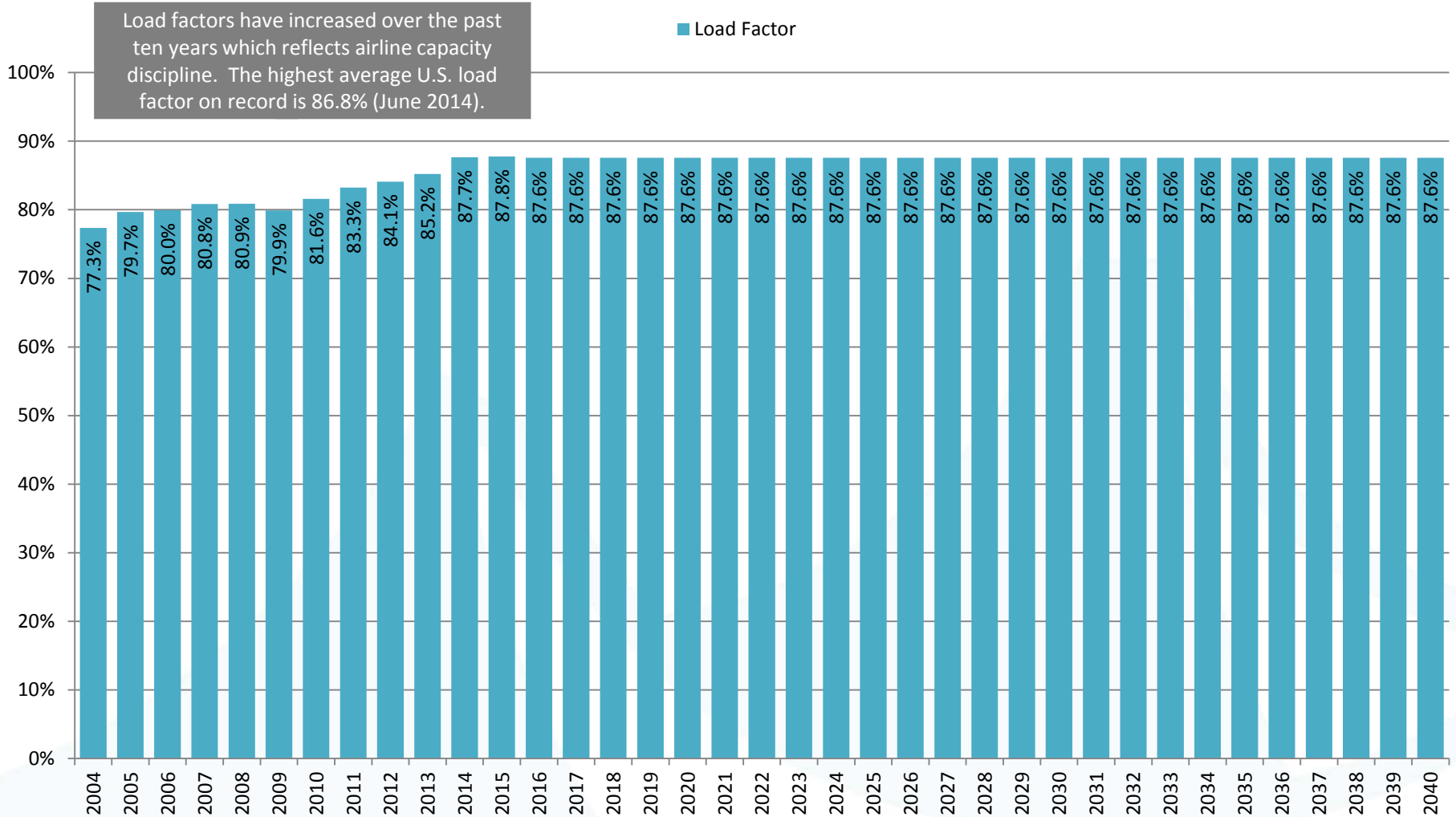
MPR Base Forecast: O&D vs. Connecting



MPR Base Forecast: Average Aircraft Seat Capacity



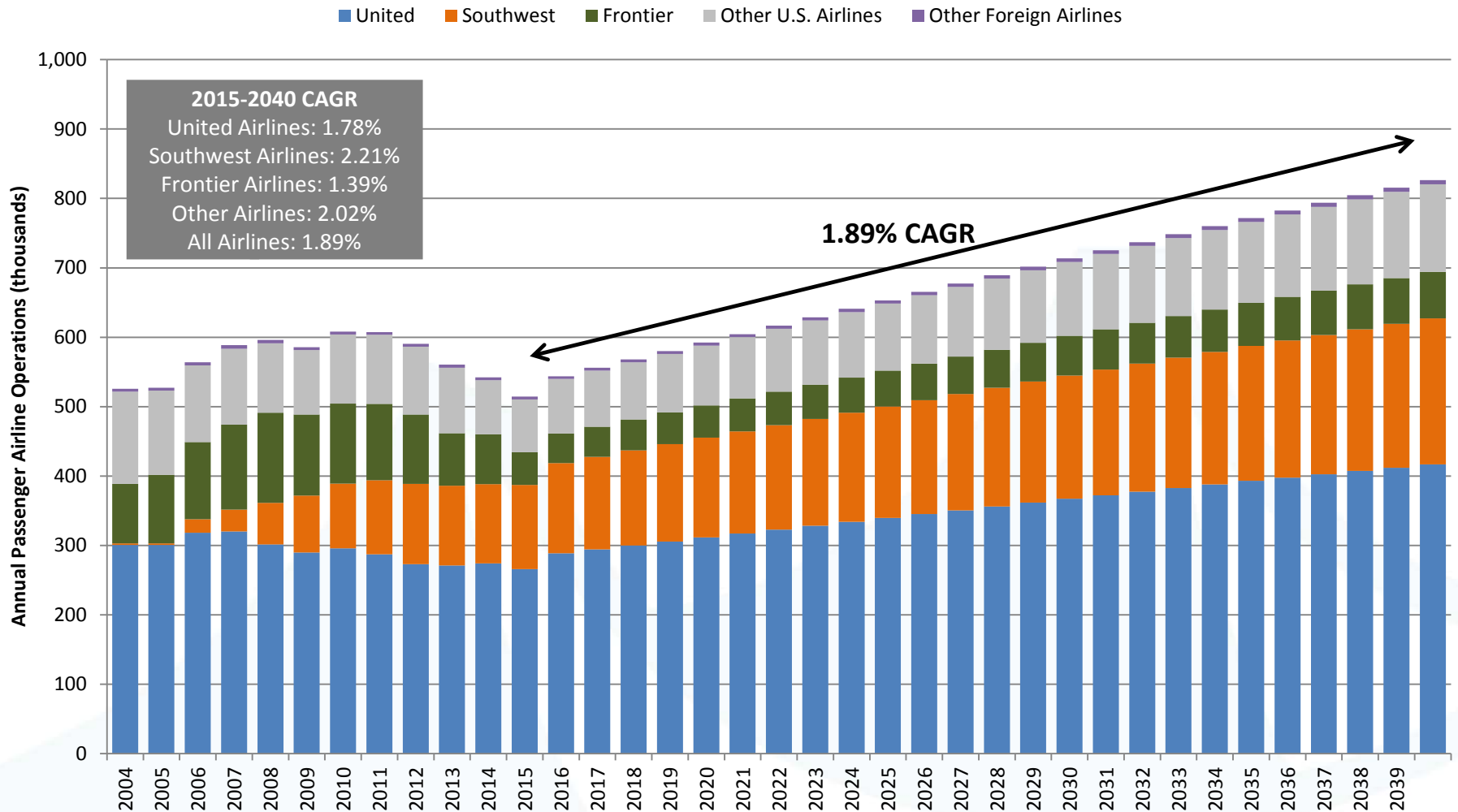
MPR Base Forecast: Average Load Factor



Forecast Process – Passenger Airline Operations

- Steps for high-level passenger airline operations forecast (short-term 2015-2016):
 - Compiled DEN month-by-month schedule detail by airline for 2014, 2015, and 2016 (available through July 2016)
 - Matched historical airport activity data (available through July 2015) to airline schedule data
 - Used historical performance and trends to project activity for August 2015 through December 2016 by airline
- Steps for high-level passenger airline operations forecast (long-term 2017-2040):
 - Analyzed historical trends in operations performance at DEN by airline, separately for domestic and international flight segments
 - Developed by-airline assumptions regarding future average aircraft size, load factor performance, and completion rates considering industry and airport-specific trends
 - Applied assumptions to forecasts of passenger growth, resulting in airline-specific passenger operations in an unconstrained environment (assuming no airside or landside constraints)

MPR Base Forecast: Airline Operations



Design Day Flight Schedules

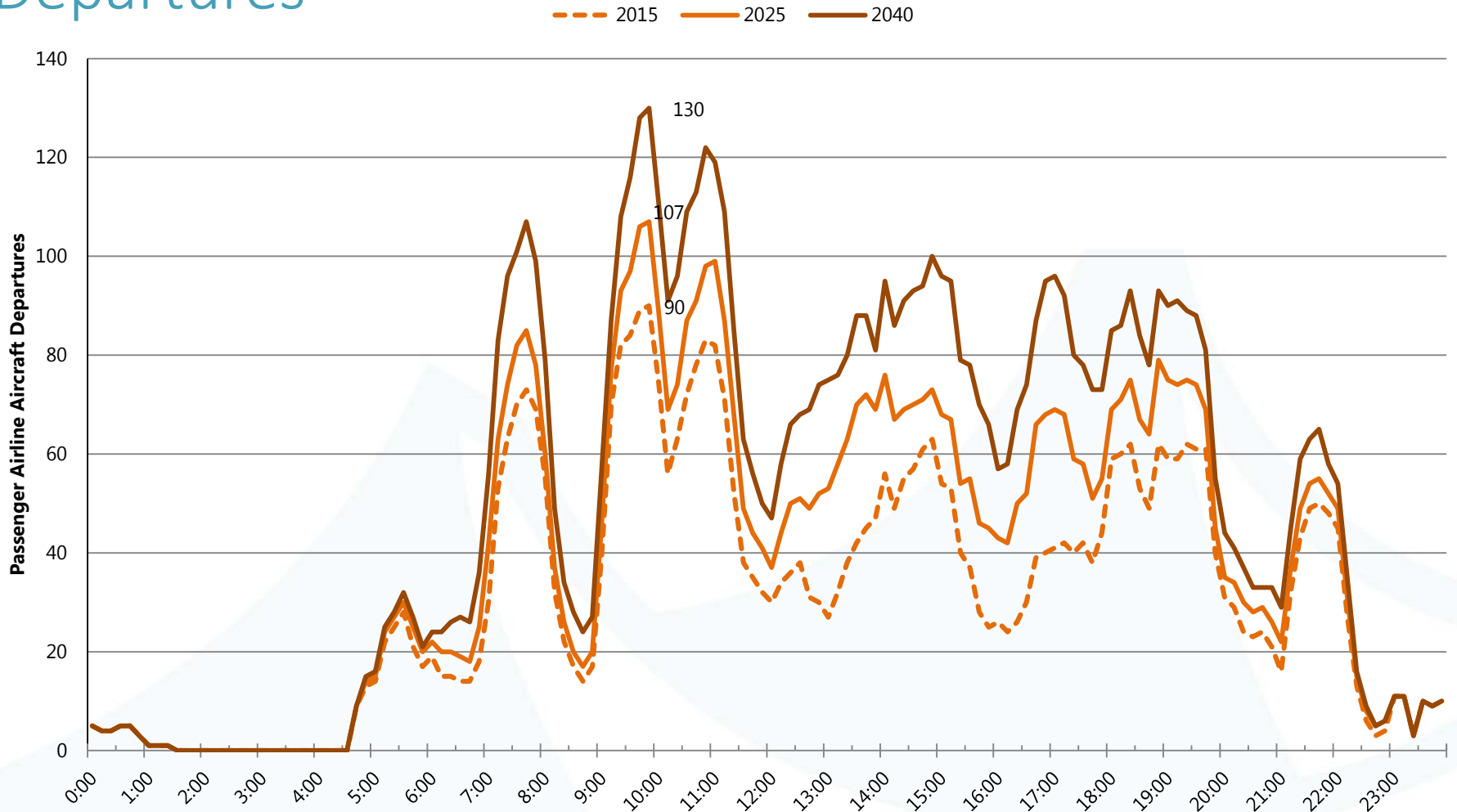
- Design day flight schedules (DDFS) were developed for 2015, 2025, and 2040.
- Table summarizes number of daily and peak rolling hour passengers and airline operations in the schedules.
- The selected design day (peak month average day) is Thursday, July 16, 2015. This schedule is used as a base for future schedules.
- The peak month for international passengers is March. A design day flight schedule for international activity in March is pending.

	2015	2020 ^{1/}	2025	2030 ^{1/}	2035 ^{1/}	2040
Annual Passengers	53,473,368	64,590,889	70,450,629	78,781,316	87,103,303	95,305,327
Annual Airline Operations	517,449	613,278	653,128	713,741	771,803	826,553
Daily						
Deplaned Passengers	80,934	98,084	107,123	119,798	132,460	144,939
Terminating Passengers	51,547	61,881	67,328	75,374	83,411	91,332
Connecting Arriving Passengers	29,387	36,203	39,795	44,425	49,049	53,607
Arriving Seats	91,788	111,878	122,467	135,557	148,633	161,520
Enplaned Passengers	80,482	97,543	106,536	119,142	131,736	144,147
Originating Passengers	51,006	61,252	66,652	74,802	82,944	90,969
Connecting Departing Passengers	29,476	36,292	39,884	44,340	48,791	53,178
Departing Seats	92,095	112,172	122,754	135,826	148,884	161,754
Operations	1,549	1,846	1,969	2,151	2,326	2,491
Arriving Operations	773	921	983	1,074	1,162	1,244
Departing Operations	776	924	986	1,077	1,165	1,247
Peak Rolling Hour						
Deplaned Passengers	8,730	9,935	10,570	11,511	12,450	13,376
Terminating Passengers	5,135	5,690	5,982	6,497	7,012	7,519
Connecting Arriving Passengers	3,868	4,452	4,759	5,260	5,761	6,254
Enplaned Passengers	8,891	10,351	11,120	12,363	13,605	14,829
Originating Passengers	5,508	6,397	6,865	7,679	8,493	9,294
Connecting Departing Passengers	4,005	4,613	4,934	5,479	6,024	6,560
Operations	155	176	185	202	218	233
Arriving Operations	88	98	102	108	114	119
Departing Operations	90	102	107	115	123	130

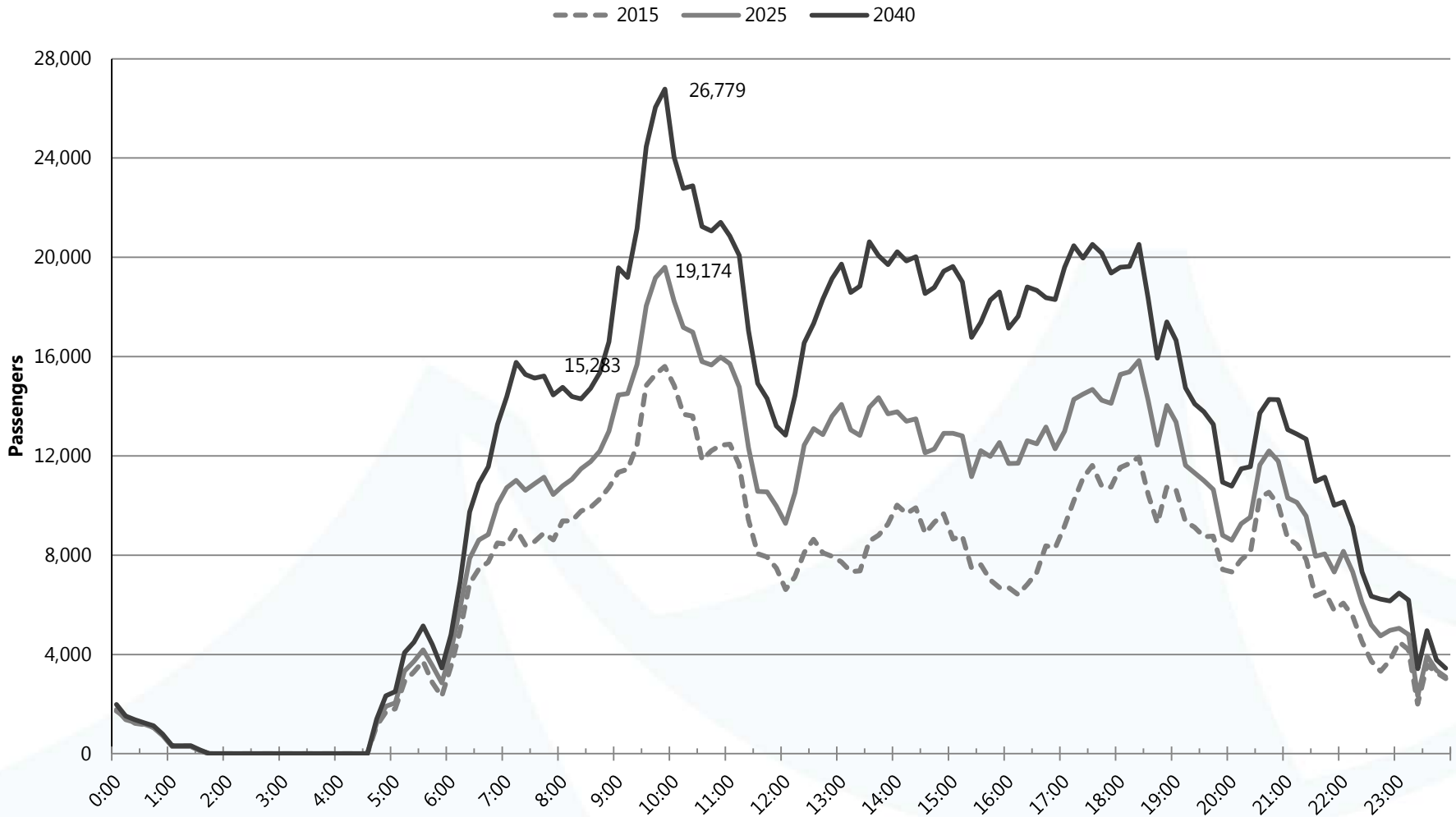
Note:

1/ Design day activity for the years 2020, 2030 and 2035 interpolated based on annual growth and design day flights schedules developed for 2015, 2025, and 2040.

DDFS: Rolling Hour Passenger Airline Aircraft Departures



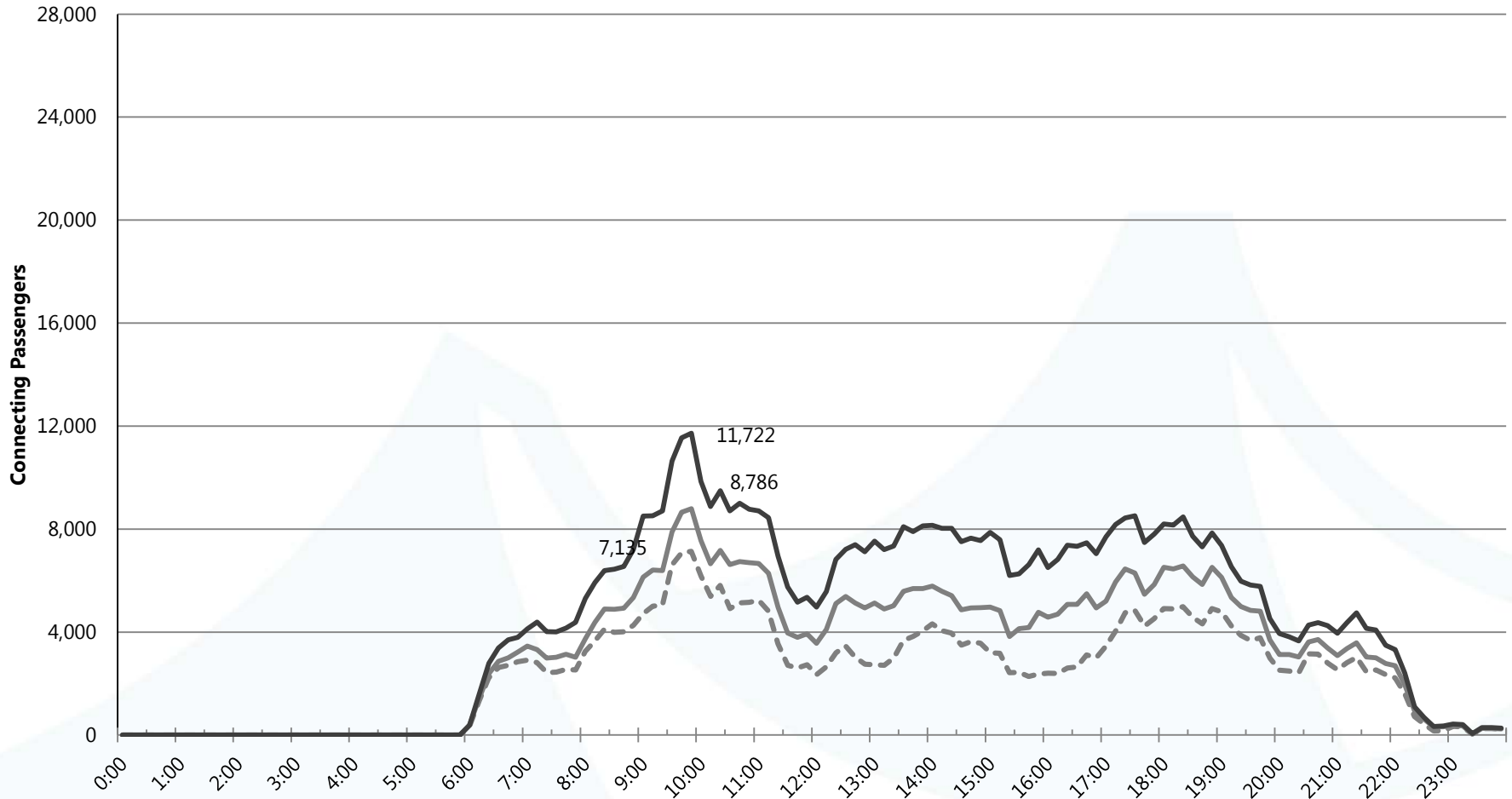
DDFS: Rolling Hour Passengers





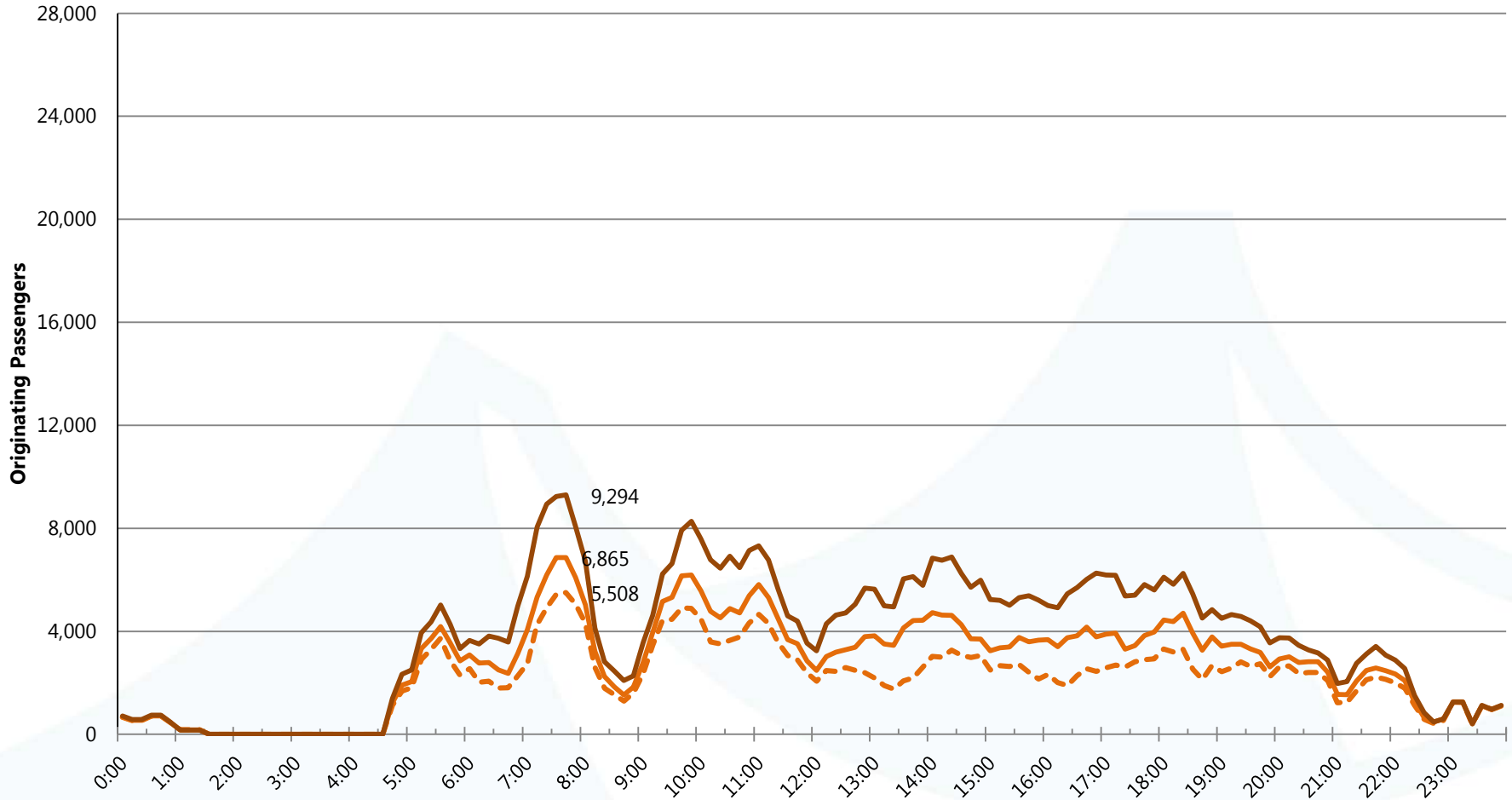
DDFS: Rolling Hour Connecting Passengers

--- 2015 — 2025 — 2040



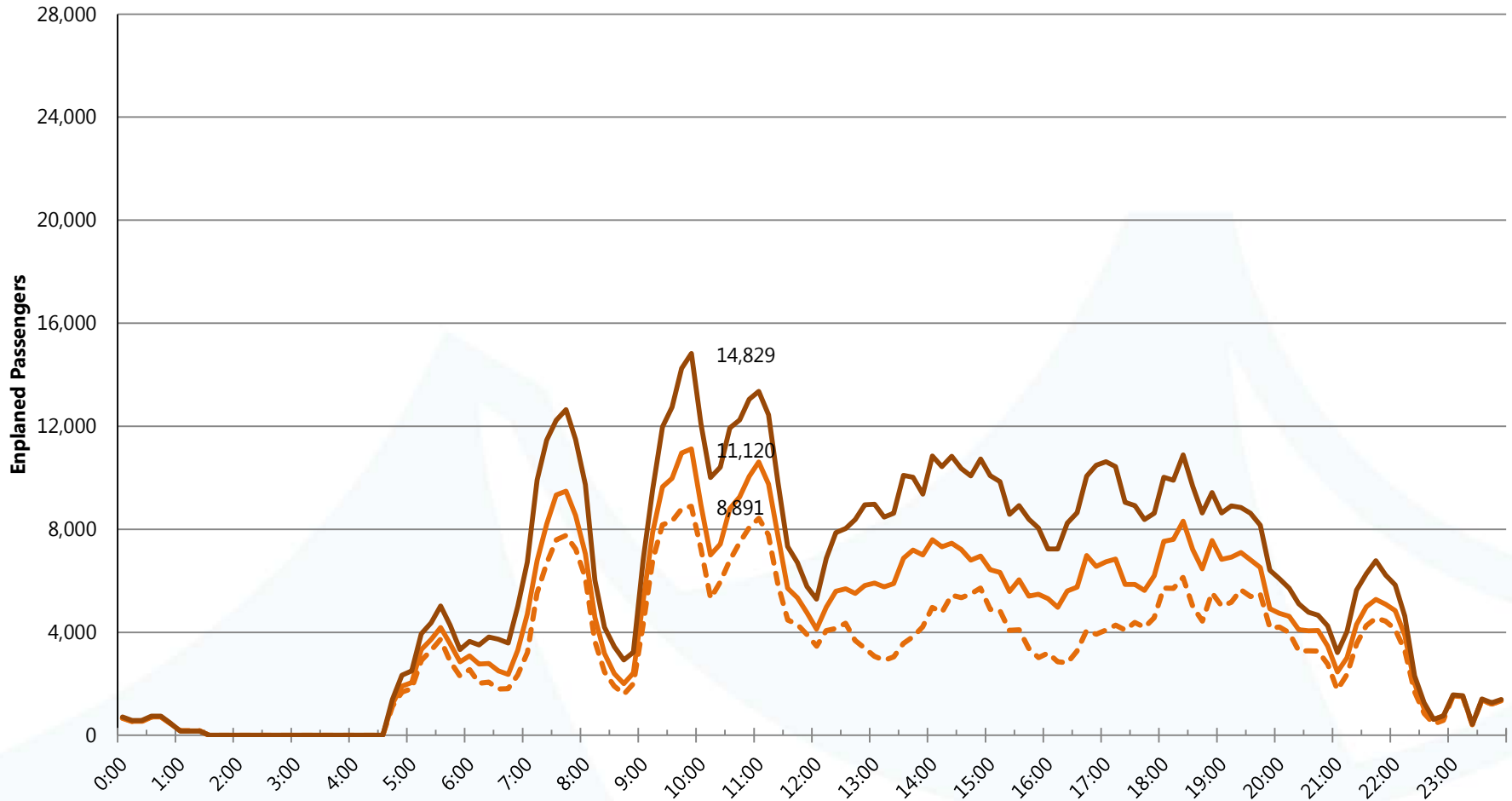
DDFS: Rolling Hour Originating Passengers

--- 2015 — 2025 — 2040



DDFS: Rolling Hour Enplaned Passengers

--- 2015 — 2025 — 2040



Master Plan Refinement Next Steps

- Use annual forecast and design day activity to generate facility requirements
- Determine capacity needs and timing
- Review 2011 MPUS alternatives and define supplemental development concepts
- Evaluate and identify overall development concept for the Airport
- Prepare implementation plan

Facilities Considered in MPR:

- Airfield
 - Runways
 - Taxiways
- Terminal
 - Concourses
 - Gates
- Landside
 - Terminal curbsides
 - Roadways
 - Rental car
 - Parking (public and employee)
- Support Facilities