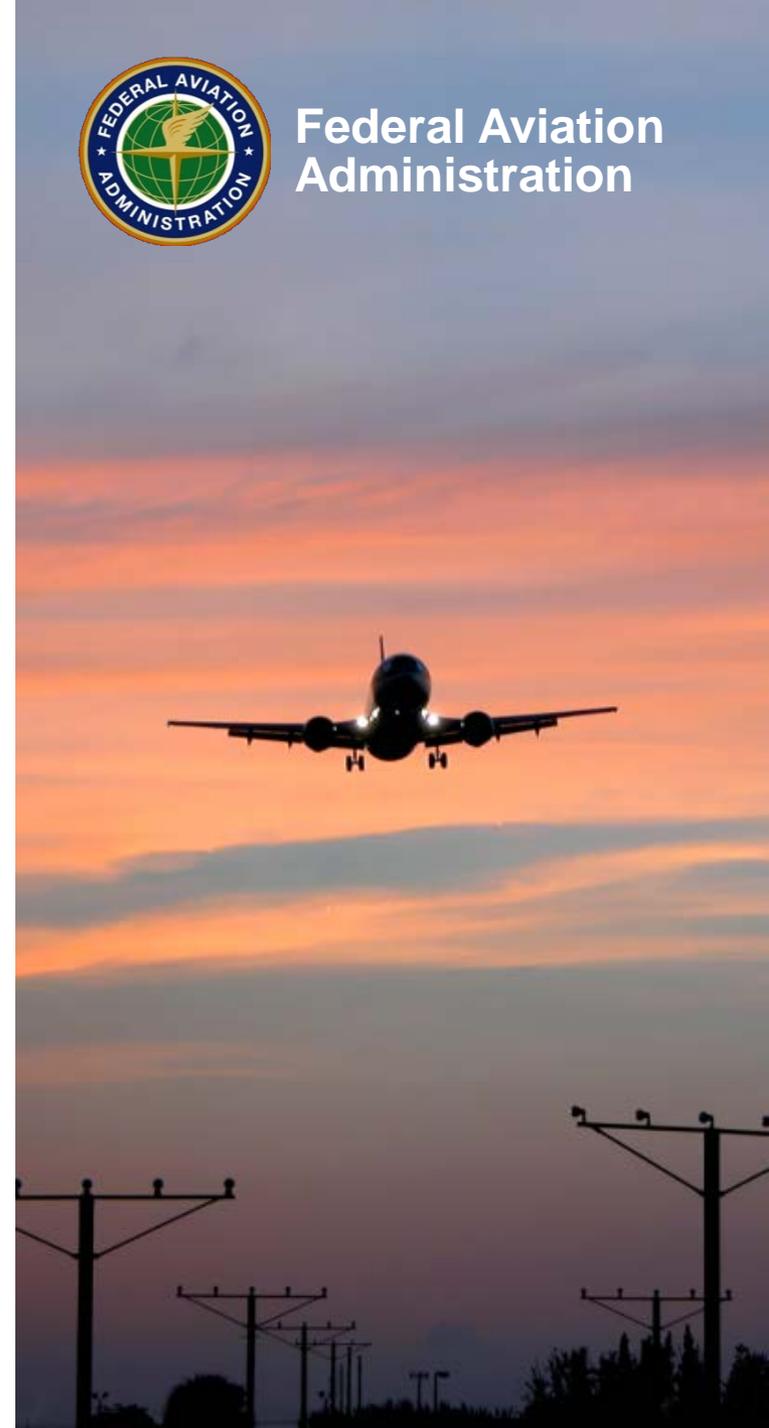# Forecast Update

Federal Aviation Administration

Presented to 10th National Aviation System Planning Symposium

May 21, 2018

Kent Duffy, FAA Office of Airports
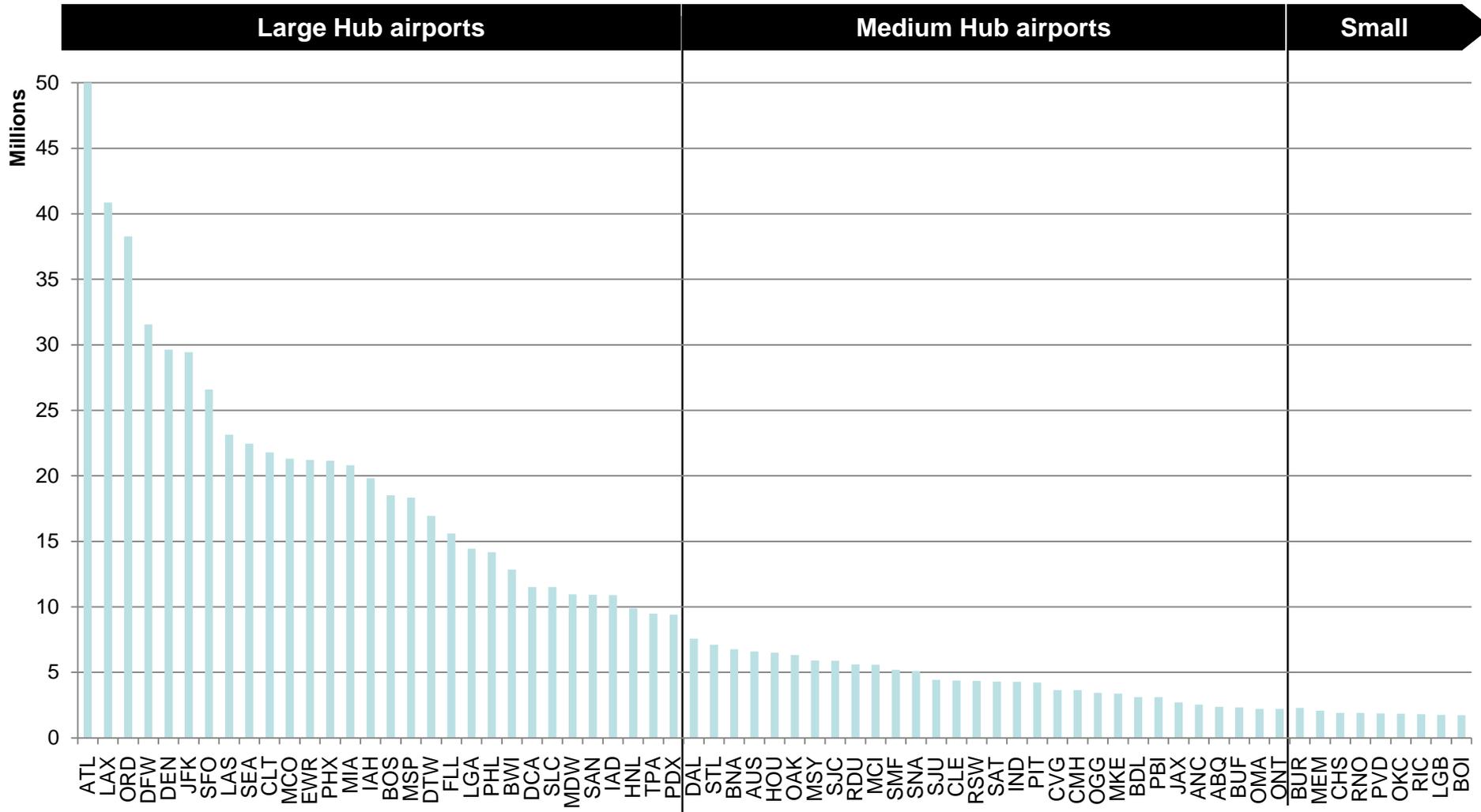National Planning & Environmental Division, APP-400

Agenda

- **Trends**
- **Forecasts**
- **Critical Aircraft**

Annual Enplanements by Airport (FY17)

Federal Aviation Administration
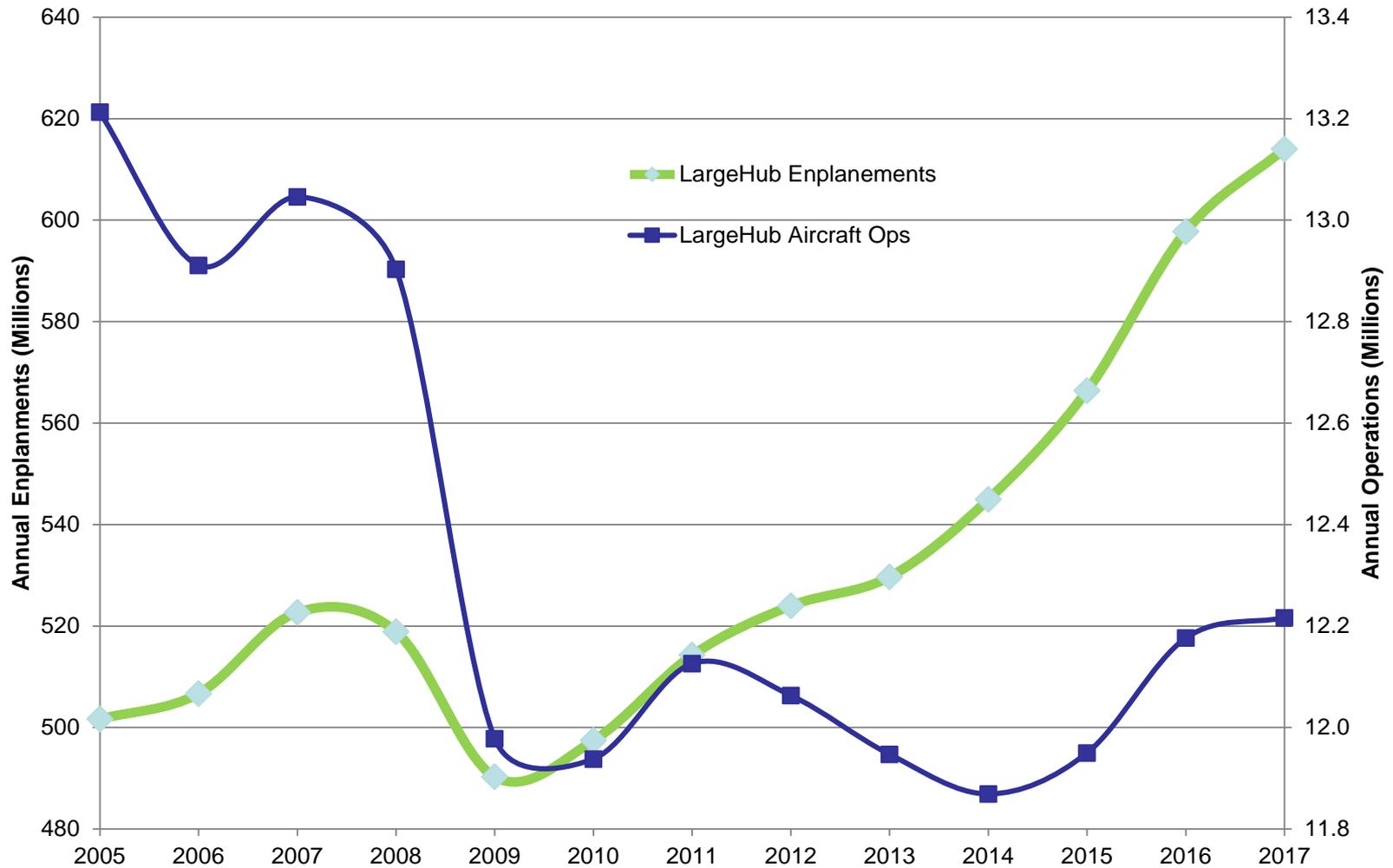
Trends: Recovery
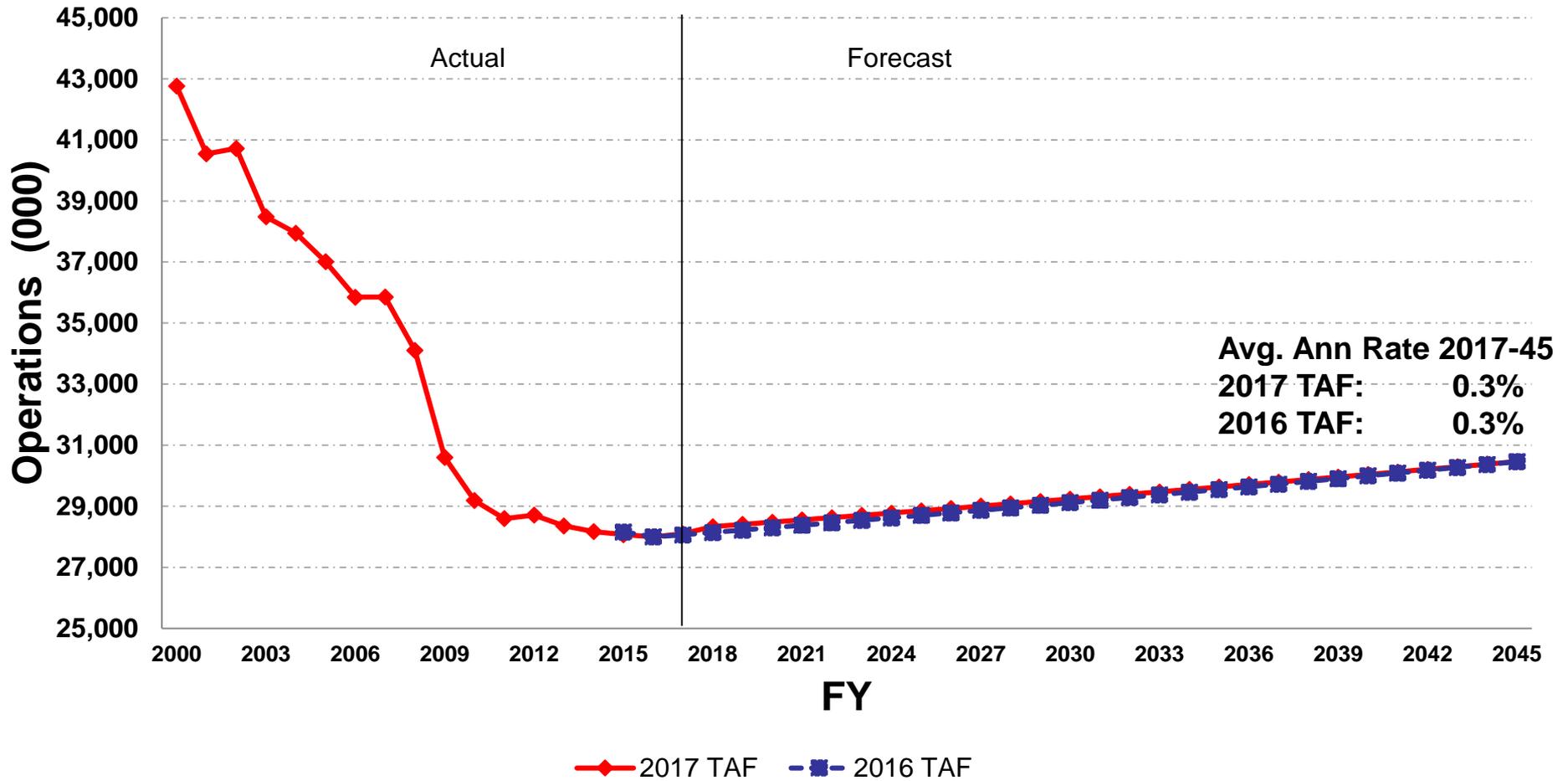## 9 Large Hubs have more operations traffic than in 2005

FY2017 vs FY2005 Operations at Large Hubs
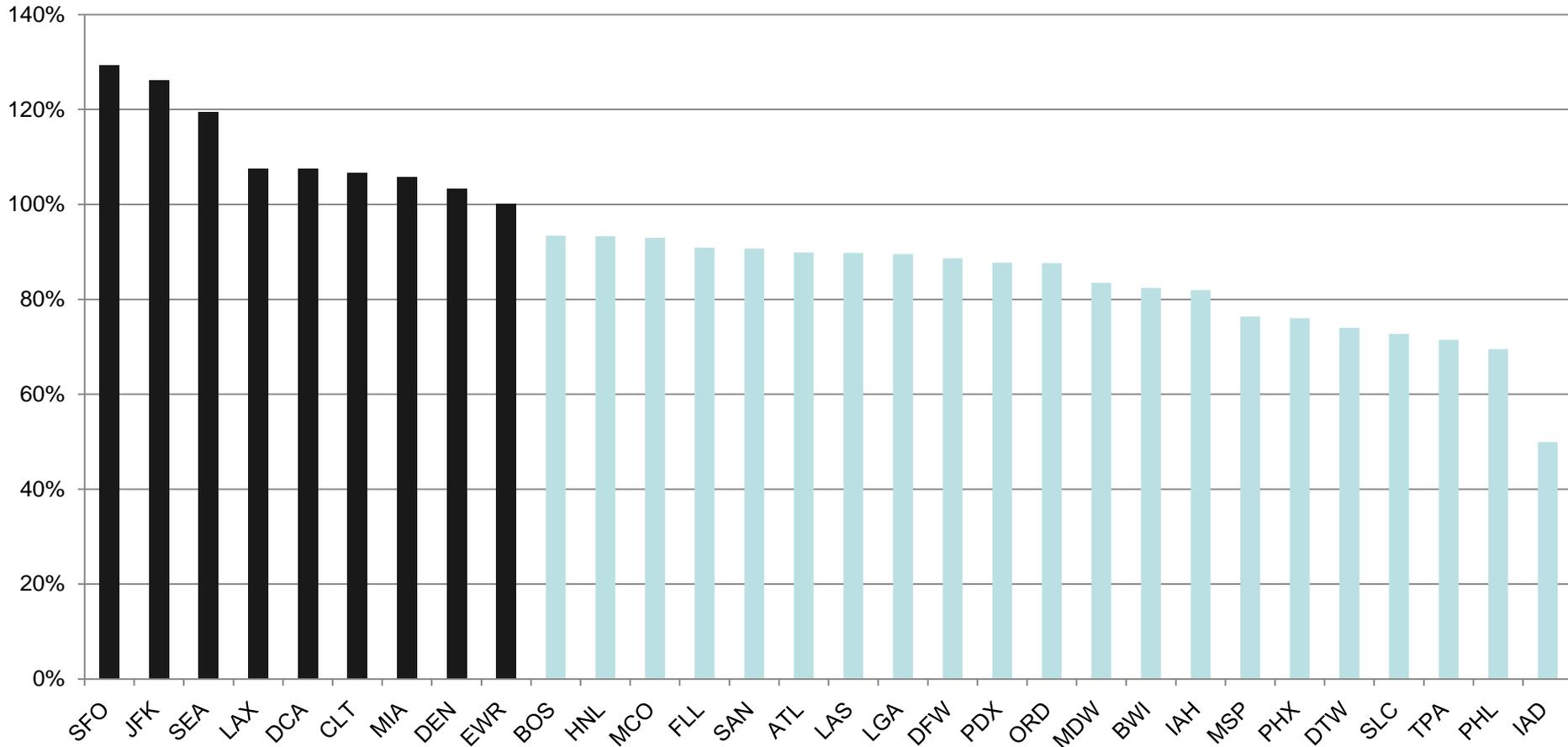
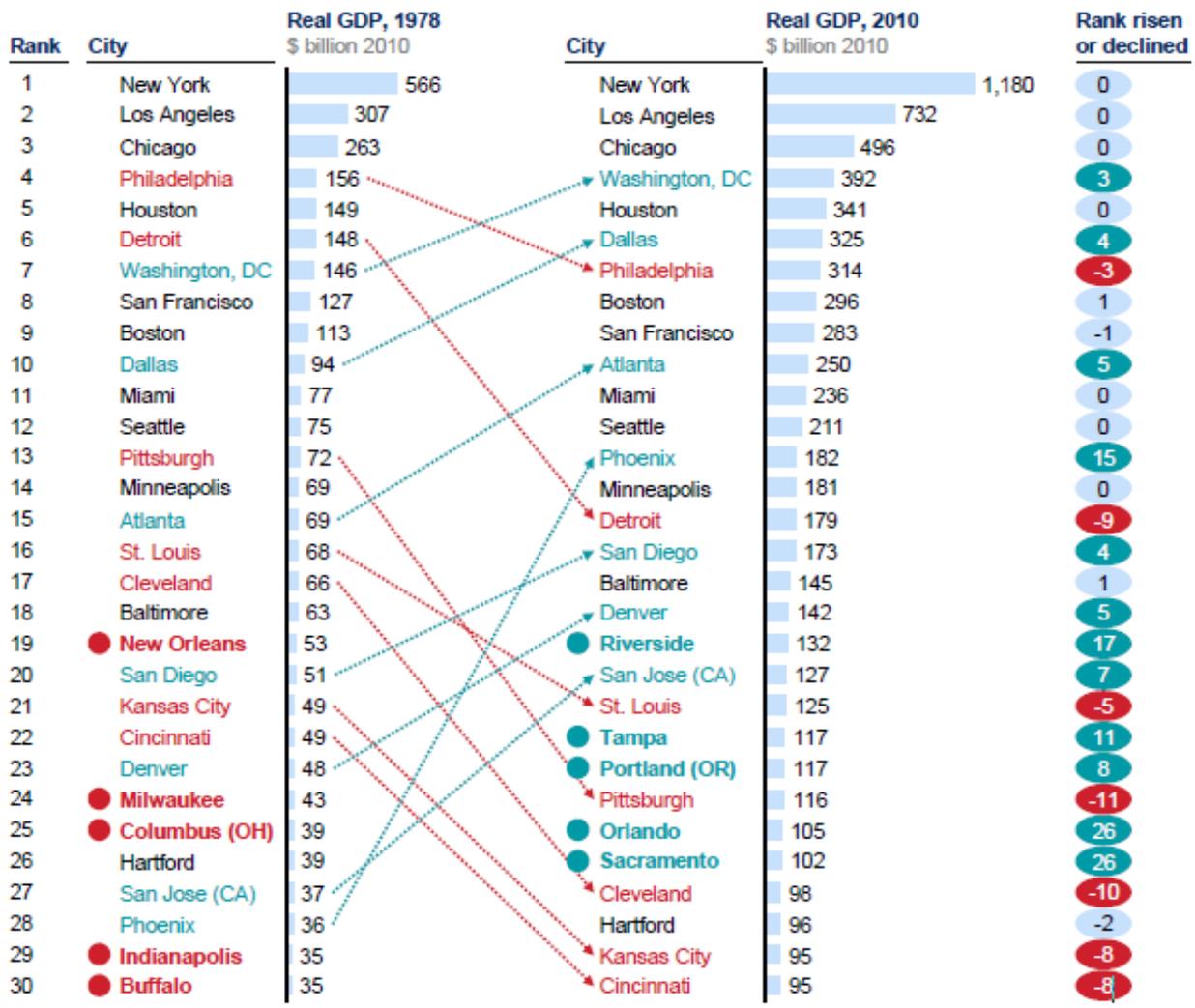# Trends: Passengers up, Operations were down but now stable and growing

Trends: GA Towered Airports

Avg. Ann Rate 2017-45
2017 TAF: 0.3%
2016 TAF: 0.3%

Legend: 2017 TAF, 2016 TAF

There have been significant shifts in the economic weight of the top US cities over a long period

Legend:
- ● Entered top 30
- ● Dropped from top 30
- ┄┄► Rose at least 3 spots
- ┄┄► Declined at least 3 spots

Rank	City	Real GDP, 1978 $ billion 2010	City	Real GDP, 2010 $ billion 2010	Rank risen or declined
1	New York	566	New York	1,180	0
2	Los Angeles	307	Los Angeles	732	0
3	Chicago	263	Chicago	496	0
4	Philadelphia	156	Washington, DC	392	3
5	Houston	149	Houston	341	0
6	Detroit	148	Dallas	325	4
7	Washington, DC	146	Philadelphia	314	-3
8	San Francisco	127	Boston	296	1
9	Boston	113	San Francisco	283	-1
10	Dallas	94	Atlanta	250	5
11	Miami	77	Miami	236	0
12	Seattle	75	Seattle	211	0
13	Pittsburgh	72	Phoenix	182	15
14	Minneapolis	69	Minneapolis	181	0
15	Atlanta	69	Detroit	179	-9
16	St. Louis	68	San Diego	173	4
17	Cleveland	66	Baltimore	145	1
18	Baltimore	63	Denver	142	5
19	● New Orleans	53	● Riverside	132	17
20	San Diego	51	San Jose (CA)	127	7
21	Kansas City	49	St. Louis	125	-5
22	Cincinnati	49	● Tampa	117	11
23	Denver	48	● Portland (OR)	117	8
24	● Milwaukee	43	Pittsburgh	116	-11
25	● Columbus (OH)	39	● Orlando	105	26
26	Hartford	39	● Sacramento	102	26
27	San Jose (CA)	37	Cleveland	98	-10
28	Phoenix	36	Hartford	96	-2
29	● Indianapolis	35	Kansas City	95	-8
30	● Buffalo	35	Cincinnati	95	-8

Source: McKinsey Global Institute, "Urban America: US Cities in the global economy," p.19, April 2012

Cities and metropolitan areas also evolve over the long-term

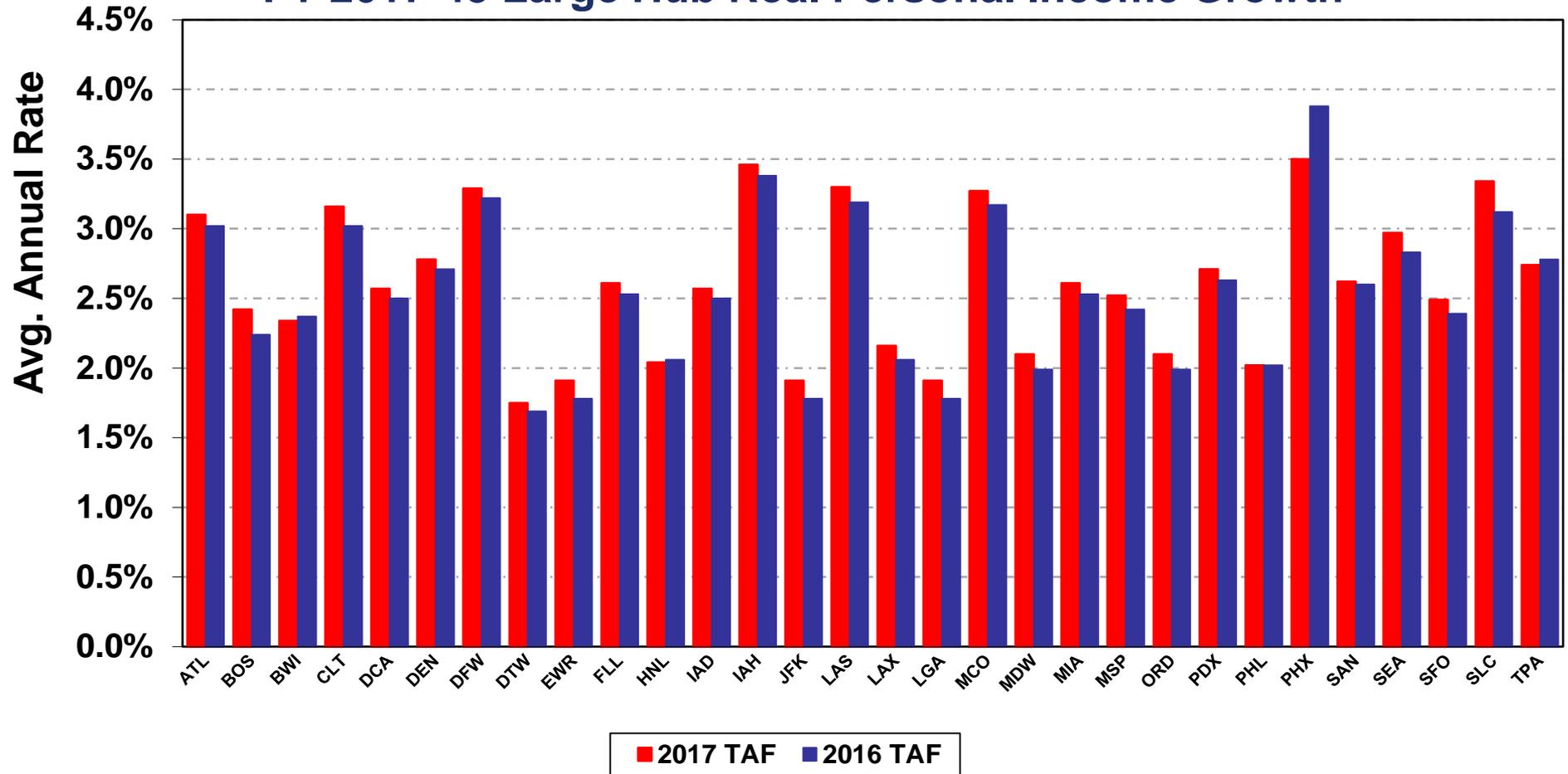**Cities / not Airports**

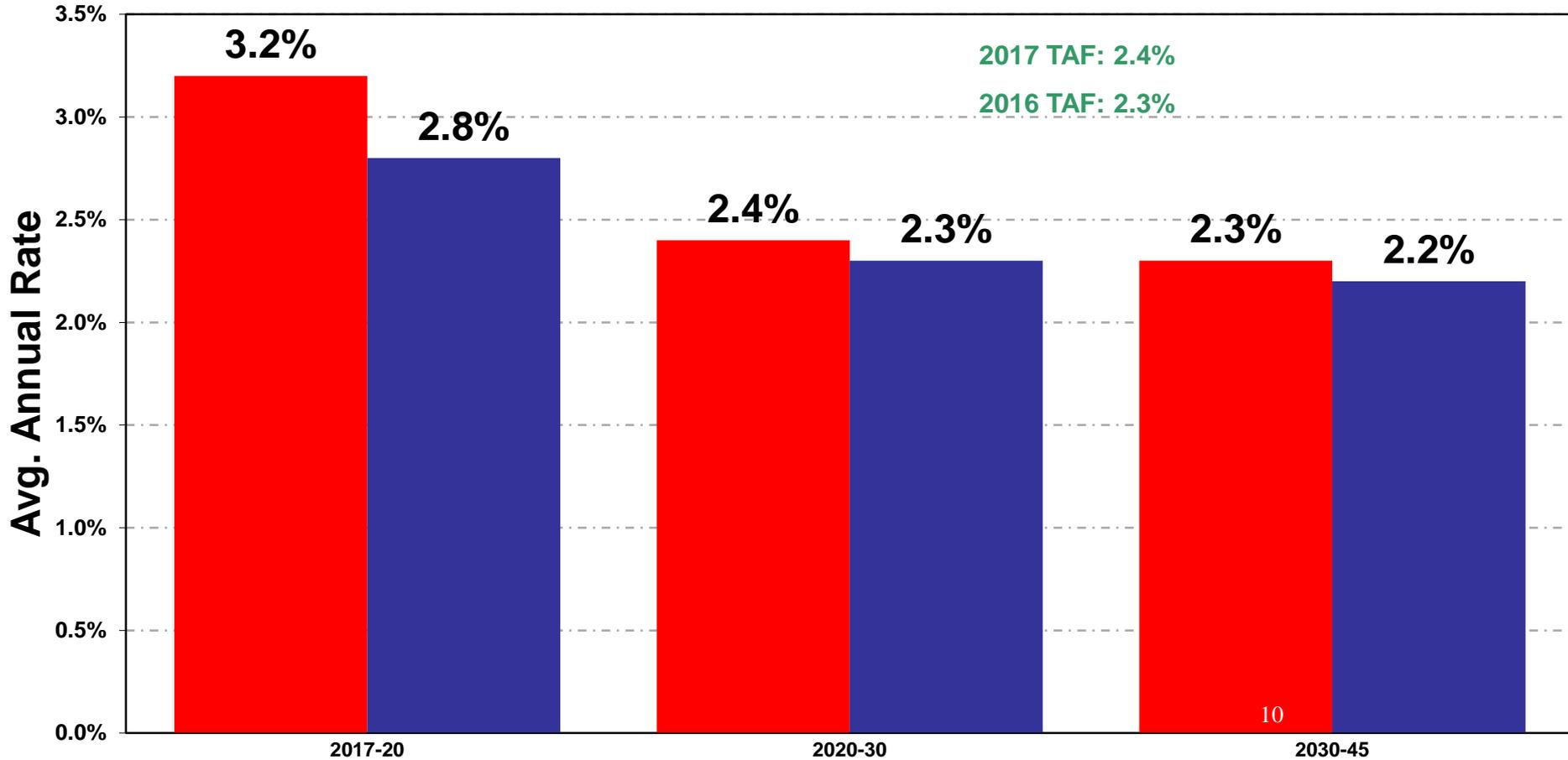# TAF: Background and Motivation

- TAF developed and published by FAA's Policy Office annually

  - Historically a top-down forecast

- Airport planning forecasts are required to be compared to TAF in the interest of consistency

- Multiple TAF models by airport type:

  - TAF-M (Modernized): interconnected model for airports with more than 100,000 enplanements

  - TAF-L (Legacy): remaining towered airports not in TAF-M
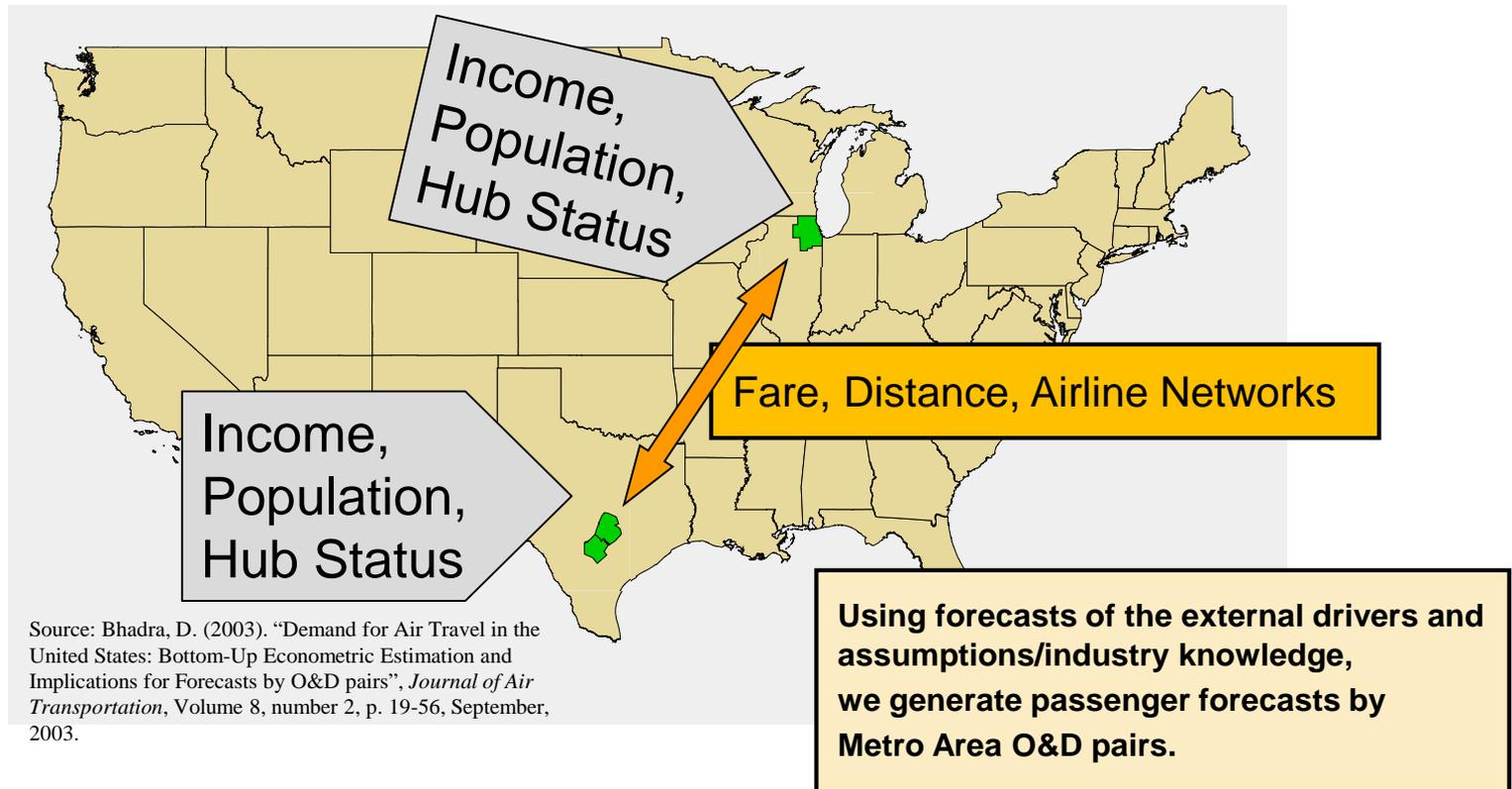
  - Non-towered GA: generally flat forecast

FY 2017-45 Large Hub Real Personal Income Growth

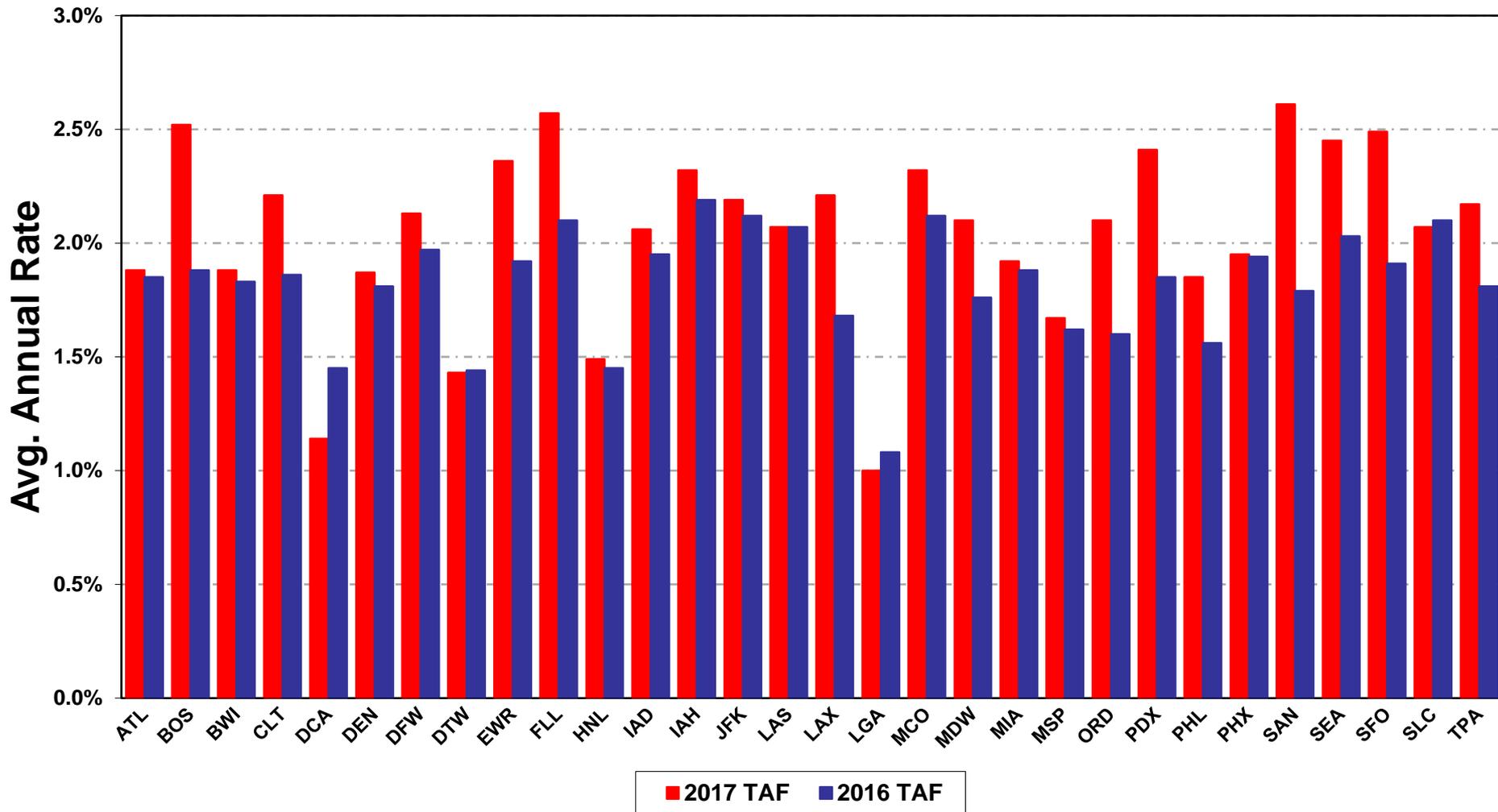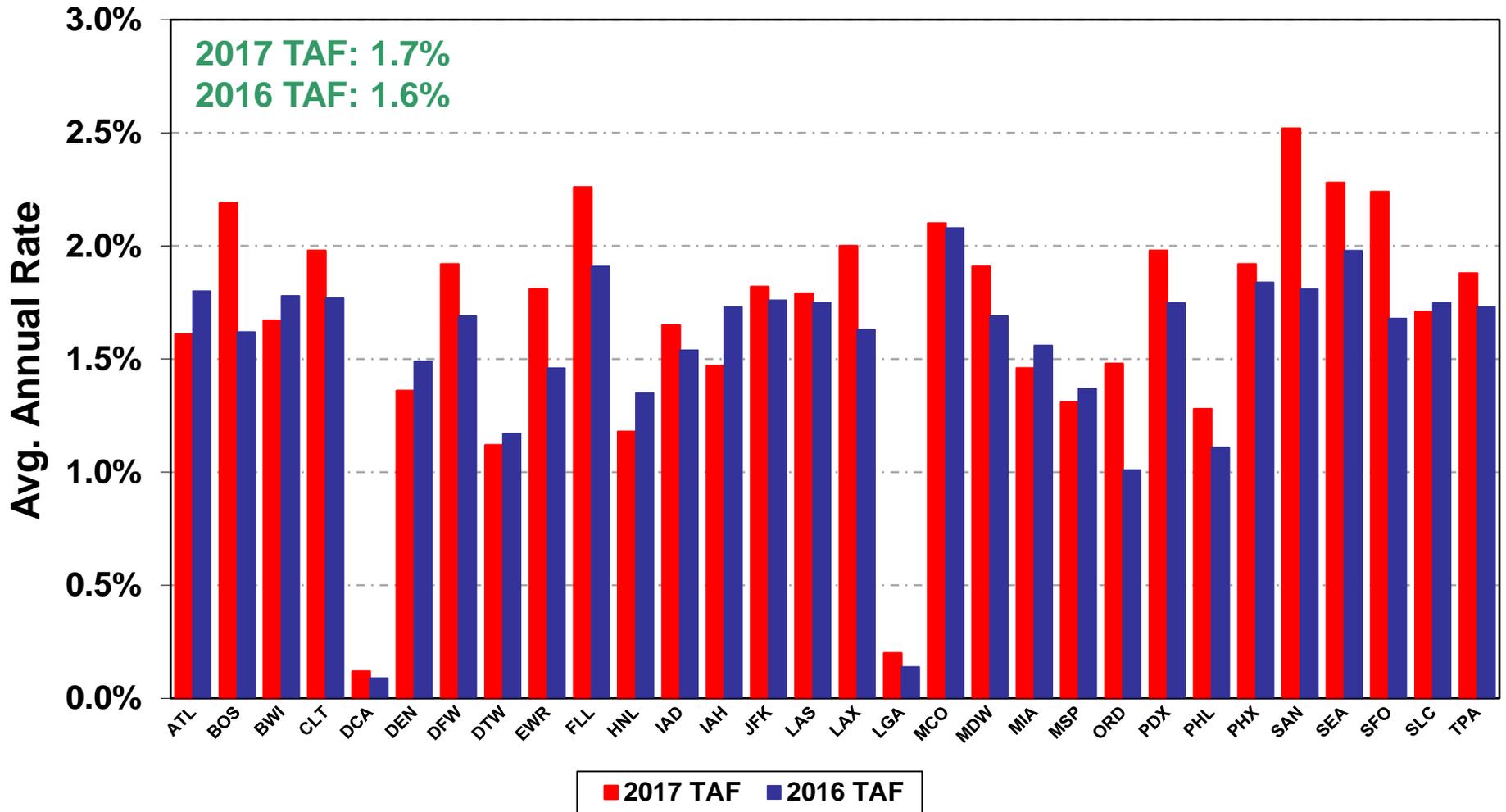# Large Hub Real Personal Income Growth: 2017-45

2017 TAF: 2.4%
2016 TAF: 2.3%

Period	Red	Blue
2017-20	3.2%	2.8%
2020-30	2.4%	2.3%
2030-45	2.3%	2.2%

Avg. Annual Rate (y-axis: 0.0% to 3.5%)

TAF-M: Flow of Passenger Traffic between Metropolitan areas

Income, Population, Hub Status

Income, Population, Hub Status

Fare, Distance, Airline Networks

Source: Bhadra, D. (2003). "Demand for Air Travel in the United States: Bottom-Up Econometric Estimation and Implications for Forecasts by O&D pairs", *Journal of Air Transportation*, Volume 8, number 2, p. 19-56, September, 2003.

Using forecasts of the external drivers and assumptions/industry knowledge, we generate passenger forecasts by Metro Area O&D pairs.

FY 2017-45 Large Hub Passenger Growth

FY 2017-45 Large Hub Commercial Ops Growth

2017 TAF: 1.7%
2016 TAF: 1.6%

Legend: 2017 TAF (red), 2016 TAF (blue)

TAF: 2016 GAO Audit

Aviation activity metric	Mean percentage error		
	1-Year forecast	5-Year forecast	10-Year forecast
Passenger enplanements	-0.2%	14.7%	31.3%
Revenue passenger miles	-0.6%	14.0%	26.9%
Total operations	1.9%	25.5%	54.7%
Available seat miles	0.1%	18.6%	40.5%

FAA analysis shows the primary reason for forecast error is the underlying economic forecast
(e.g., if economic growth is lower than forecast)
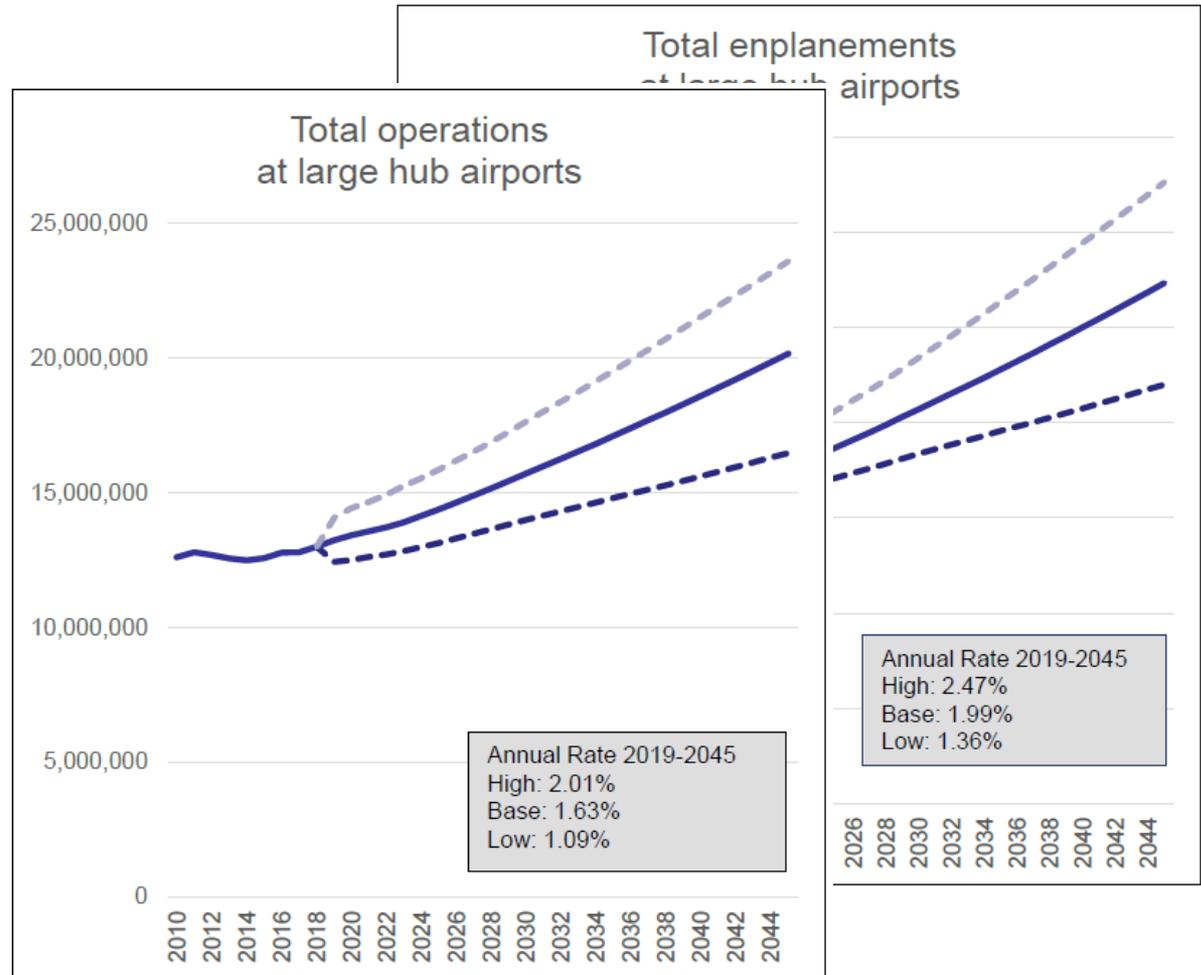
TAF Uncertainty Ranges
Developed for Large and Medium Hub Airports

Optimistic scenario:
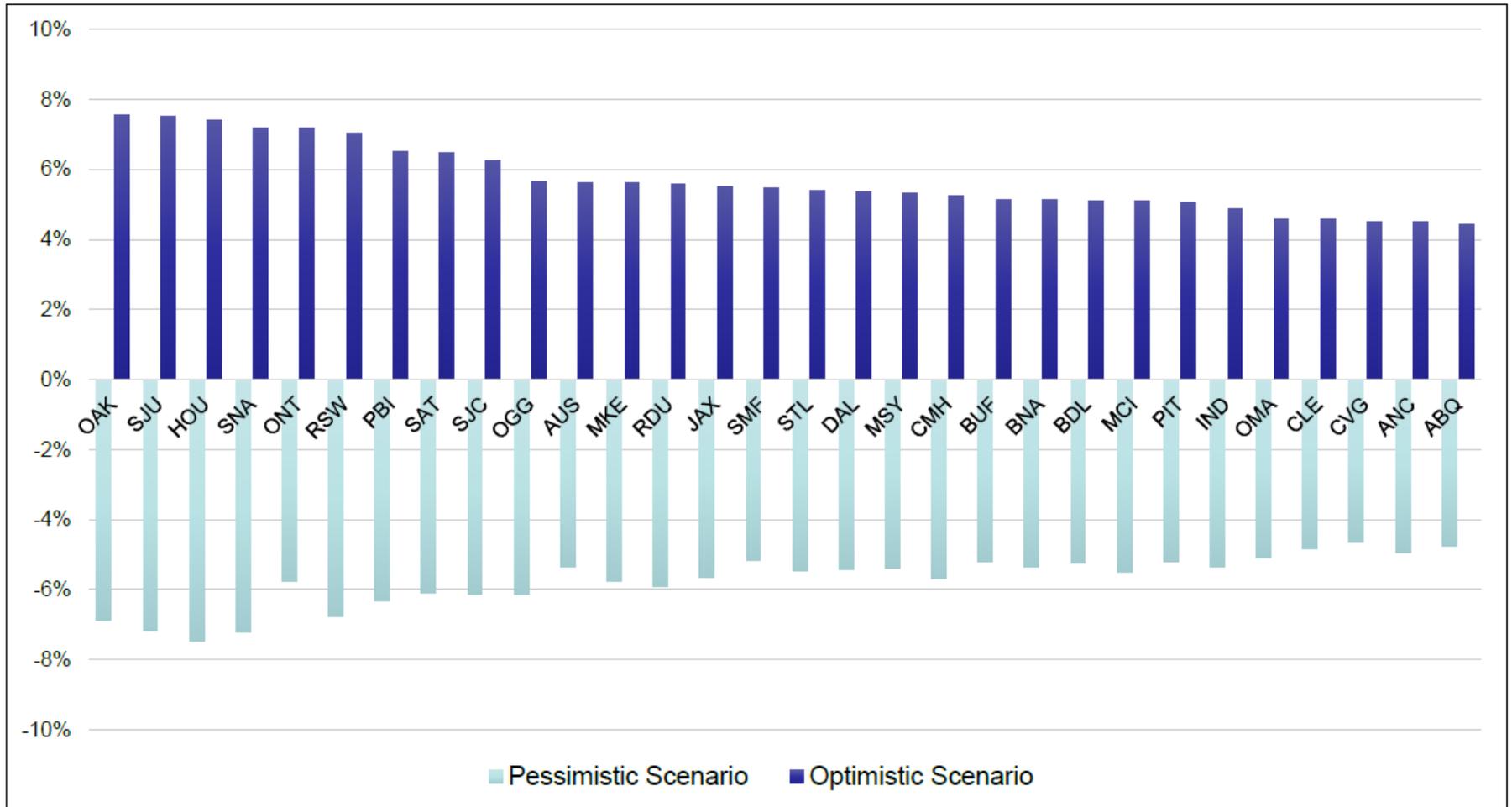
- High Personal Income

- Low oil prices and fares

Pessimistic scenario:

- Low Personal Income

- High oil prices and fares

Total enplanements at large hub airports

Total operations at large hub airports

25,000,000

20,000,000

15,000,000

10,000,000

5,000,000

0

2010 2012 2014 2016 2018 2020 2022 2024 2026 2028 2030 2032 2034 2036 2038 2040 2042 2044

Annual Rate 2019-2045
High: 2.01%
Base: 1.63%
Low: 1.09%

Annual Rate 2019-2045
High: 2.47%
Base: 1.99%
Low: 1.36%

2026 2028 2030 2032 2034 2036 2038 2040 2042 2044

TAF Uncertainty:
Enplanements Variance at Medium Hubs (+10-years)

Federal Aviation Administration

AC 150/5000-17 Critical Aircraft

Critical Aircraft

The most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport

Regular use is 500 annual operations

An operation is either a takeoff or landing

Excluding touch and go operations

Similar Characteristics

Refers to the practice of grouping aircraft by comparable operational and/or physical characteristics
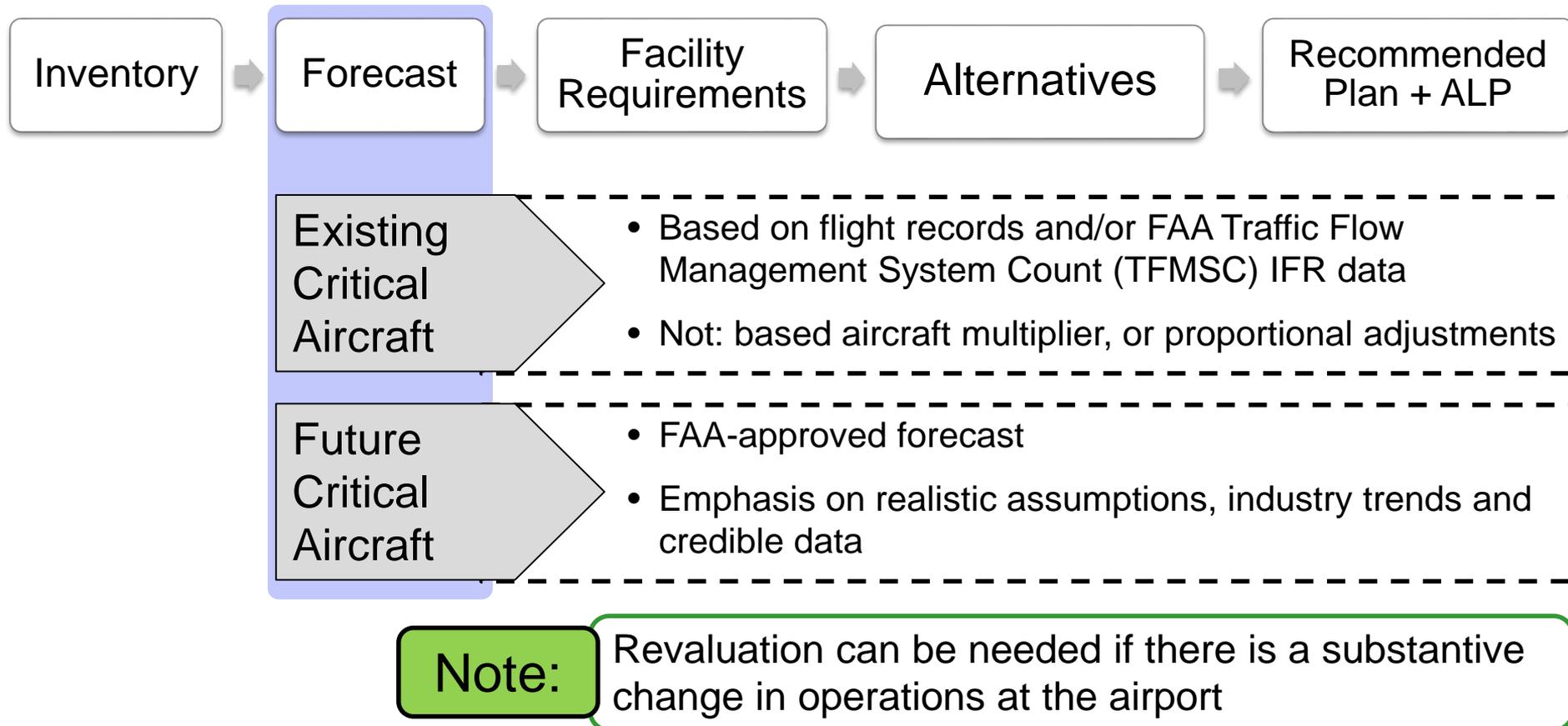
What's New?

- **Common, streamlined definition**
- **Requires FAA determination of <u>existing</u> and <u>future</u> critical aircraft**
- **"Regular use" instead of "substantial use"**
  - Regular use is more representative of what this definition is trying to capture; i.e., planning and development for recurring and future activity at the airport
- **Both itinerant and local operations count towards regular use**
  - Excludes touch-and-go operations
  - Airport planning and design requires considering the specific safety and operational needs of all the aircraft which use the airfield
  - Scheduled commercial service needs to meet regular use, as well

Critical Aircraft Determination typically made during planning process

Inventory → Forecast → Facility Requirements → Alternatives → Recommended Plan + ALP

Existing Critical Aircraft
- Based on flight records and/or FAA Traffic Flow Management System Count (TFMSC) IFR data
- Not: based aircraft multiplier, or proportional adjustments

Future Critical Aircraft
- FAA-approved forecast
- Emphasis on realistic assumptions, industry trends and credible data

Note: Revaluation can be needed if there is a substantive change in operations at the airport

Non-towered Operations Counts

- **Pegasas Project 29:** Technology Assessment to Improve Operations Counts at Non-Towered Airports.

- The goal of FAA is to develop a cost-effective technology to conduct airport operation counts with a 95% count accuracy.

- Testing at multiple towered and non-towered airports this year.

- Timeframe ~2019 for completion