

Airport Capacity

Trends at JFK

Presented to: JFK Roundtable

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Date: September 9, 2024



Federal Aviation
Administration



About the Presenter



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Topics

- Trends over time
- How JFK compares to other Large Hubs
- Primer on Airport Capacity

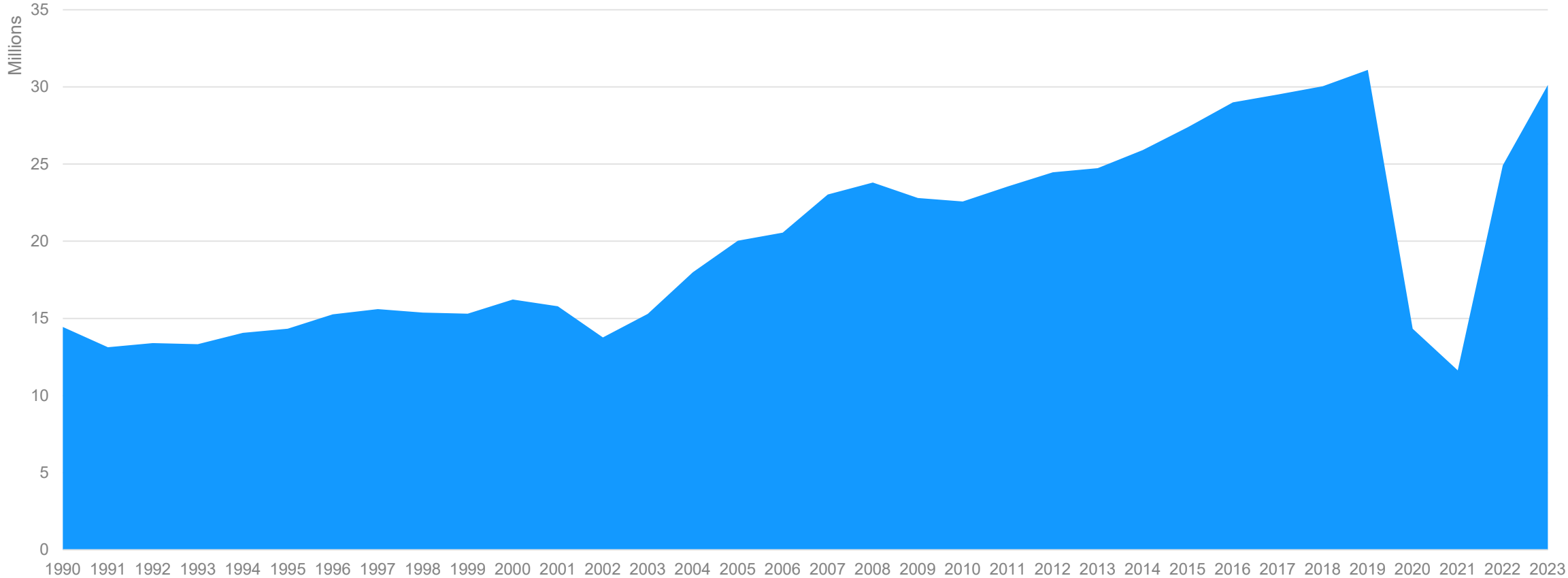


JFK Trends and Comparison to other Large Hubs



JFK Departing Passengers since 1990

Enplanements (Departing Passengers) by Federal Fiscal Year

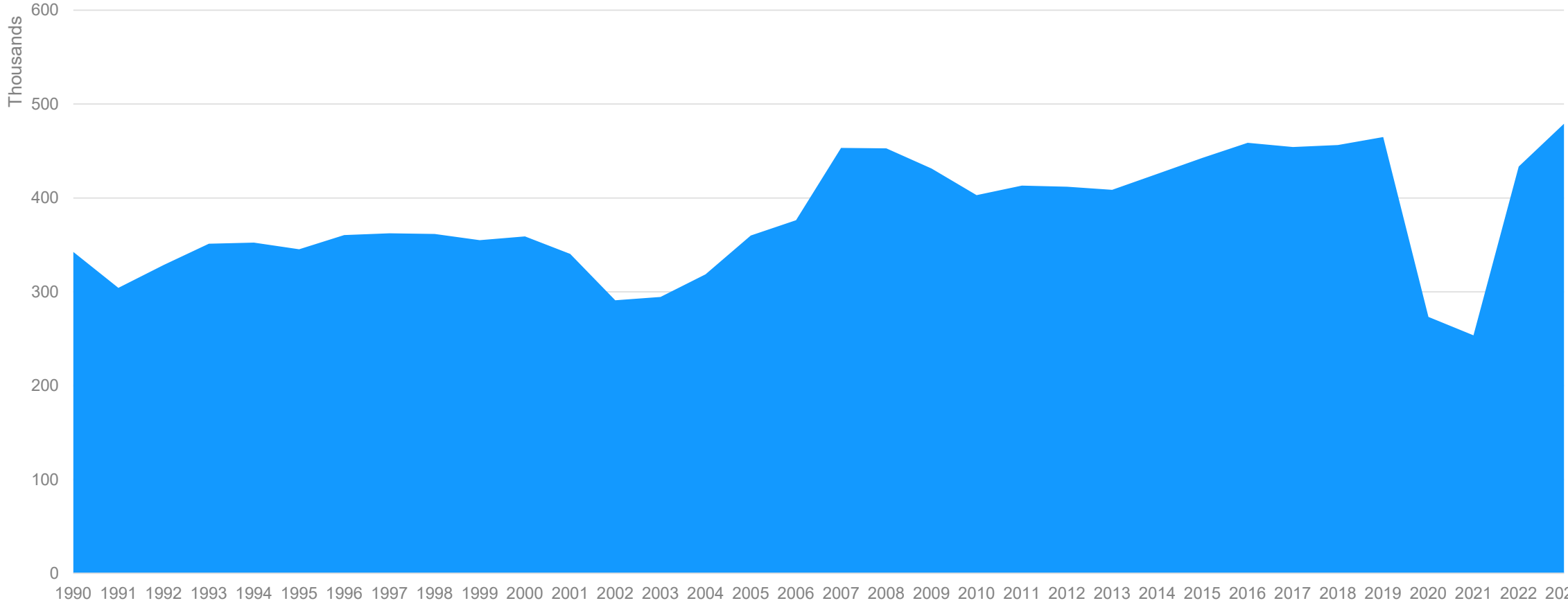


Source: FAA TAF



JFK Total Annual Aircraft Operations

Total Aircraft Operations by Federal Fiscal Year

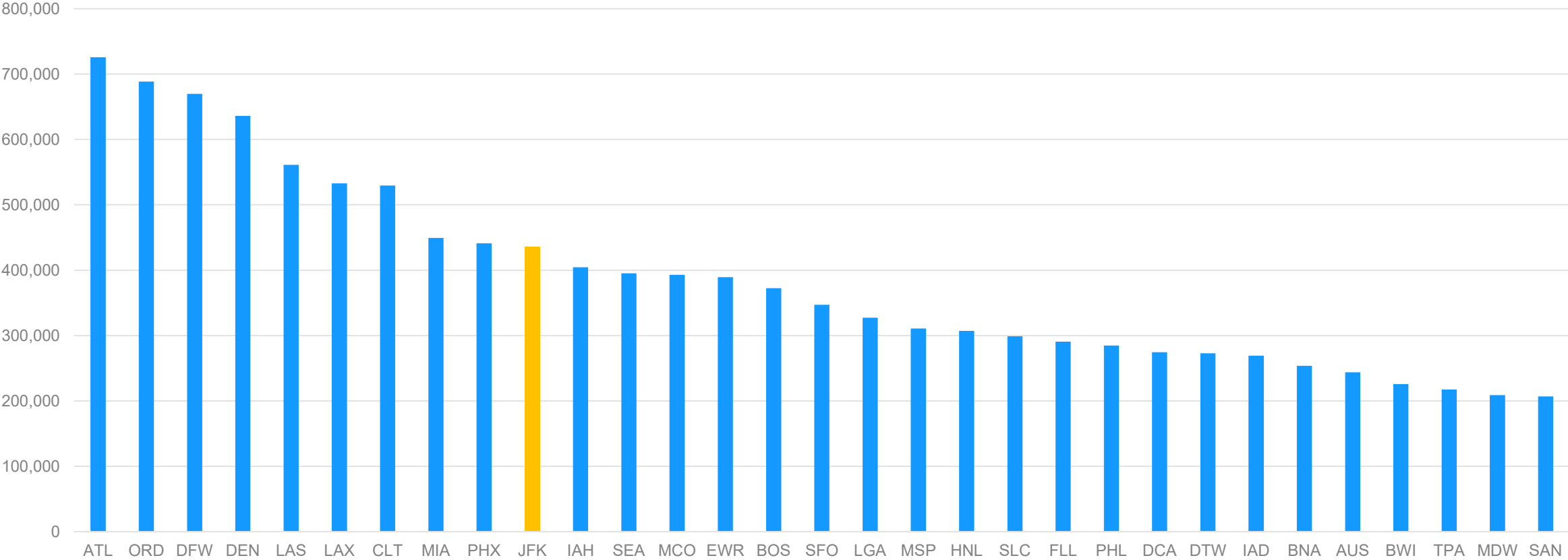


Source: FAA TAF



JFK is the 11th busiest Large Hub in US

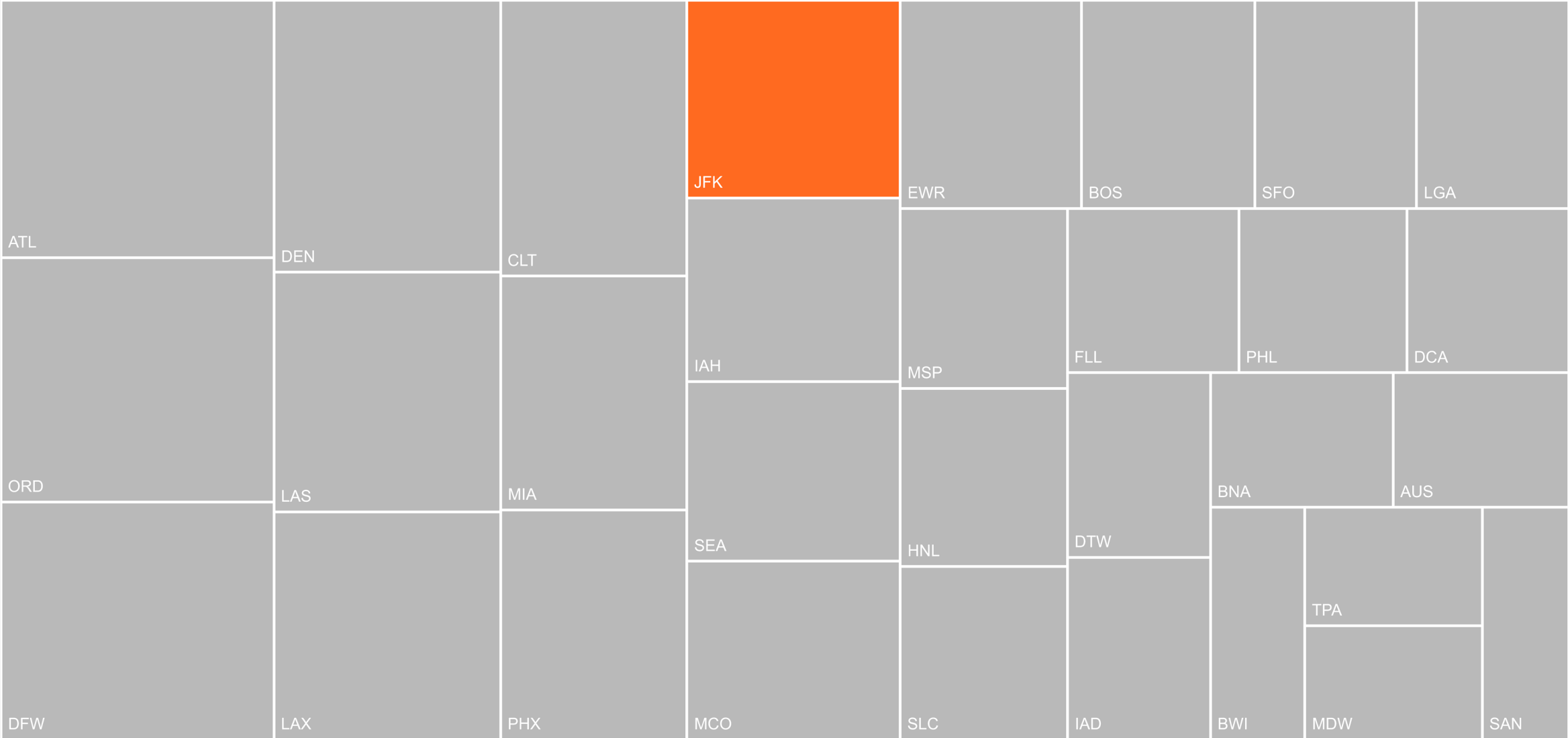
Total Aircraft Operations at Large Hubs, last 12 months



Source: ASPM



Total Aircraft Operations at Large Hubs, last 12 months



Source: ASPM



Primer on Airport Capacity



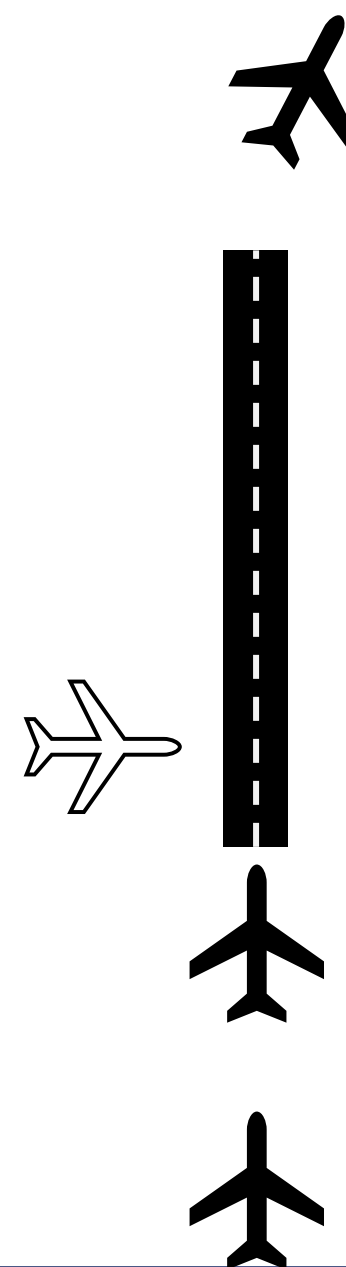
What is Airport Capacity?

- Airports are a system of systems
- Individual components each have unique “capacities” that can affect the overall operation of the airport
- Some “capacities” are flexible; some less so

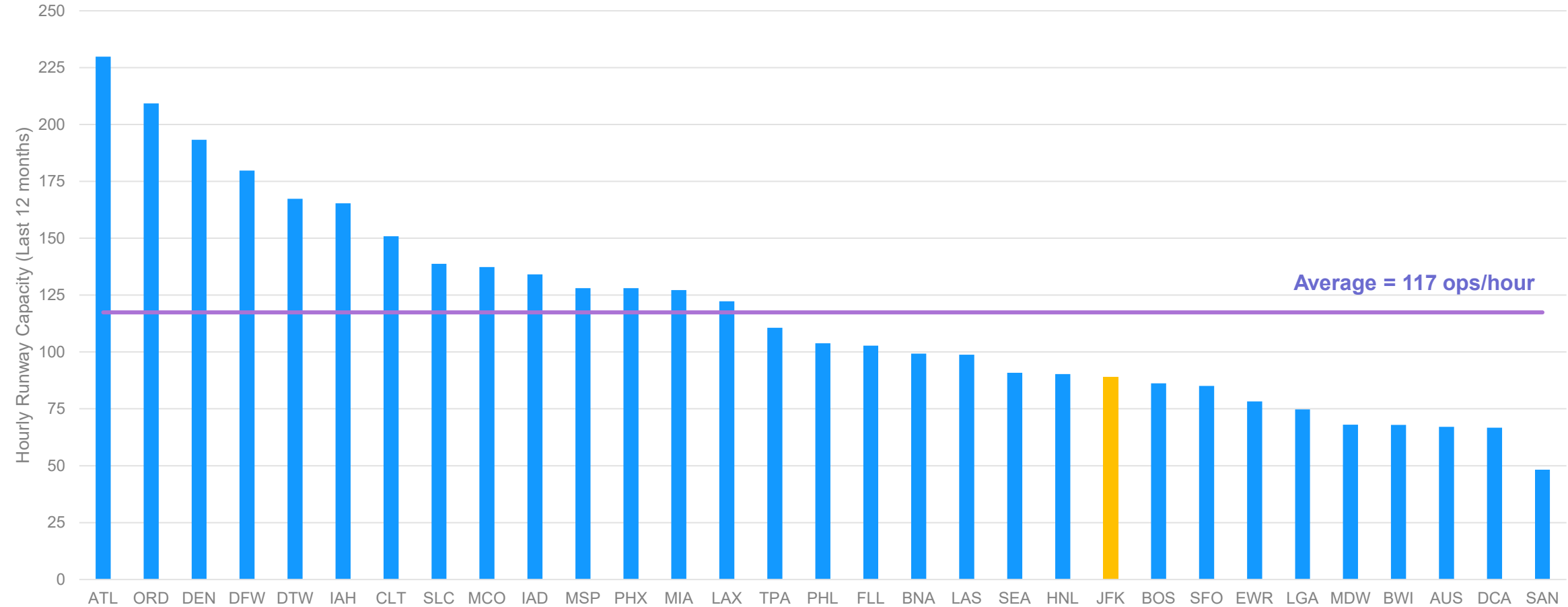


Runway Capacity

- Maximum number of aircraft operations (takeoffs, landings) that can be sustained on the runways
- Variables:
 - Weather (clear, fog, wind)
 - Airspace congestion with Thunderstorms
 - Configuration in use, and resulting dependencies
 - Mix of large and small aircraft (separation, wake turbulence, differences in speed)
- As aircraft operations approach runway capacity, delays grow exponentially
- Runway length matters for aircraft payload/range



Average Runway Capacity by Airport



Source: ASPM



Runway Capacity by Configuration

From 09/2023 To 08/2024 ; Airport=JFK

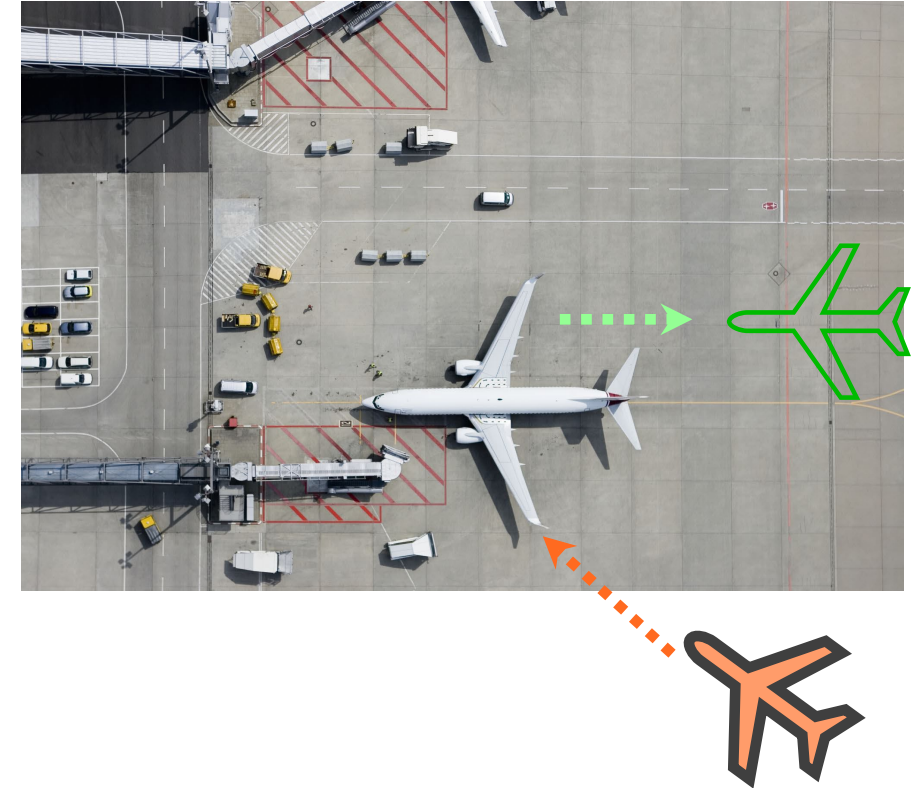
Runway (Arrivals/Departures)	Weather Impact	Percent of Hours	Average Taxi-Out Time	Average Taxi-In Time	Average Hourly Runway Capacity
31L, 31R 31L	None	20	24.3	9.9	93.9
22L, 22R 22R, 31L	None	13	22.9	13.0	89.8
22L, 22R 22R	None	12	25.9	11.4	81.5
4L, 4R 4L	None	9	24.4	11.2	86.2
13L, 22L 13R	None	9	27.6	10.8	94.2
4L, 4R 4L, 31L	None	9	23.5	12.8	92.5
22L, 22R 22R	Minor	4	33.2	13.3	78.1
22L, 22R 22R	Severe	3	33.5	13.6	77.3
4L, 4R 4L	Minor	3	28.5	12.2	84.9
4L, 4R 4L	Moderate	2	33.6	13.9	83.4
4L, 4R 4L	Severe	2	36.1	13.9	82.0
31L, 31R 31L	Minor	2	30.0	10.2	88.6
22L, 22R 22R	Moderate	2	38.5	13.8	77.6
22L, 22R 22R, 31L	Minor	1	27.1	14.0	86.1
4L, 4R 4L, 31L	Minor	1	25.3	13.9	89.9
13L 13R	None	1	24.7	9.8	72.9
22L 22R	None	1	18.4	9.3	72.9

Source: ASPM



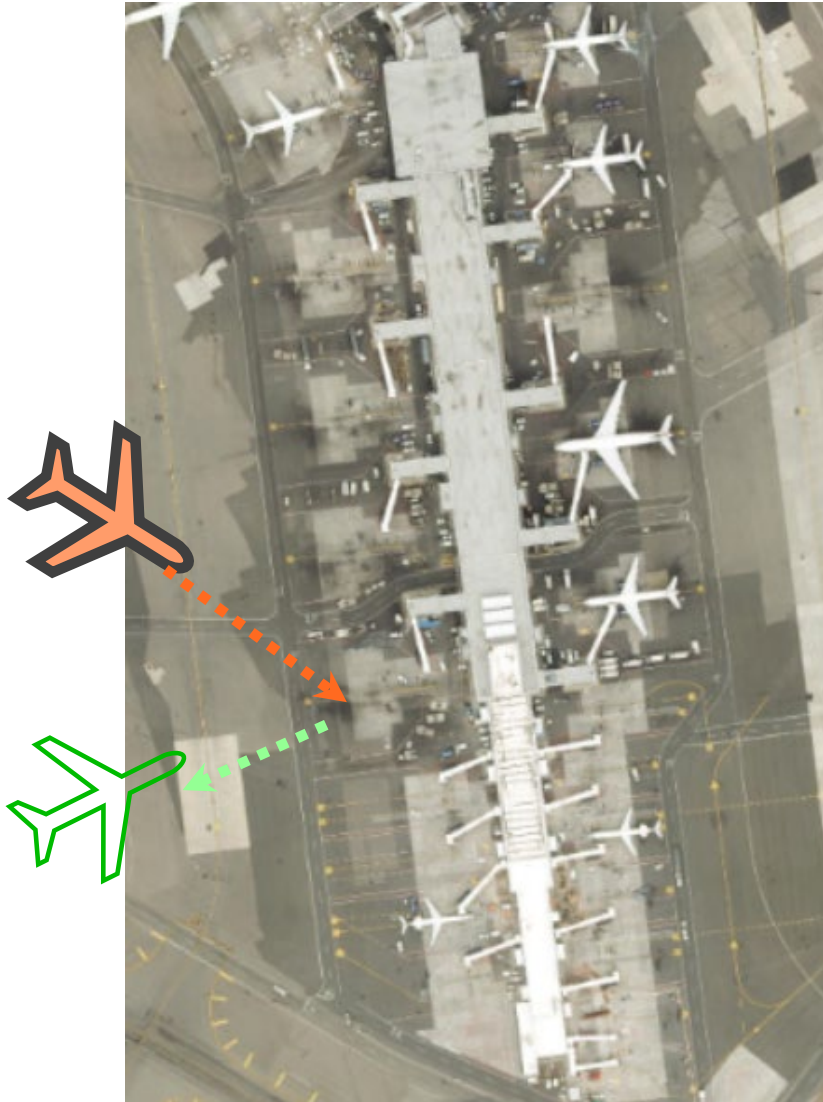
Gate “Turns”

- Each gate (e.g., jetbridge) can support 8-10 turns per day
 - A turn is the aircraft arriving to the gate, and then pushing back to depart
- Higher for domestic, narrowbody aircraft (e.g., E175, A320)
- Lower for widebody aircraft and international service that have more passengers or longer servicing times



Airports have a mix of Gates:

- Widebody Gates
- Narrowbody Gates
- Regional Jet Gates



Example Gated Flight Schedule

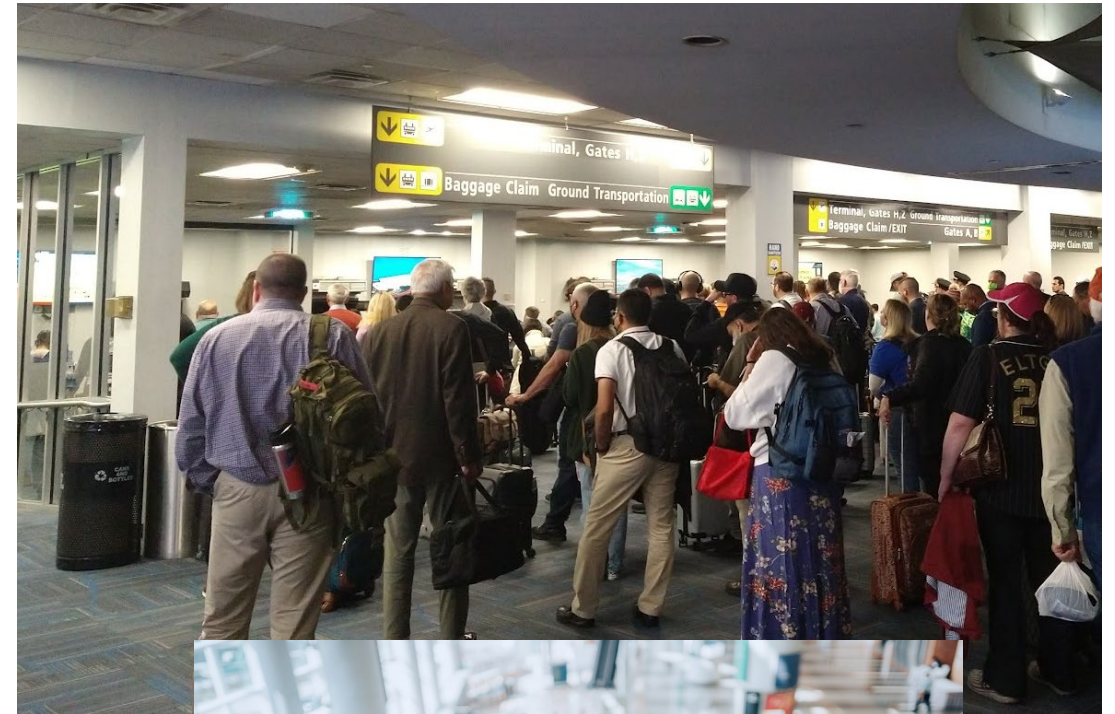
Position	Max Wingspan Acft	Max Length Acft	Depend Group
1A	A-321-NEO	A-321	
1	A-321-NEO	B-737-Max9	
2	A-321-NEO	B-737-Max9	
3	A-321-NEO	B-737-Max9	
4	A-321-NEO	B-737-Max9	
5	B-757-200	B-757-200	
6	DC-10-30	DC-10-30	
7	B-757-200	B-757-200	
8	B-767-300	B-767-300	
9	A-321-NEO	B-737-Max9	
10	A-321-NEO	B-737-Max9	
11	A-321-NEO	B-737-Max9	
12	A-321-NEO	B-737-Max9	
13	A-321-NEO	A-321-NEO	

< Start of Analysis Day																						End of Analysis Day >																					
12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM																				
						B-737-800WL WN /AUS	B-737-700WL WN DEN/BNA	B-737-700WL WN PHX/SMF				B-737-700WL WN SFO/SFO	B-737-700WL WN PDX/BWI		B-737-700WL WN SJC/DEN			B-737-700WL WN DEN/SMF			B-737-700WL WN SEA/TUS		B-737-700WL WN PHX/																				
						B-737-700WL WN /SJC	B-737-800WL WN /SMF	B-737-700WL WN SFO/SFO				B-737-800WL WN MDW/BWI	B-737-700WL WN SJC/AUS		B-737-700WL WN SJC/SJC			B-737-700WL WN OAK/SEA	B-737-700WL WN AUS/MCI	B-737-700WL WN PDX/PDX			B-737-700WL WN LAS/OAK	B-737-800WL WN BNA/																			
						B-737-700WL WN /SFO		B-737-700WL WN OAK/DAL	B-737-800WL WN SMF/PHX				B-737-700WL WN DAL/PHX		B-737-700WL WN OAK/SMF	B-737-700WL WN SLC/SMF	B-737-700WL WN SMF/LAS		B-737-700WL WN LAS/LAS	B-737-800WL WN HOU/SMF			B-737-700WL WN SFO/DEN	B-737-700WL WN PDX/																			
							B-737-700WL WN /OAK	B-737-700WL WN PHX/HOU	B-737-700WL WN SJC/SJC				B-737-700WL WN OAK/DEN		B-737-700WL WN LAS/LAS	B-737-700WL WN SFO/SFO			B-737-800WL WN HOU/HOU			B-737-700WL WN SMF/ABQ		B-737-700WL WN SJC/LAS	B-737-800WL WN BWI/																		
						B-737-700WL WN /SMF		B-737-700WL WN SJC/LAS	B-737-700WL WN SEA/OAK				B-737-700WL WN SFO/MSY		B-737-700WL WN SMF/SFO	B-737-700WL WN EWR/OAK			B-737-700WL WN LAS/OAK	B-737-800WL WN MSY/SAT	B-737-800WL WN SMF/STL			B-737-700WL WN OAK/OAK	B-737-700WL WN STL/	B-737-700WL WN SFO/																	
							B-737 Max 8 WN /PDX		B-737-700WL WN DEN/ABQ				B-737-800WL WN BNA/IND		B-737-700WL WN SMF/SJC			B-737-700WL WN SAT/BOI		B-737 Max 8 WN MKE/DAL			B-737-700WL WN OAK/OAK		B-737-700WL WN MCI/OAK	B-737-700WL WN OAK/																	
						B-737-700WL WN /BWI	B-737-700WL WN ABQ/MCI			B-737-700WL WN HOU/SMF				B-737-800WL WN ATL/RNO			B-737-800WL WN MCO/MDW			B-737-700WL WN SJC/SJC	B-737-700WL WN AUS/AUS			B-737-700WL WN PHX/RNO	B-737-700WL WN OAK/PHX	B-737-700WL WN DEN/																	
						B-737-700WL WN /LAS	B-737-700WL WN SMF/PHX		B-737-800WL WN OAK/STL				B-737-800WL WN DEN/SJC		B-737-800WL WN LAS/SMF			B-737-700WL WN IND/TUS		B-737-700WL WN STL/SJC	B-737-700WL WN SMF/PHX			B-737-700WL WN SFO/SFO	B-737-700WL WN BOI/SFO	B-737 Max 8 WN MDW/																	
						B-737-700WL WN /SFO		B-737-700WL WN LAS/SEA					B-737-700WL WN SJC/MCO		B-737-700WL WN TPA/SJC			B-737-700WL WN SMF/SMF		B-737-700WL WN SJC/SJC			B-737-700WL WN LAS/PHX		B-737-700WL WN LAS/LAS	B-737-700WL WN LAS/																	
						B-737-700WL WN /PHX		B-737-700WL WN RNO/DEN					B-737-700WL WN AUS/DAL		B-737-700WL WN PHX/DEN					B-737-700WL WN BWI/PDX			B-737-700WL WN SJC/MDW	B-737-700WL WN TUS/LAS		B-737-700WL WN DEN/ABQ	B-737-700WL WN ABQ/																
						B-737-700WL WN /DEN	B-737-800WL WN OAK/SJC	B-737-700WL WN DAL/DAL					B-737-700WL WN LAS/LAS	B-737-700WL WN SAT/SFO		B-737-800WL WN MKE/MKE	B-737-800WL WN MDW/HOU			B-737-700WL WN OAK/PHX	B-737-800WL WN MDW/DAL			B-737-700WL WN SFO/SFO	B-737-700WL WN RNO/AUS	B-737-700WL WN SMF/SMF	B-737-700WL WN EWR/																
						B-737-700WL WN /EWR		B-737-800WL WN DAL/OAK	B-737-700WL WN PDX/SJC				B-737-800WL WN PHX/MDW			B-737-700WL WN SFO/MKE				B-737-700WL WN SMF/SJC	B-737-800WL WN DAL/PHX			B-737-800WL WN SJC/SJC	B-737-700WL WN SJC/PHX	B-737-700WL WN OAK/																	
						B-737-800WL WN /MDW		B-737-700WL WN PHX/SAT	B-737-800WL WN MCI/EWR					B-737-700WL WN TUS/OAK		B-737-700WL WN LAS/LAS			B-737-800WL WN DEN/BNA	B-737-700WL WN PHX/PDX	B-737-800WL WN BWI/SMF			B-737-700WL WN PHX/OAK	B-737-700WL WN DAL/SJC	B-737-800WL WN LAS/																	
						B-737-700WL WN /SMF			B-737-700WL WN LAS/ATL					B-737-800WL WN BWI/TPA										B-737-700WL WN OAK/SJC		B-737-800WL WN AUS/																	



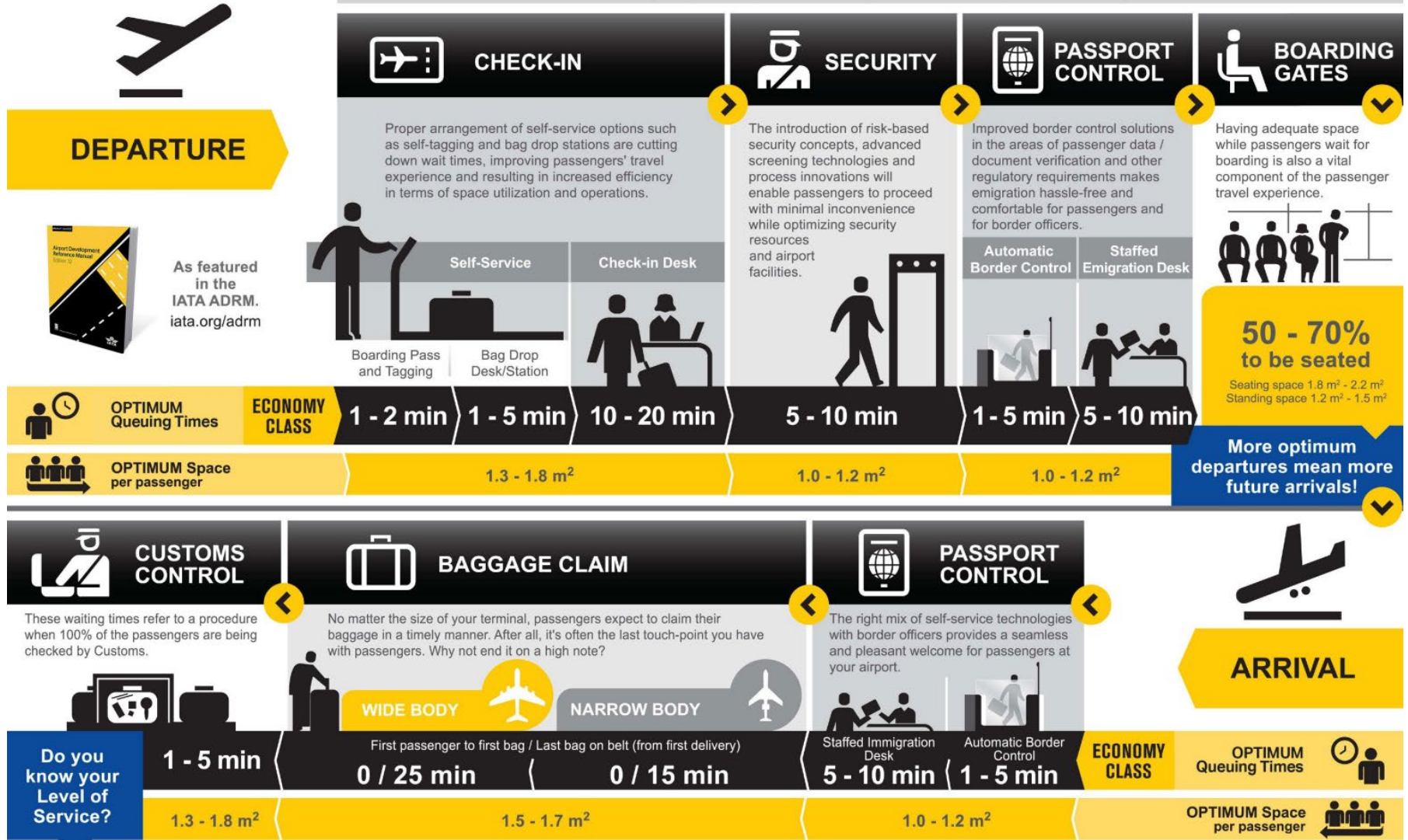
Passenger Terminal

- Includes Passenger Processing, Security Lines, Gate Waiting Areas, Concessions, Bathrooms
- Often referred to as capacity but “Level of Service” is often a better description
- More passenger congestion = lower Level of Service
- However, normally not constraining to aircraft operations



Is Your Airport Terminal Operating At An Optimum Level?

IATA's Level of Service (LoS) Concept is the industry benchmark for optimum passenger terminal facilities.



Summary

- **More passenger continue to be served on relatively fewer operations**
- **Runway capacity is often the primary limitation at an airport**
 - Airspace constraints, in particular with thunderstorms, will also cause significant delays and disruptions
 - Runway length matters for aircraft payload/range
- **Airlines schedule to available Gate Turns**
- **Passenger processing and space can be overly congested and result in a poor level of service**



References

- **FAA Advisory Circulars:**
 - AC 150/5060-5, Airport Capacity And Delay
 - AC 150/5360-13A, Airport Terminal Planning
- **Airport Cooperative Research Program:**
 - Report 55 on Passenger Level of Service and Spatial Planning for Airport Terminals
 - Report 79 on Evaluating Airport Capacity



