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Let's talk about the weather...

John P. Heimlich
Vice President & Chief Economist
ACH Revenue Accounting Committee Meeting
April 24, 2019

The ~730,000 Employees of U.S. Passenger and Cargo Airlines Offer an Extensive Worldwide Network Facilitating the Safe and Rapid Movement of People and Goods

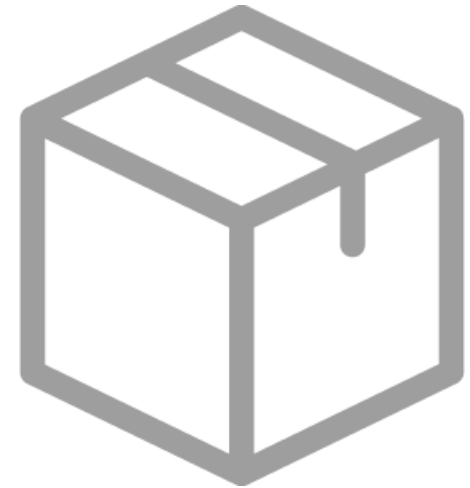
27,000 daily **flights**
across the globe*



2.4 million **passengers**
per day



58,000 tons of **cargo**
per day*



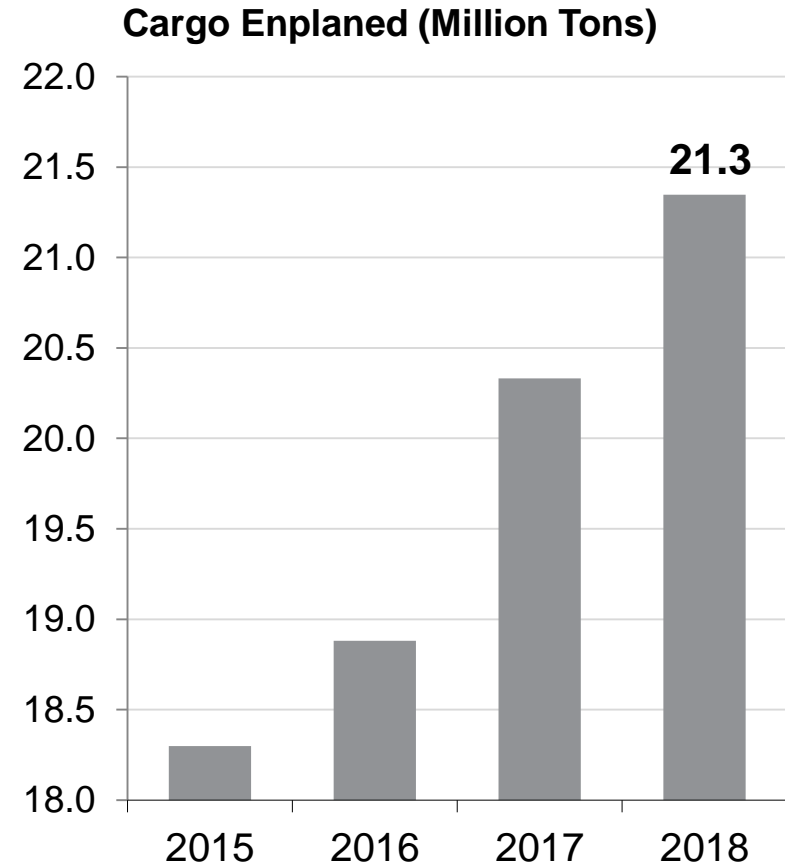
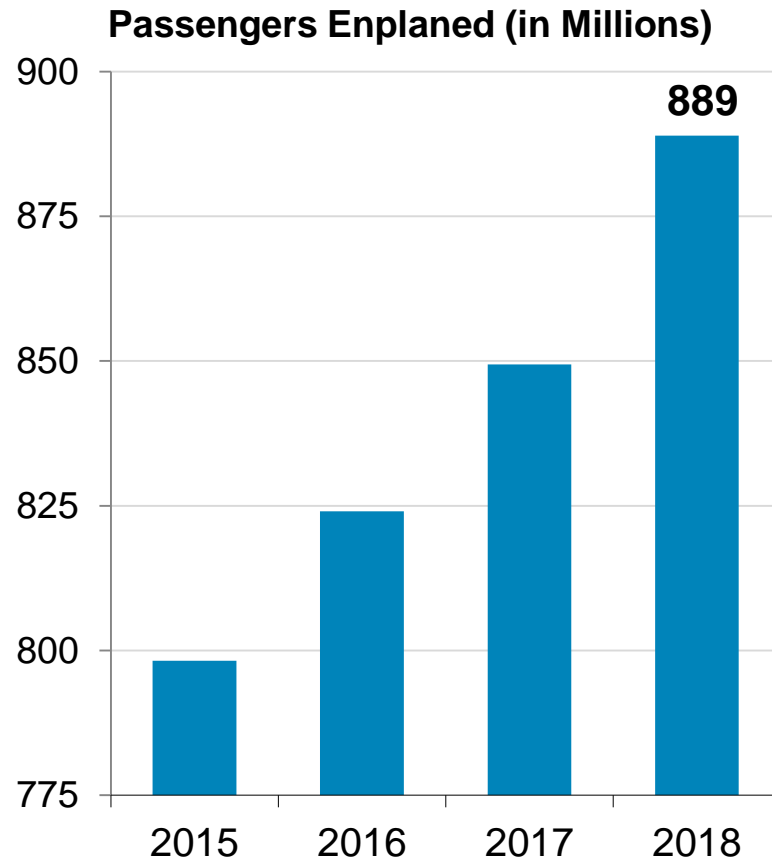
Source: A4A and Bureau of Transportation Statistics for U.S. passenger and cargo airlines

* Includes passenger/combination and cargo-only carriers



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U.S. Airline Passenger and Cargo Volumes Reached All-Time Highs in 2018



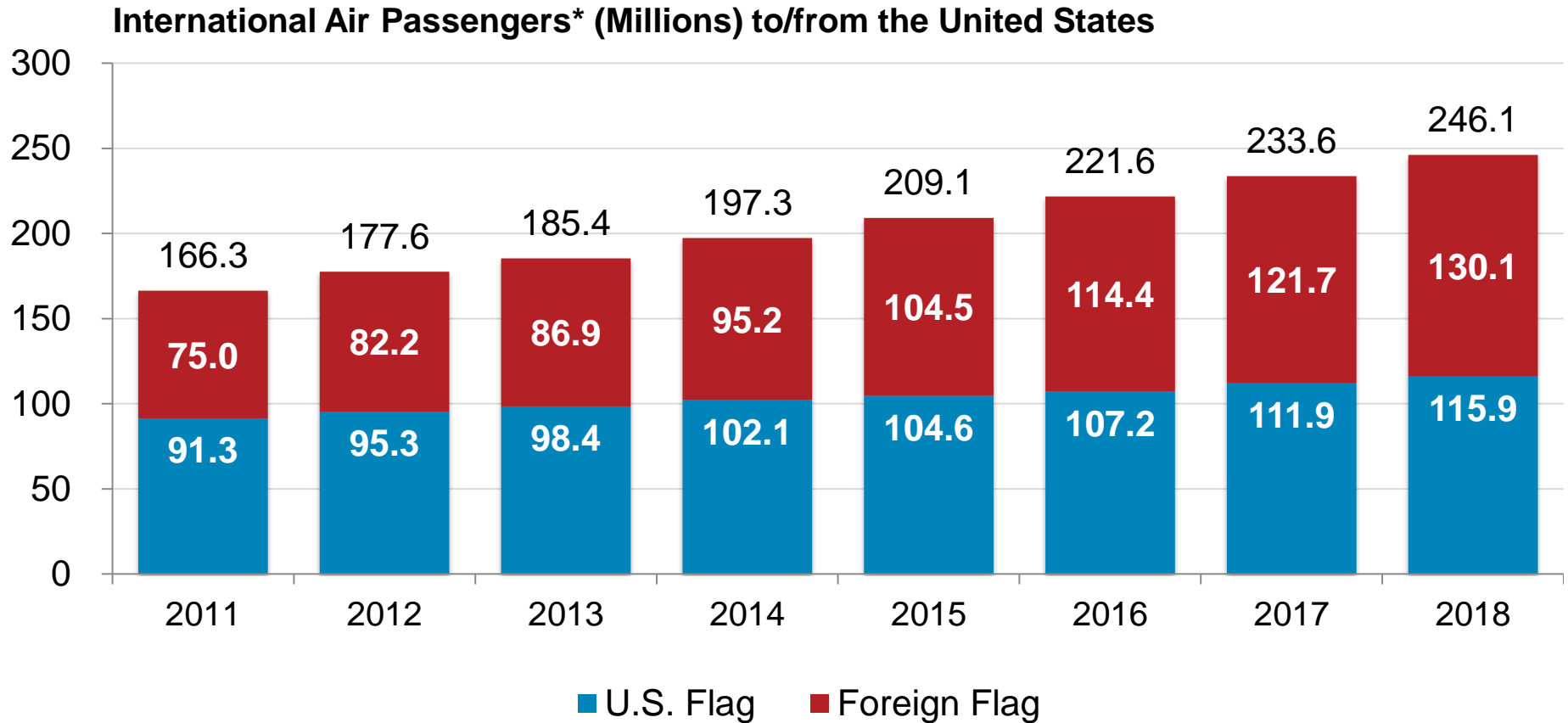
Source: Bureau of Transportation Statistics – T1 for scheduled service-passengers and T100 for all services (scheduled and nonscheduled) cargo (freight and mail)



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Air Travel Between the U.S. and Foreign Countries* Reached All-Time High in 2018

Foreign Flag Airlines Carried 53 Percent of Passengers, Up From 45 Percent in 2011



Source: U.S. Department of Commerce National Travel and Tourism Office

*Years preceding 2011 do not include traffic between the United States and Canada

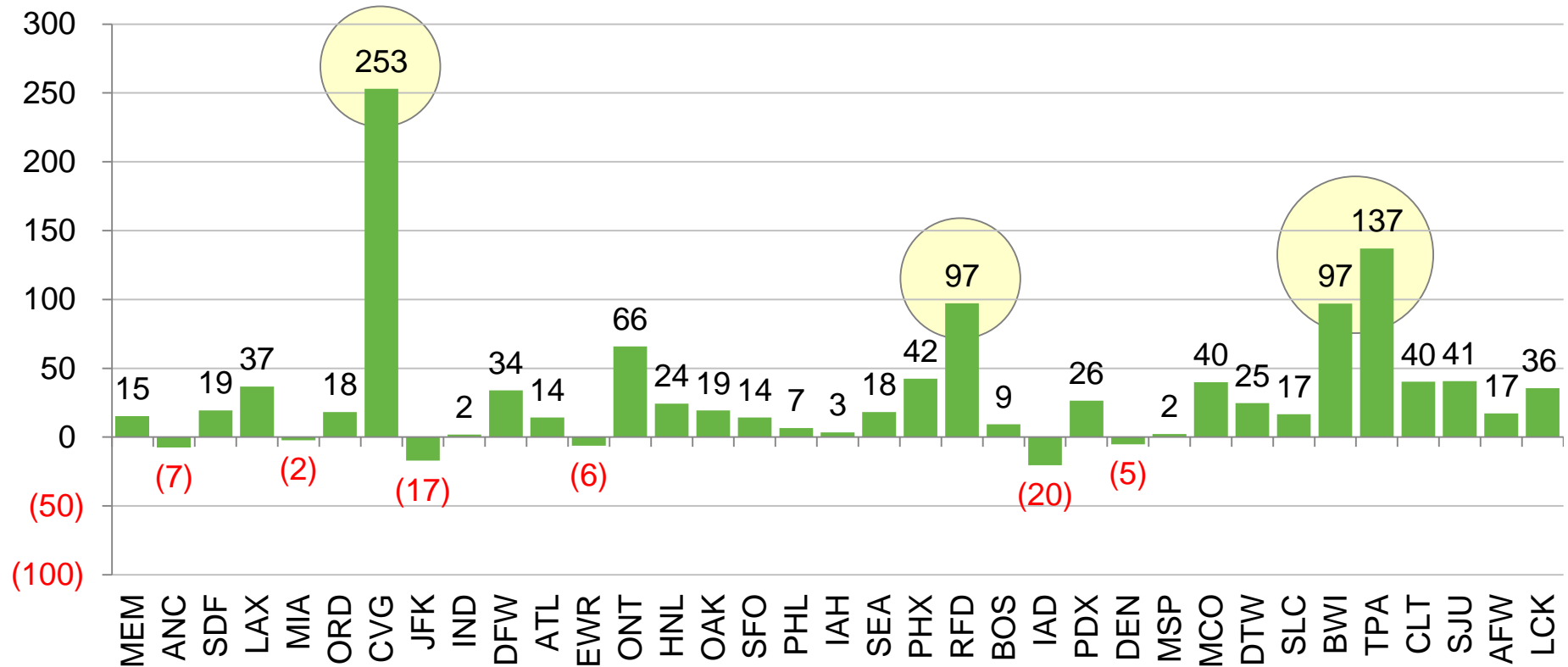


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E-Commerce and Rapid Fulfillment Redrawing the Map for Distribution of Air Cargo

Cincinnati (CVG) and Tampa (TPA) Are Among the Biggest Winners

% Change in Outbound Cargo Payload at Largest U.S. Cargo Airports, 2010-2018*



Source: DOT T100 segment data

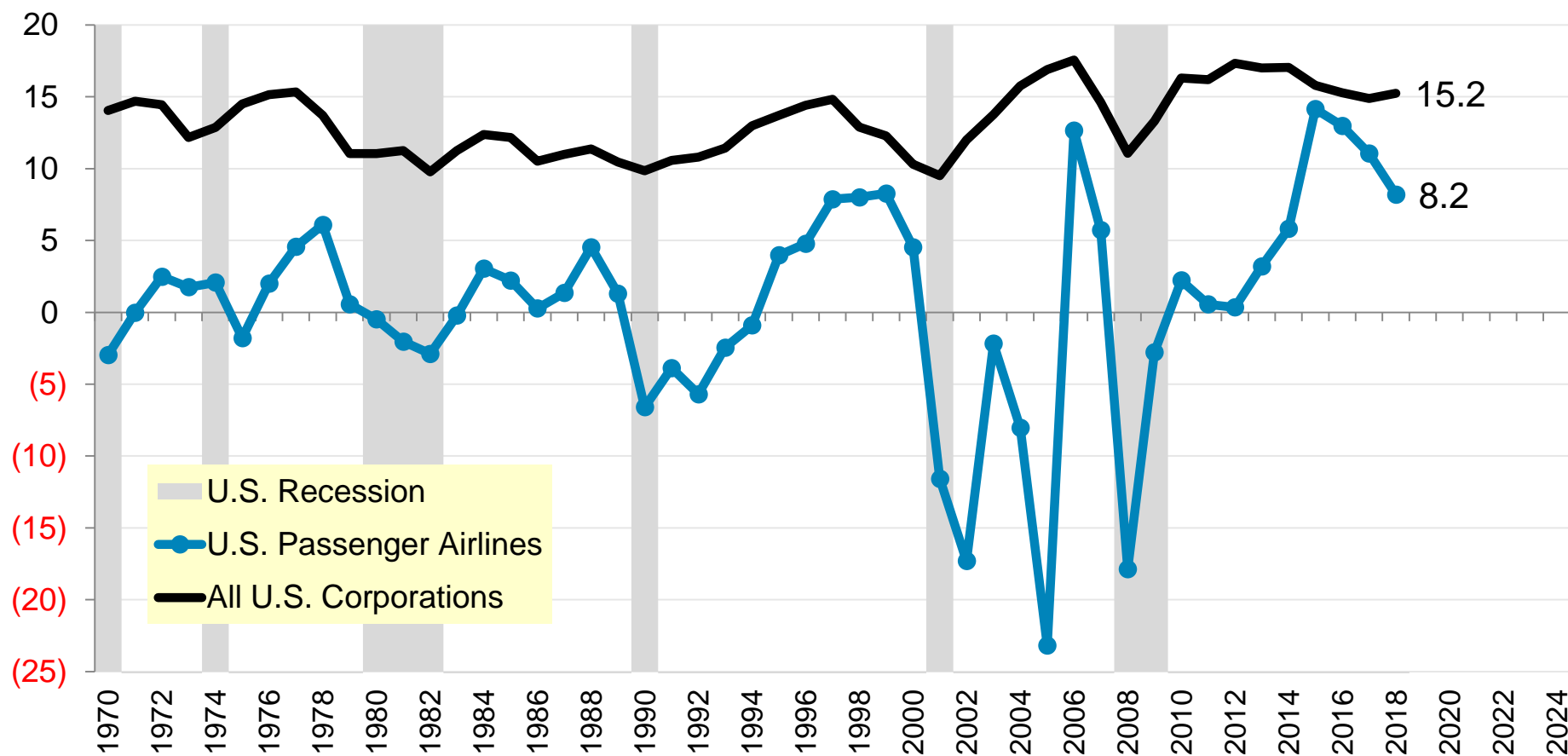
* 12 months ended September 2018



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Even in Best Years, Profitability of U.S. Airlines Lags U.S. Corporate Average

Pre-Tax Profit Margin (%) *Gap Widened in 2016 and 2017, Widening Further in 2018*



Source: ATA Annual Reports (1970-1976), A4A Passenger Airline Cost Index (1977-present); Bureau of Economic Analysis

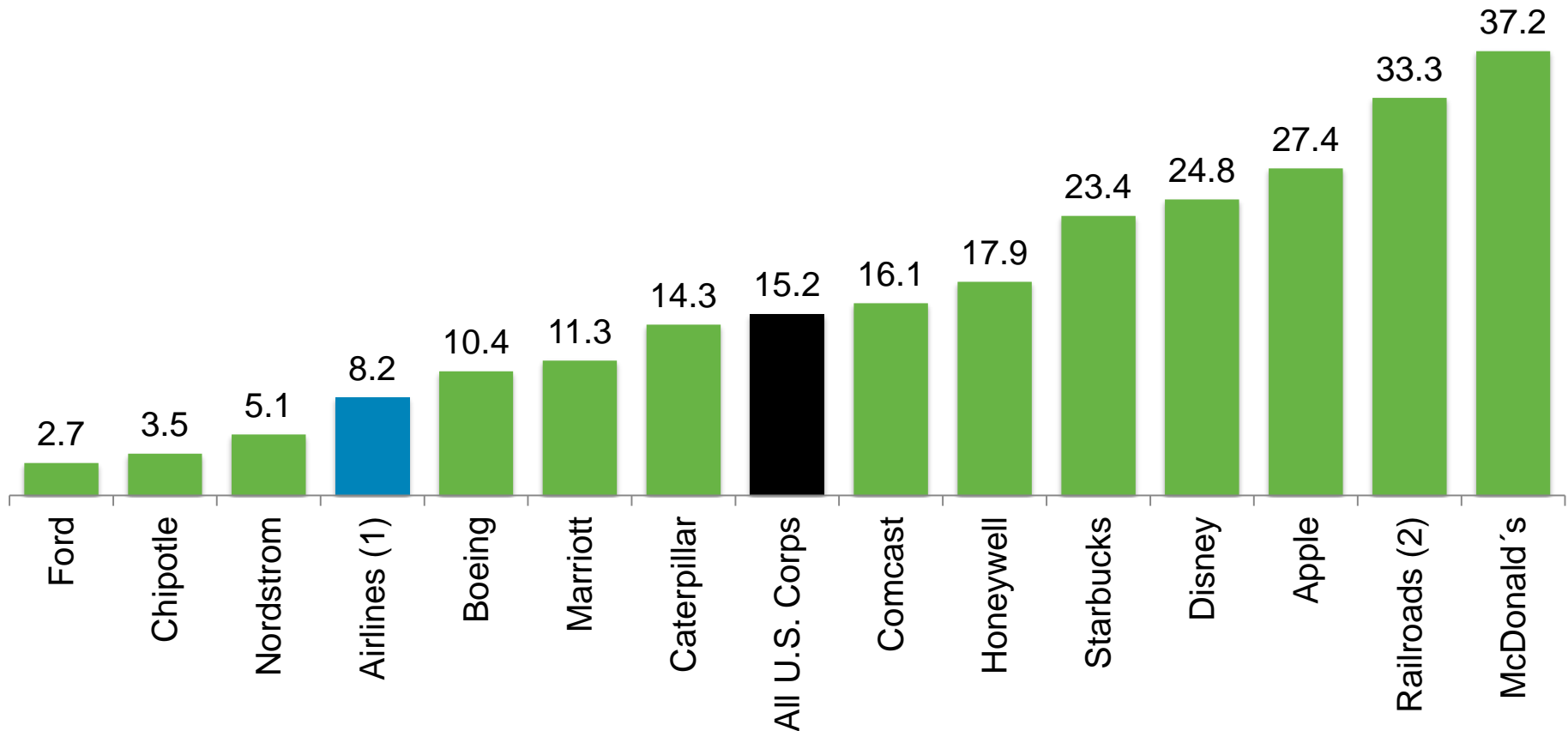
Note: Recessions highlighted in gray



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In 2018, U.S. Airline* Profitability Was a Little Over Half the U.S. Average

Pre-Tax Profit Margin (% of Operating Revenues)



¹ Alaska, Allegiant, American, Delta, Hawaiian, JetBlue, Southwest, Spirit and United

² CSX, Norfolk Southern and Union Pacific

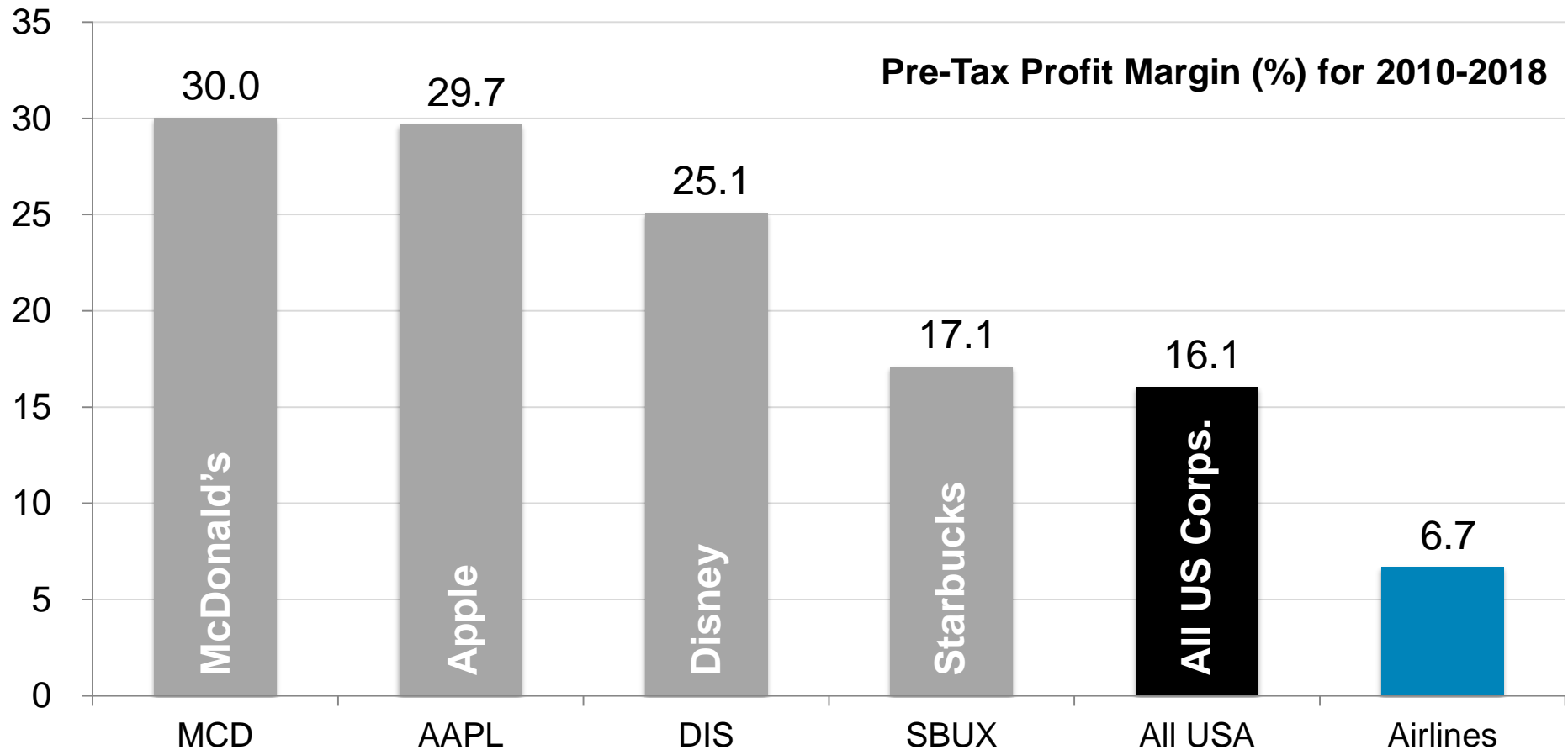
Source: Company SEC filings



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Airlines Continue to Strive for Solid Profitability Across the Business Cycle

In Current U.S. Business Cycle, Airline Margins Are Less Than Half the U.S. Average



Sources: U.S. Bureau of Economic Analysis, A4A Passenger Airline Cost Index and company SEC filings



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2018 Posed Some Significant Operating Challenges

Power Outages/Airport Equipment:

Jan 1 CBP nationwide outage; Jan 7 (JFK T4 water main break)

Aug 16 – DCA loses power for more than 1 hour, affecting about two dozen flights

Sep 16 – PHX T4 multi-hour closure due to suspicious abandoned rental car

Oct 9 – law enforcement asked Frontier 1612 passengers to exit plane to handle “emotional support squirrel”

Airport Construction: ATL/CHI/DCA/DFW/HNL/HOU/LAX/MCO/MIA/NYC/PHL/PHX/SAN/TPA

Major Weather

- Jan 3-5 (“bomb cyclone”), 7-8, 12, 16-18, 21-22
- Feb 4-5, 7, 9, 11, 15, 20
- Mar 2 (Winter Storm Riley) 7 (Quinn) 13 (Skylar) 20-22 (Toby)
- Apr 4 (Mid-Atlantic/Northeast), 14-16 (MSP/ORD/CLT/NE), 25 (NE)
- May 3 (CHI/DAL t-storms), 14-16 (CHI/mid-Atlantic/NE t-storms), 31 (SE/mid-Atlantic t-storms)
- Jun 18-20 (rainstorms and low visibility in Chicago/mid-Atlantic), 26 (CHI t-storms)
- Jul 1 (CHI storms), 15 (NYC/PHL storms), 17 (NE/mid-Atlantic), 22 (MCO), 23 (DEN), 27 (NE/mid-Atlantic)
- Aug 2-3, 7-8 (t-storms in mid-Atlantic/NE/CHI), 11 (NYC/PHL), 13-14 (mid-Atlantic/NE/DAL), 17 (NE)
- Sep 3 – flooding caused massive delays at ORD; 11-17 – Hurricane Florence (Carolinas)
- Oct 10 – Hurricane Michael battered Florida panhandle, forcing the cancellation of several hundred flights
- Nov 15-16 – snow/ice affected airports from Mid-Atlantic to NE; 25-26 snowstorm hit Chicago and Plains
- Dec 9-10 – winter storm hit North Carolina; 26-28 thunderstorms hit Dallas and Houston

Air Traffic Control: Understaffing at many major facilities; critically low staffing at New York TRACON*

* Staffing is routinely cited as the basis for many traffic management initiatives (ground delay programs, ground stops, airspace flow programs, miles-in-trail) across the NAS
Source: A4A research, FAA Air Traffic Organization and masFlight (subsidiary of Global Eagle)



In 2018, Airlines Operating in U.S. Airspace Confronted Abundance of Severe Weather

2018 Weather Was 18 Percent Worse Than 2017 and 31 Percent Worse Than 2016

Severe Weather Hours* at FAA Core 30 Airports



Source: FAA Air Traffic Organization

* Thunderstorms plus instrument meteorological conditions (IMC) within 50 nautical miles; does not include severe cold

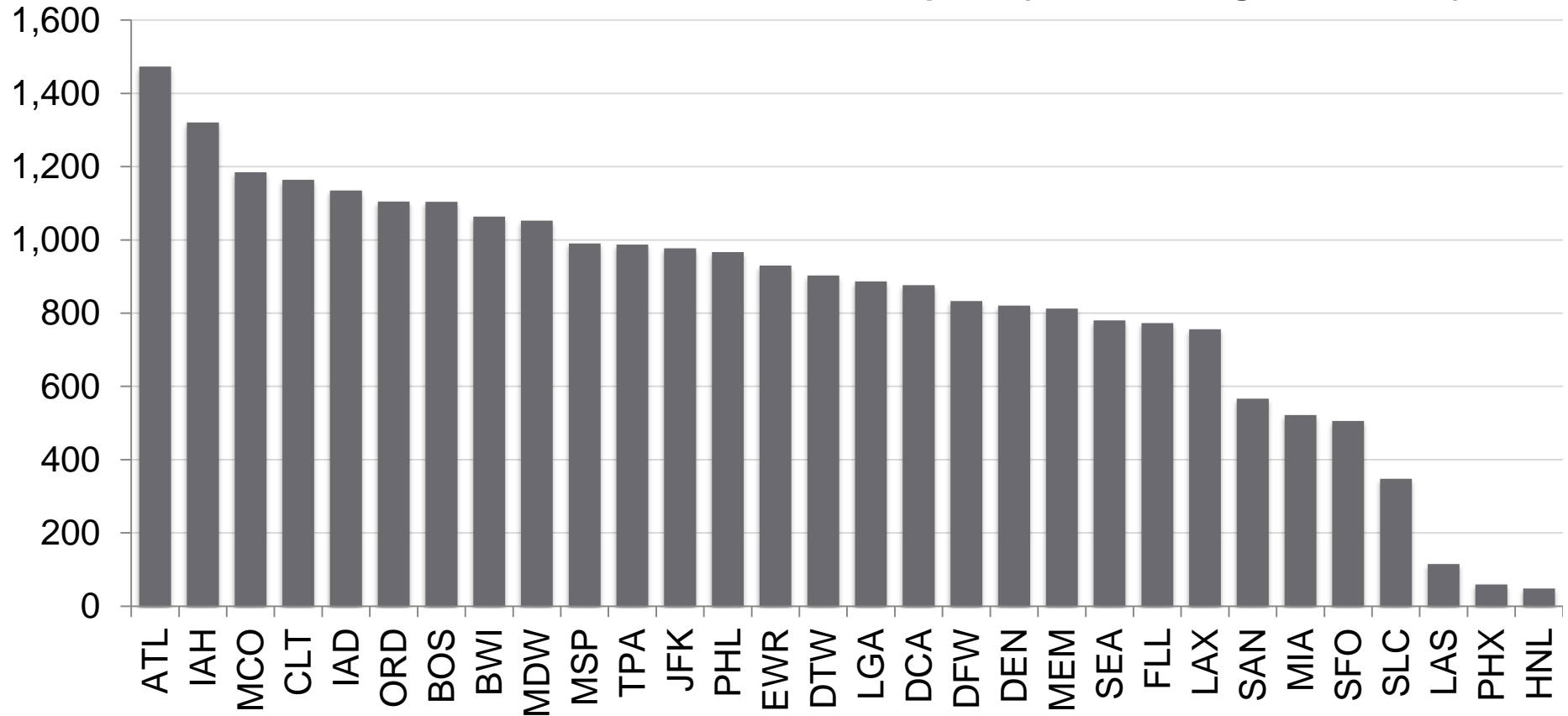


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Southeast U.S. Airports Tend to Experience the Most Severe Weather Hours*

Locations in Dry or Tropical Climates Experience the Fewest

Annual Severe Weather Hours* at FAA Core 30 Airports (5-Year Average, 2014-2018)



Source: FAA Air Traffic Organization

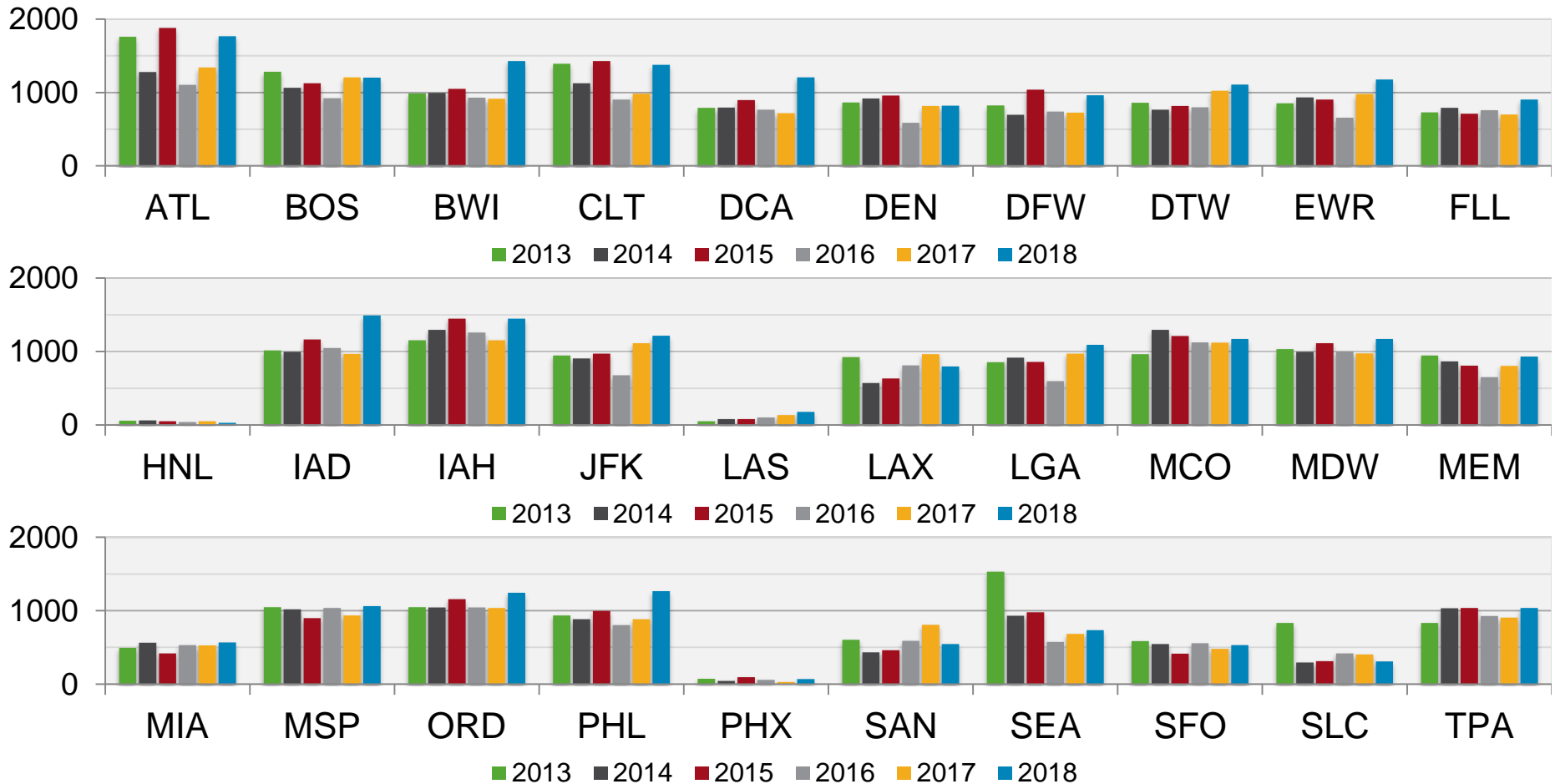
* Thunderstorms plus instrument meteorological conditions (IMC) within 50 nautical miles; does not include severe cold



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From 2013-2018, Several East Coast Hubs Saw Significantly Worse Weather

Severe Weather Hours* at FAA Core 30 Airports



Source: FAA Air Traffic Organization

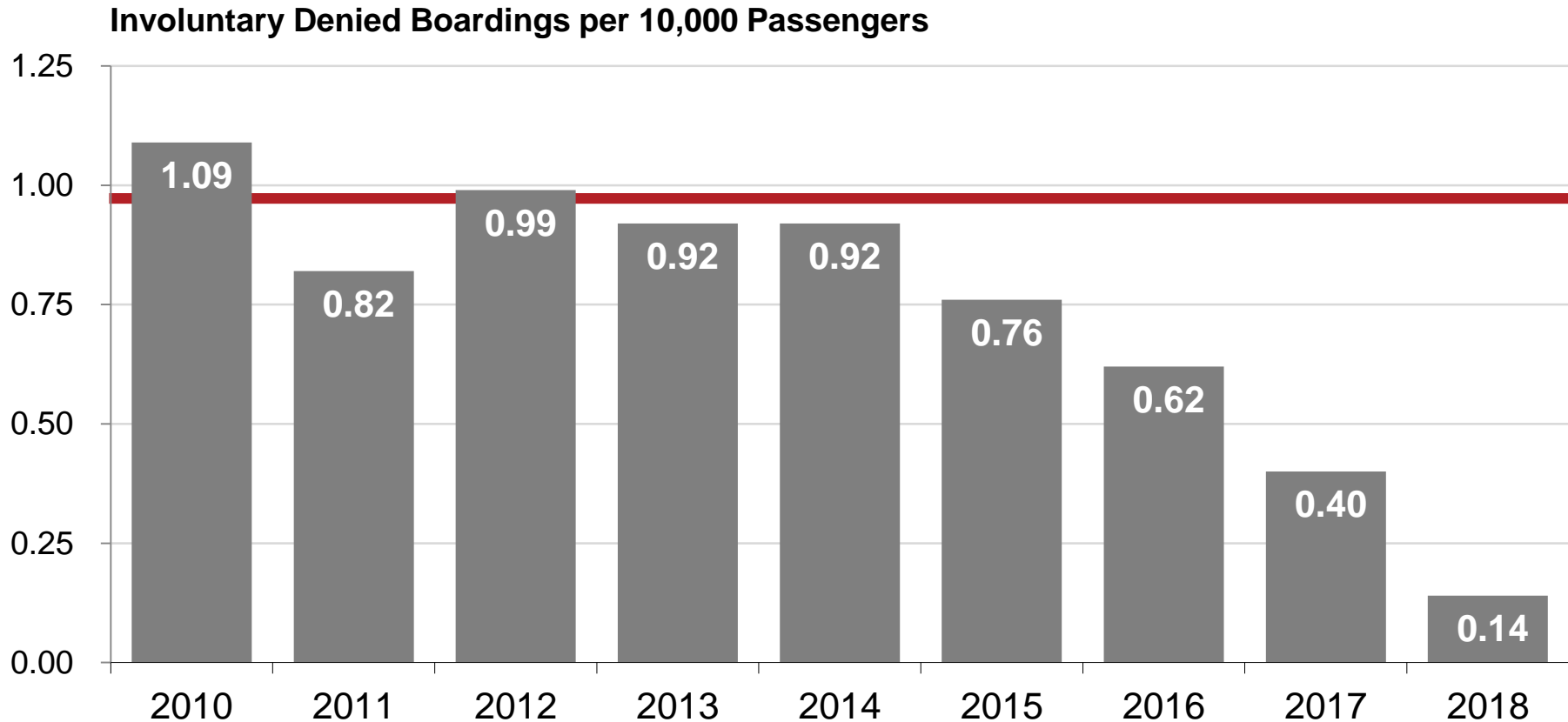
* Thunderstorms plus instrument meteorological conditions (IMC) within 50 nautical miles; does not include severe cold



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U.S. Airlines Continue to Reduce the Rate of Involuntary Denied Boardings

2018 = Best-Ever Recorded by DOT



Sources: DOT *Air Travel Consumer Report* (<http://www.dot.gov/airconsumer/air-travel-consumer-reports>)

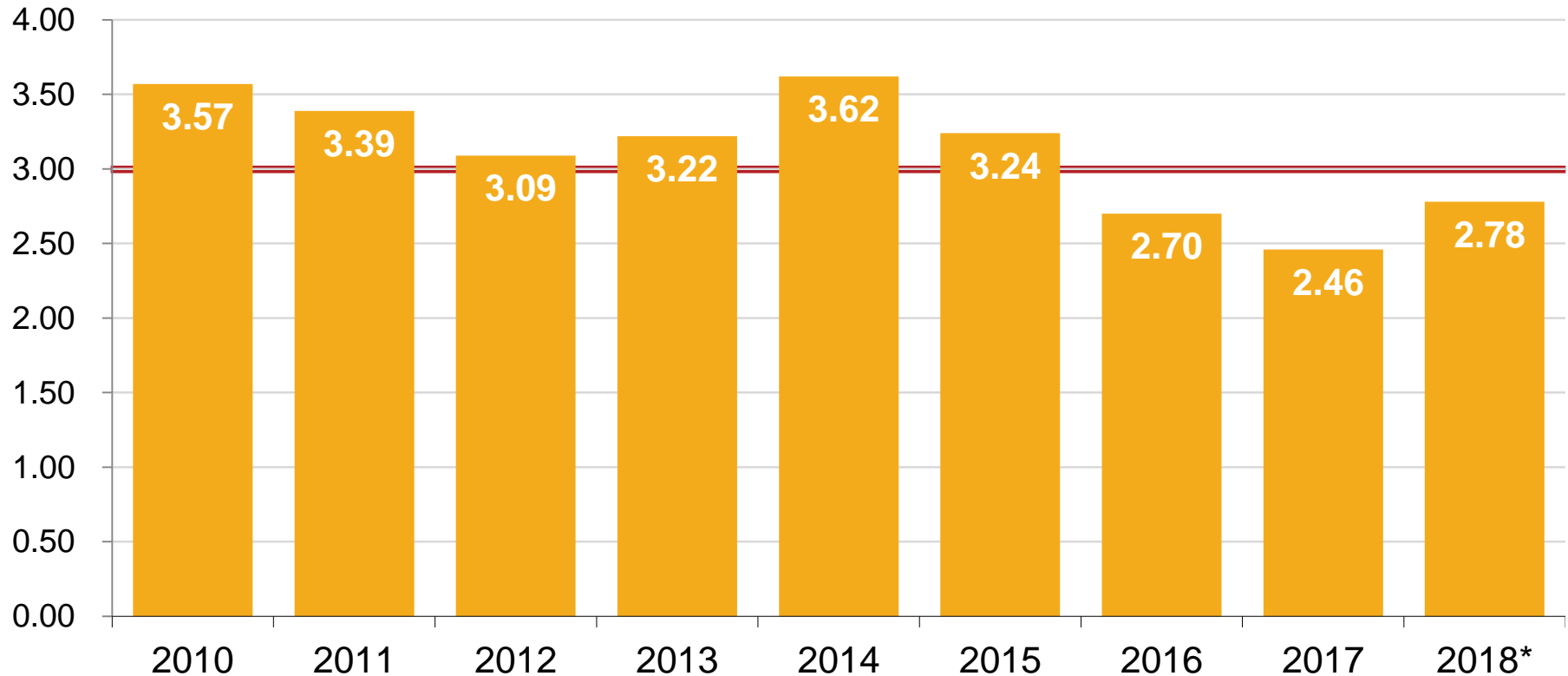


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Baggage-Handling Much Improved Over Past Few Years

Rate of Mishandling Remains Low Despite More Frequent/Severe Storms

Reports of Mishandled (Lost/Delayed/Damaged/Pilfered) Bags per 1,000 Passengers



Sources: DOT Air Travel Consumer Report (<http://www.dot.gov/airconsumer/air-travel-consumer-reports>)

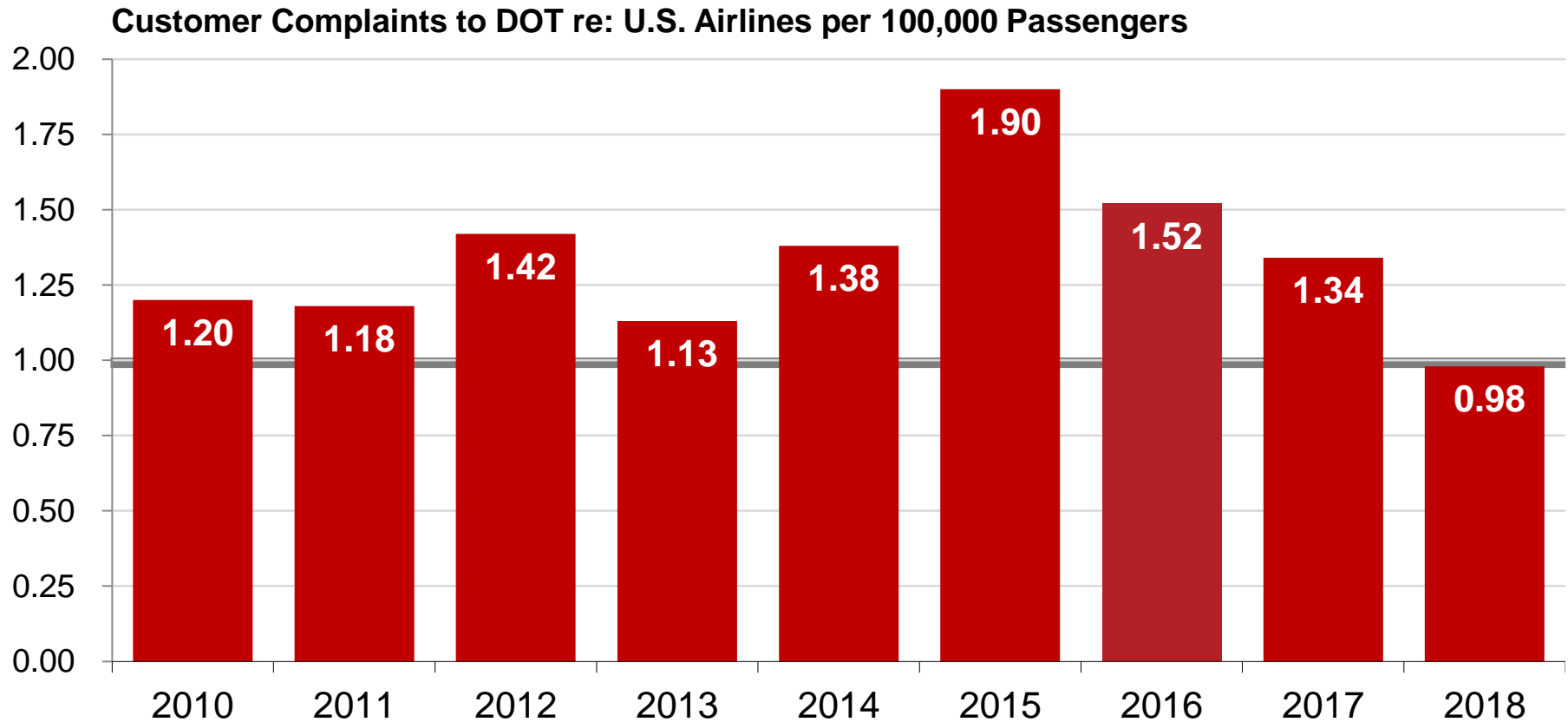
* Jan-Nov



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The Rate of Customer Complaints Fell for the Third Straight Year in 2018

Low Fares, Improved Communications, Online IROPS Resolution, Fewer Involuntary DBs



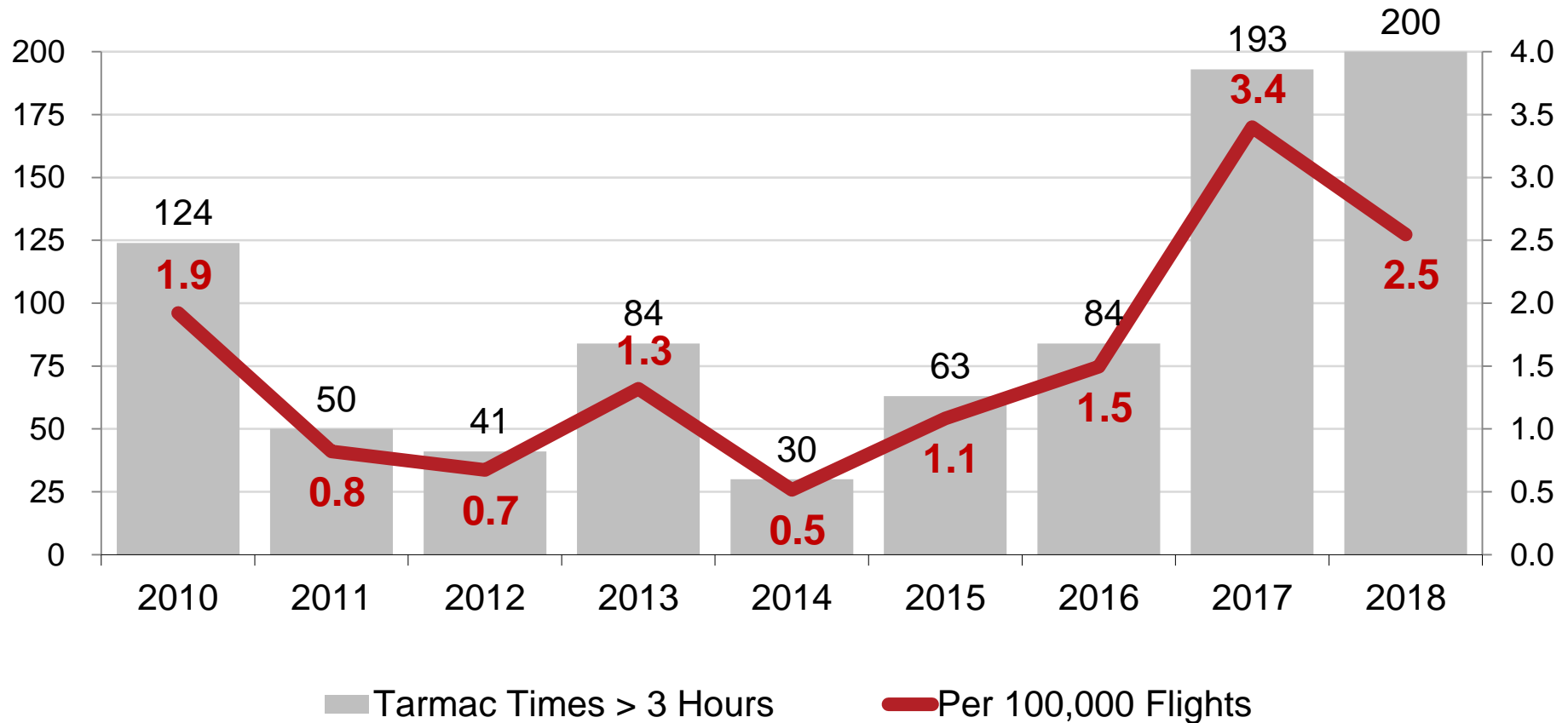
Sources: DOT *Air Travel Consumer Report* (<http://www.dot.gov/airconsumer/air-travel-consumer-reports>)



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Domestic Flight Tarmac Times Exceeding Three Hours: 2010-2018

By Year



Source: Bureau of Transportation Statistics: <https://transtats.bts.gov/TARMAC/>

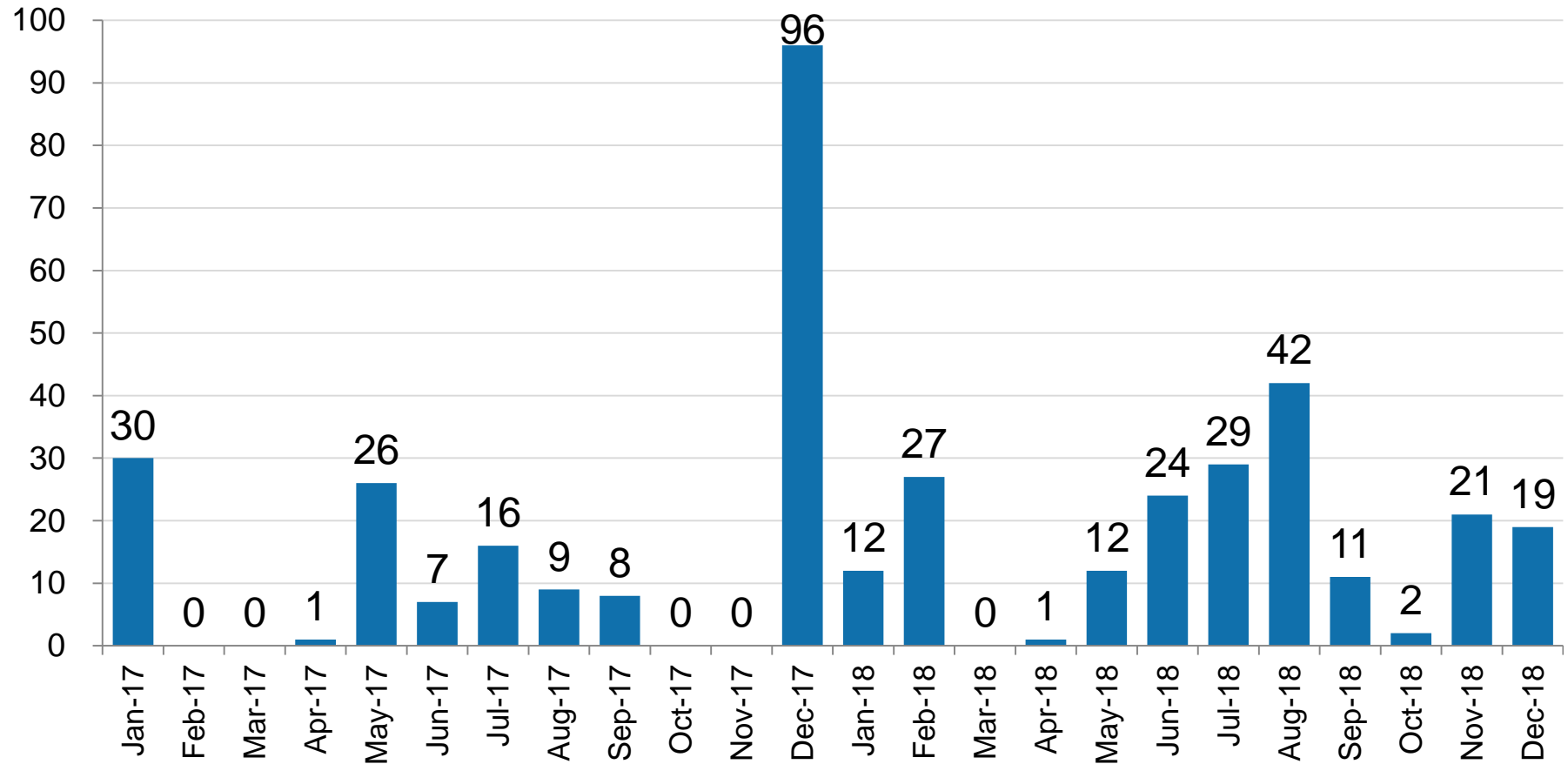
Note: DOT Tarmac Delay Rule Took Effect April 29, 2010



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Domestic Flight Tarmac Times Exceeding Three Hours: 2017-2018

By Month



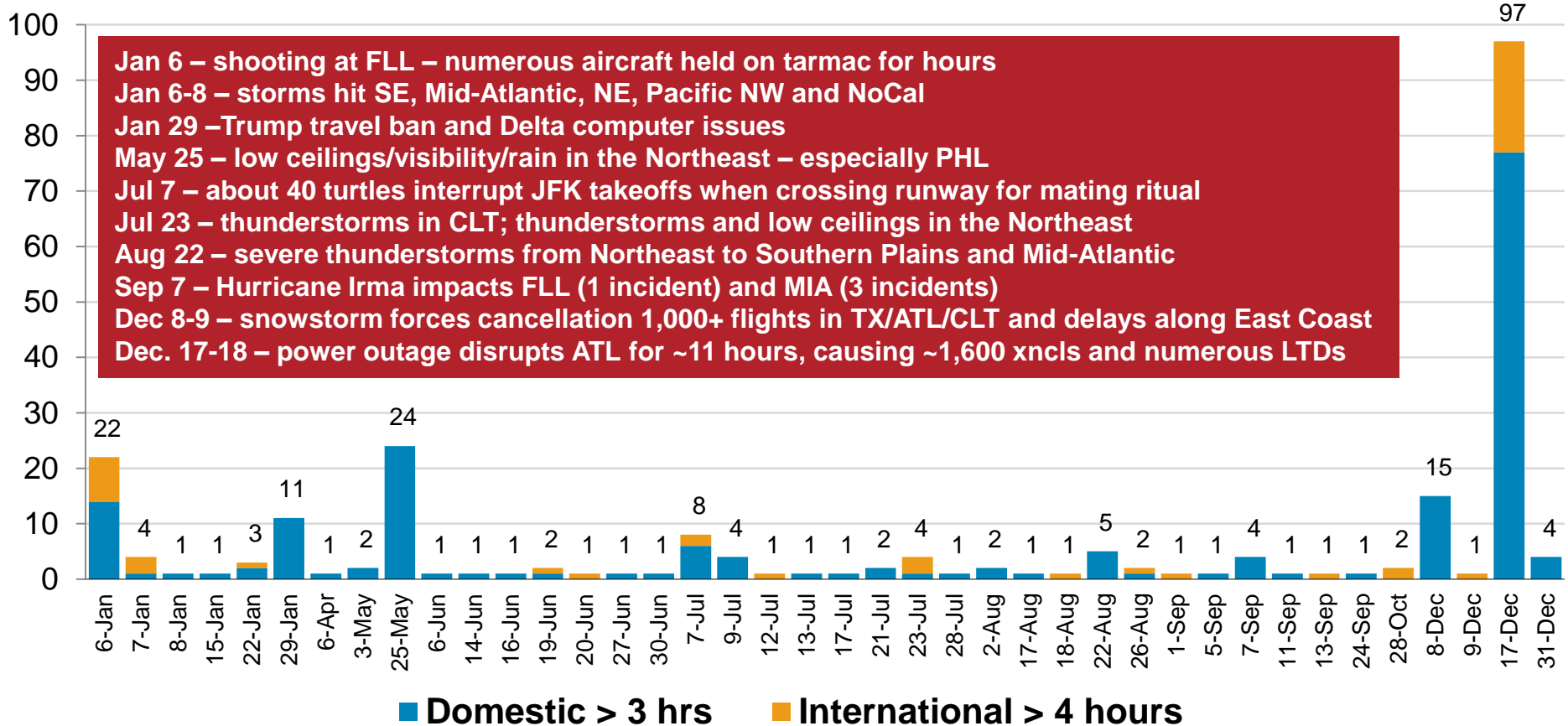
Source: Bureau of Transportation Statistics: <https://transtats.bts.gov/TARMAC/>



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2017: Days With Multiple Long Tarmac Delays Tied to Airport Shooting, Delta Computer Issues, Severe Weather, Turtle Mating and Half-Day Airport Power Outage

325 Days With Zero Long Tarmac Delays; 7 Days With 5+ (Including 5 With 10+)



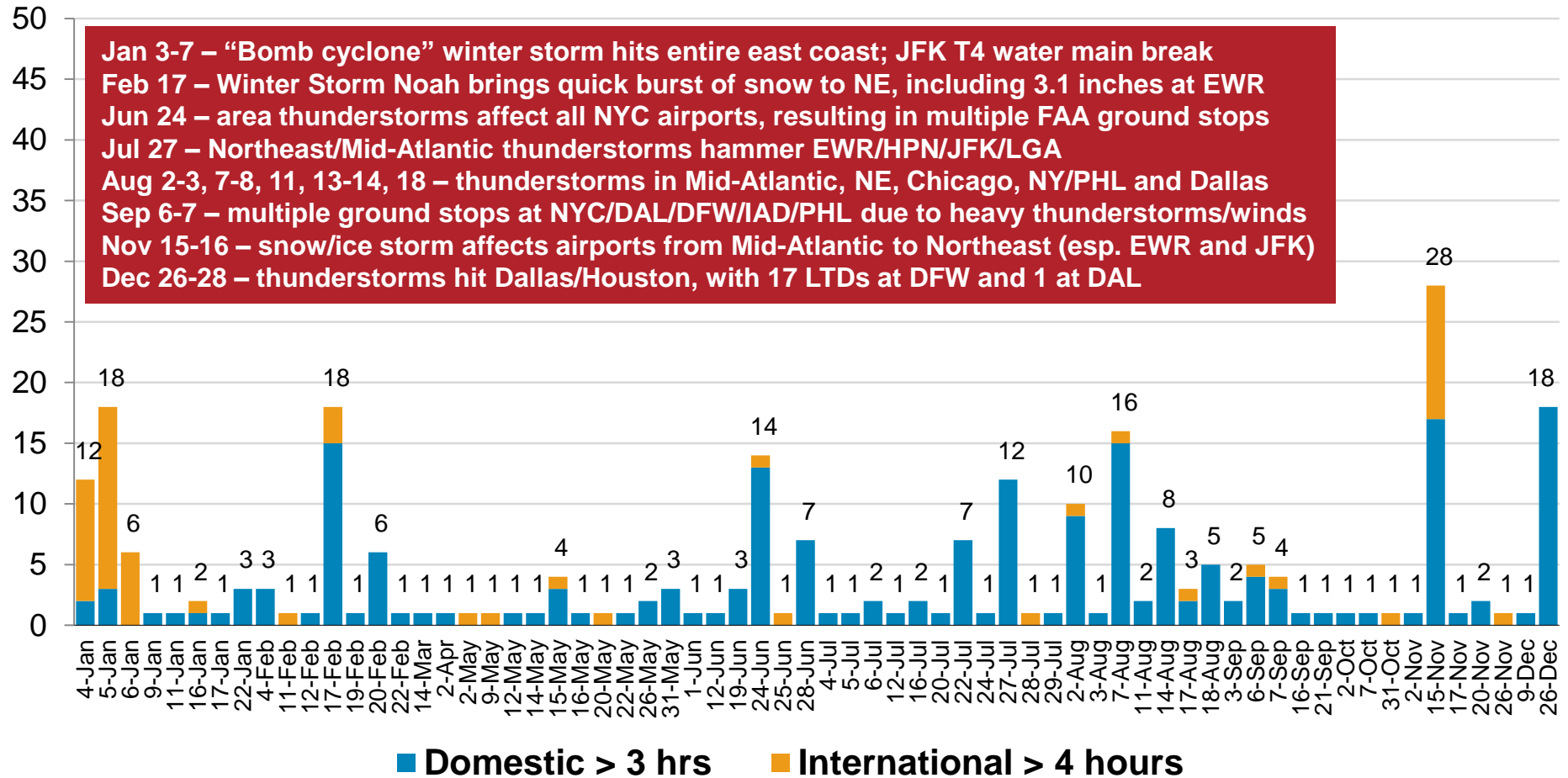
Source: A4A research and <https://www.bts.gov/topics/tarmac-times>



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2018: Days With Multiple Long Tarmac Delays Had Severe Weather / Ground Stops

299 Days With Zero Long Tarmac Delays; 16 Days 5+ (Including 9 With 10+)



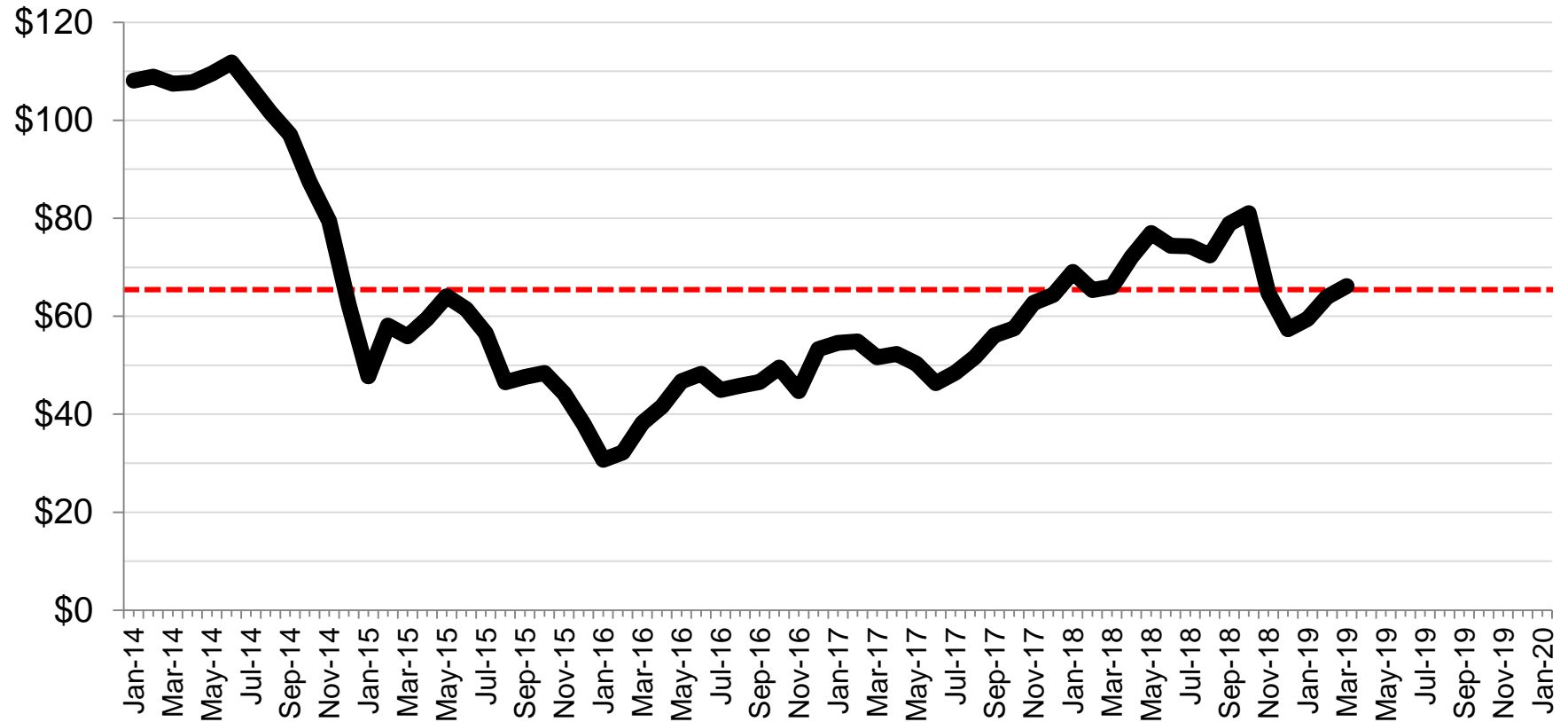
Source: A4A research and <https://www.bts.gov/topics/tarmac-times>



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Crude-Oil Prices Surged Jan. 2016-Oct. 2018, Plunged at End of 2018

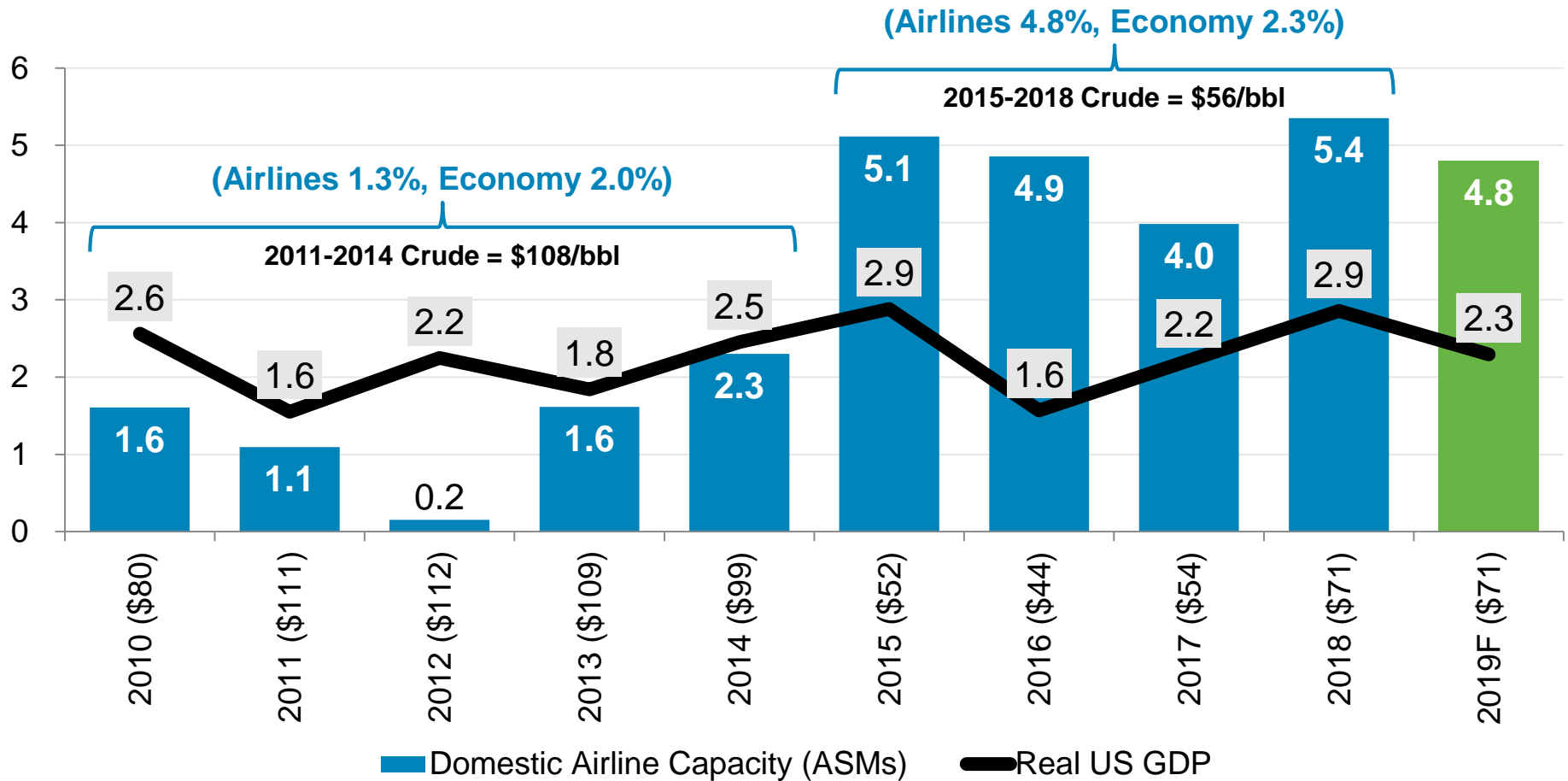
Spot Price* of Brent Crude Oil (\$ per Barrel)



Source: A4A and Energy Information Administration (http://www.eia.gov/dnav/pet/pet_pri_spt_s1_d.htm)

In 2014-2018, Domestic Airline Capacity Grew at Twice the Rate of the U.S. Economy

Throughout the Business Cycle, Capacity Has Fluctuated With the Price of Crude Oil*



Source: Bureau of Economic Analysis and published airline schedules via Diio Mi

* Brent crude oil in dollars per barrel, shown next to each year

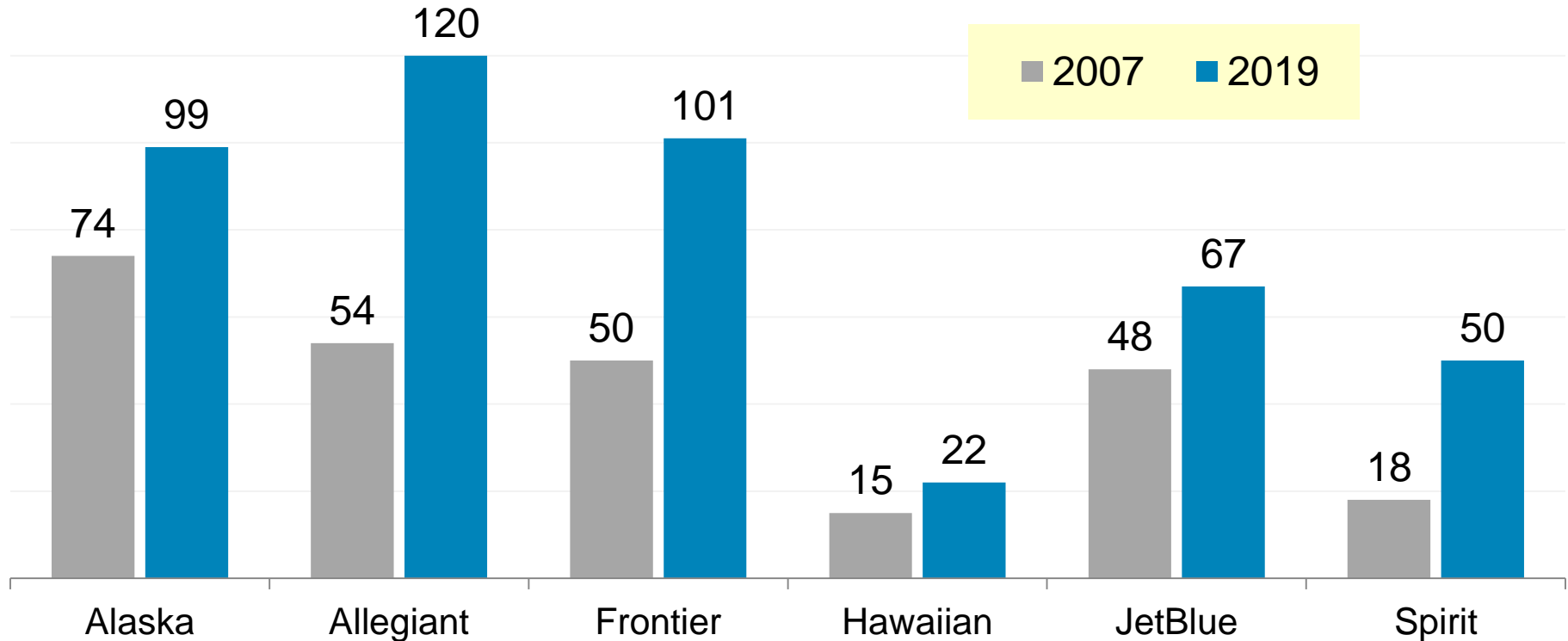


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Smaller U.S. Carriers Are Serving More and More Domestic Markets

Competitive Presence of Low-Cost and Ultra Low-Cost Carriers Continues to Expand

Number of U.S. Airports Served*



Source: Innovata (via Diio Mi) schedules as of March 15, 2019, for selected marketing airlines including predecessors

* July 15-21 of each year



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Los Angeles-Seattle Is Among Countless Domestic City Pairs on Which Competition* Has *Increased* Since 2007 (Real Fares *Down* 20%, Passengers *Up* 78%)

2007 O&D Passenger Share



1Q-3Q18 O&D Passenger Share



Source: DOT Data Bank 1B and Innovata published schedules via Diio Mi

* Defined as carrying at least 5 percent of O&D passengers between BUR/LAX/LGB and SEA



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Boston-Akron/Cleveland Is Among Countless Domestic City Pairs on Which Competition* Has *Increased* Since 2007 (Real Fares *Down* 20%, Passengers *Up* 23%)

2007 O&D Passenger Share



1Q-3Q18 O&D Passenger Share



Source: DOT Data Bank 1B and Innovata published schedules via Diio Mi

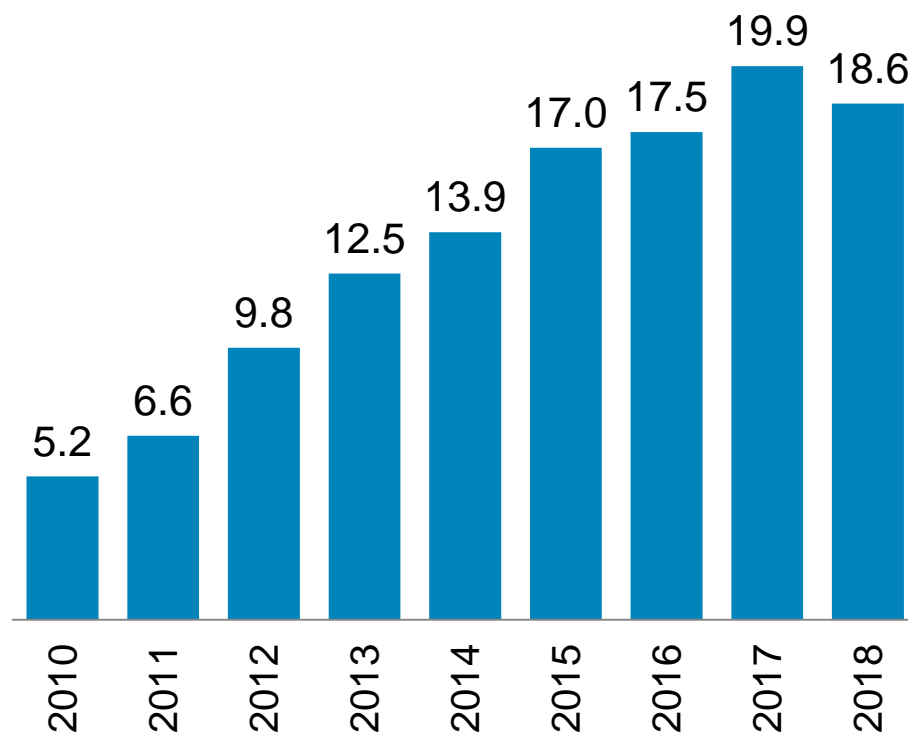
* Defined as carrying at least 5 percent of O&D passengers between BOS and CAK/CLE



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Substantial U.S. Passenger Airline Capital Investment* Continued in 2018 Despite Waning Profits – Bringing Total for This Business Cycle to \$121 Billion

U.S. Passenger Airline Capital Expenditures* \$ Billions per Year

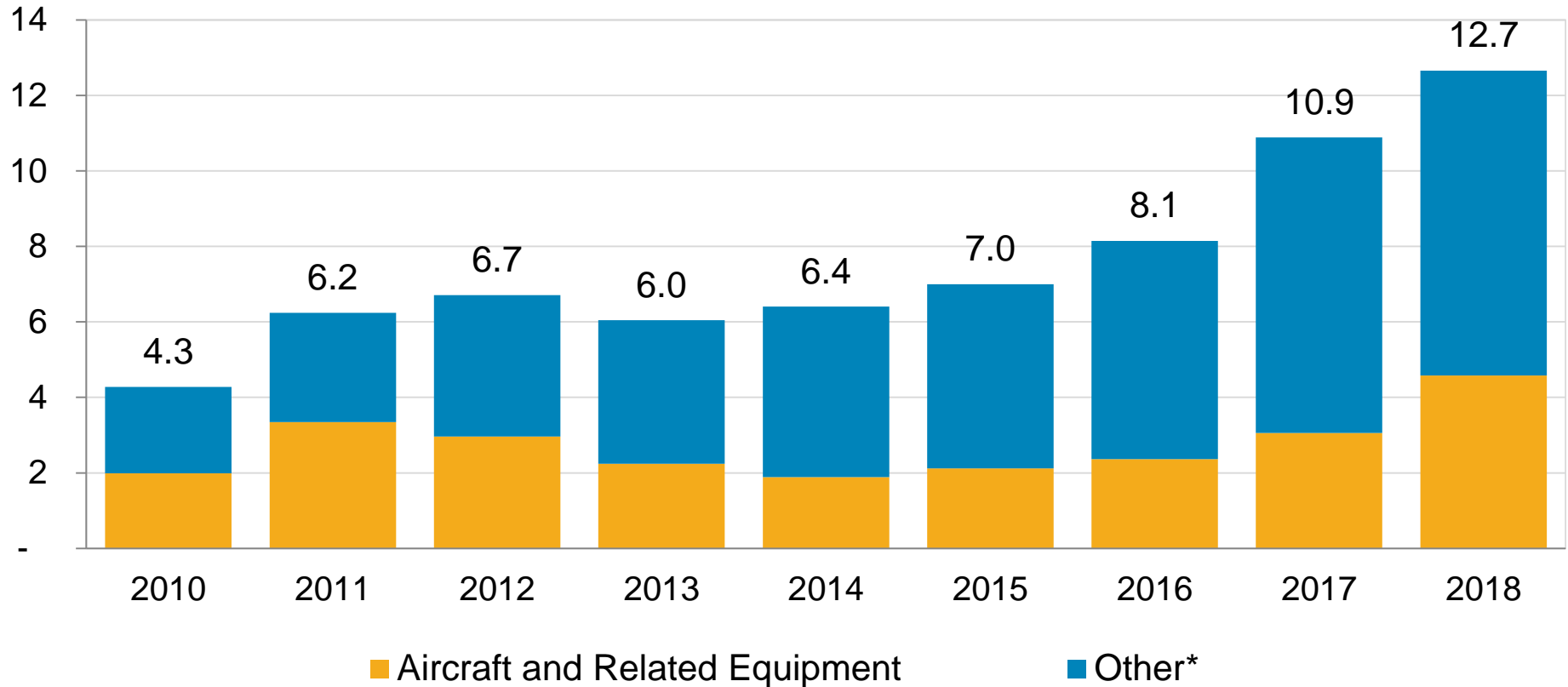


- » As of YE18, firm orders for 1,717 aircraft valued at \$88B
 - Expecting deliveries to average ~ one new aircraft per day in 2019
- » Additionally, several billion dollars in commitments for ground equipment, facilities and information technology

* Includes payments made for aircraft and other flight equipment, ground and other property and equipment, airport and other facility construction and information technology
Source: SEC filings of Alaska, Allegiant, American, Delta, Hawaiian, JetBlue, Southwest, Spirit, United and merged/acquired predecessors

Capital Expenditures on the Rise for U.S. Cargo Airlines

\$ Billions by Fiscal Year for Atlas, FedEx and UPS



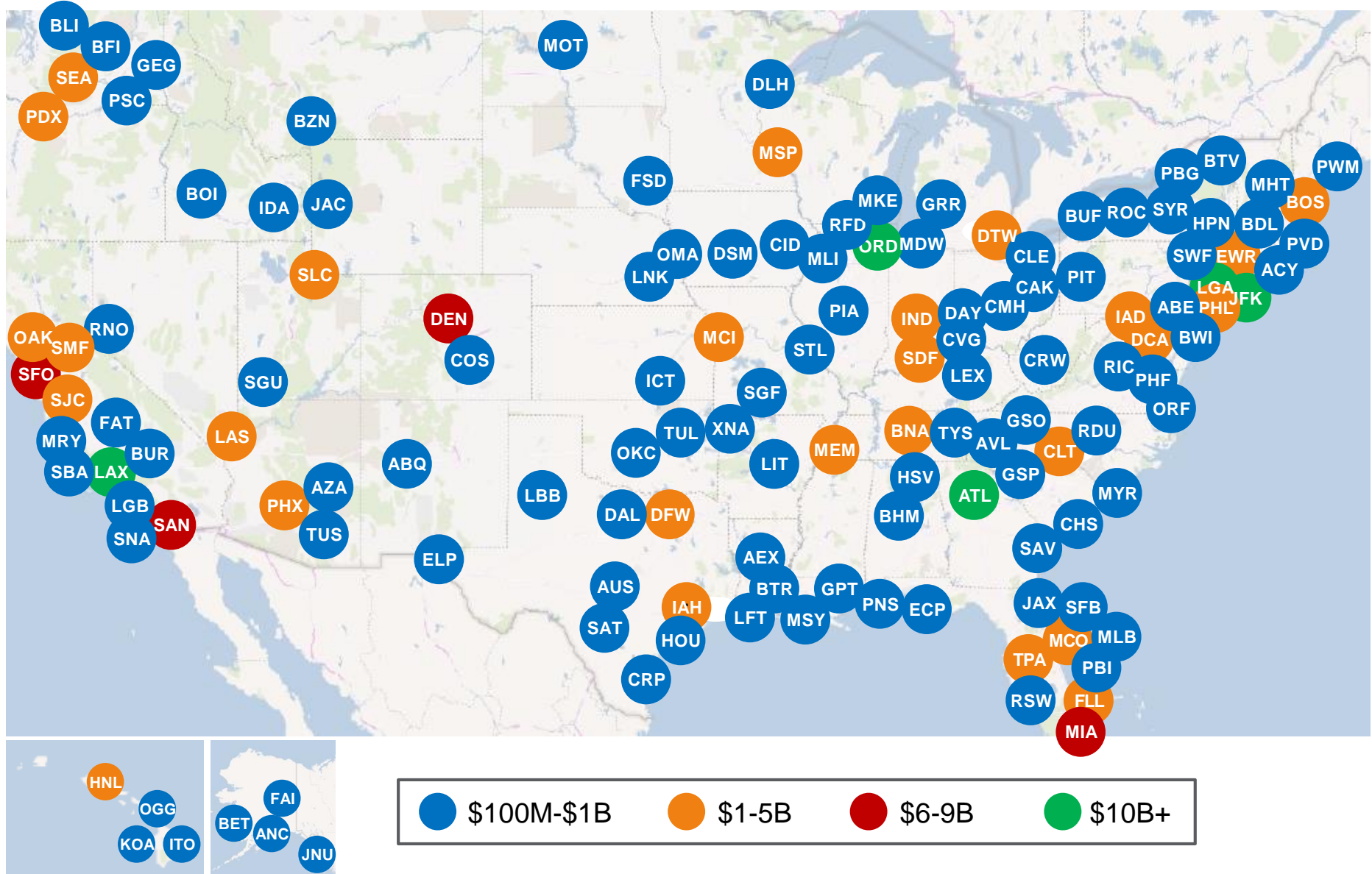
Source: SEC filings of Atlas, FedEx and UPS

* Facilities, vehicles, information technology, package handling and ground support equipment



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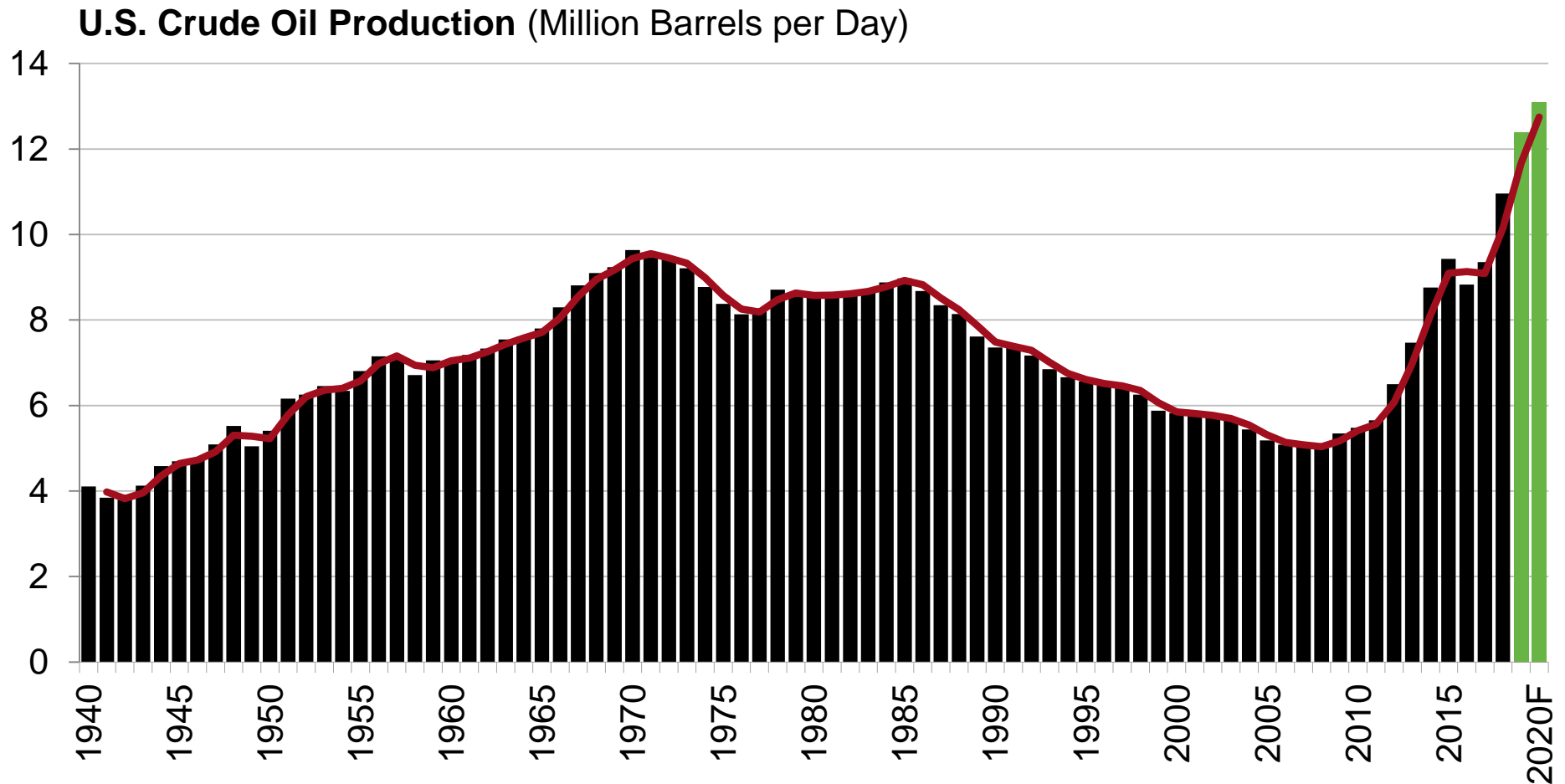
Airport Investment Is Booming Across the United States*



* A4A research (capital projects completed, underway or approved since 2008 at 30 large hub airports) and FAA Form 127 reports (capital expenditures and construction in progress, 2009-2018)

U.S. Crude Oil Production Reached an All-Time High 10.96M Barrels per Day in 2018

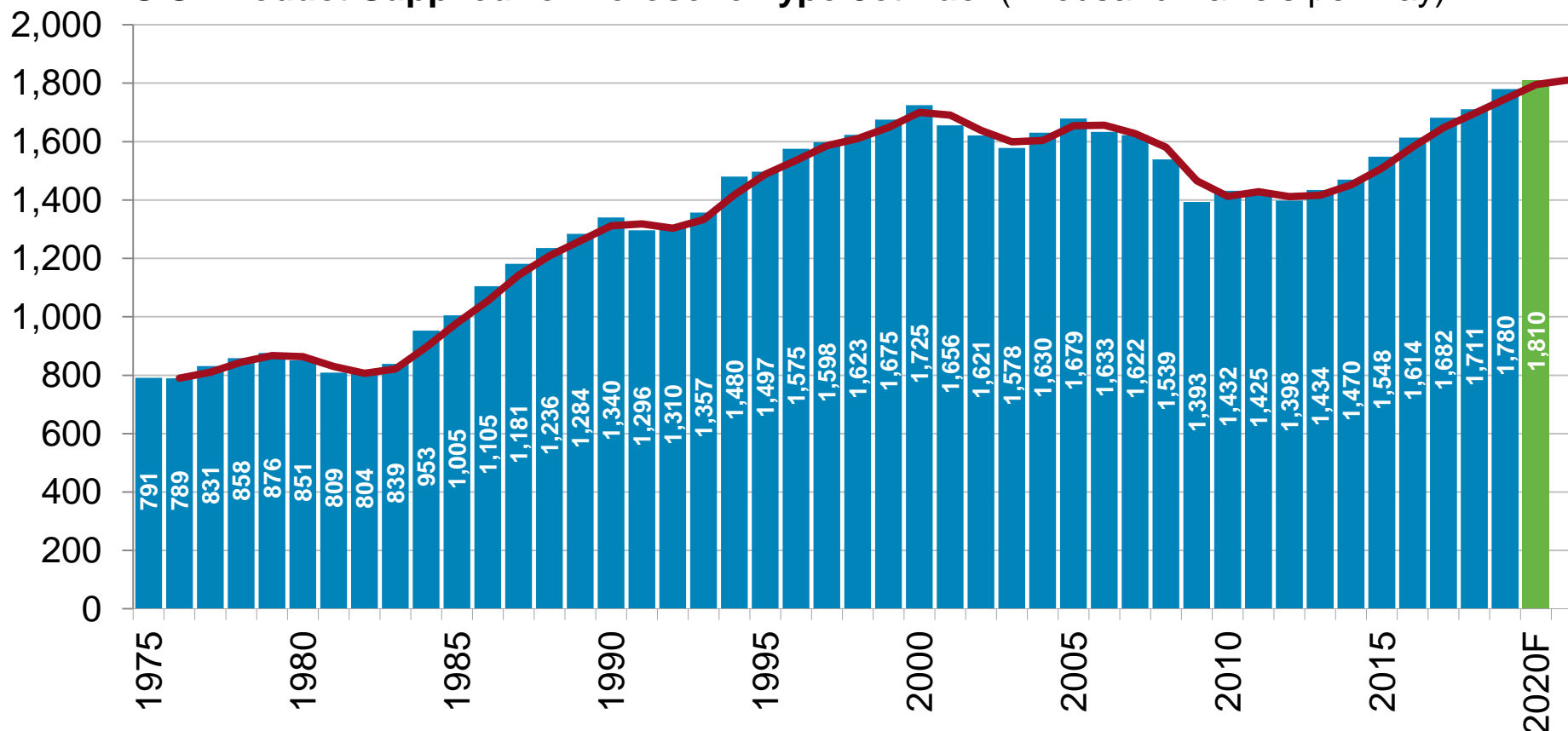
EIA Projects Production to Grow Further in 2019 (12.4M) and 2020 (13.1M)



Source: U.S. Energy Information Administration (EIA) history and Short-Term Energy Outlook (April 2019)

Total U.S.-Based Jet Fuel Demand¹ Expected to Reach All-Time High in 2019

U.S. Product Supplied² of Kerosene-Type Jet Fuel (Thousand Barrels per Day)



¹ Jet fuel supplied within the United States to all users (i.e., U.S. and foreign airlines, recreational and business aviation, civilian government, military)

² Per EIA, approximates consumption by measuring the disappearance of these products from primary sources (i.e., refineries, natural gas processing plants, blending plants, pipelines, bulk terminals). Generally computed as follows: field production, plus renewable fuels and oxygenate plant net production, plus refinery and blender net production, plus imports, plus net receipts, plus adjustments, minus stock change, minus refinery and blender net inputs, minus exports.

Source: U.S. Energy Information Administration (EIA) history and Short-Term Energy Outlook (April 2019)



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