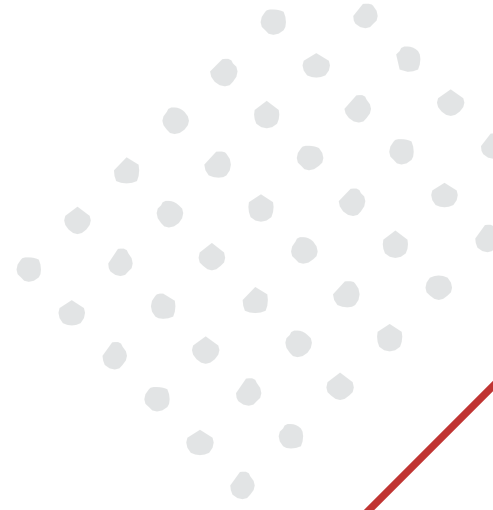


Runway Demand/Capacity Assumptions

Dallas Love Field Master Plan



PRESENTED TO
Dallas Airport System

PRESENTED BY
Ricondo

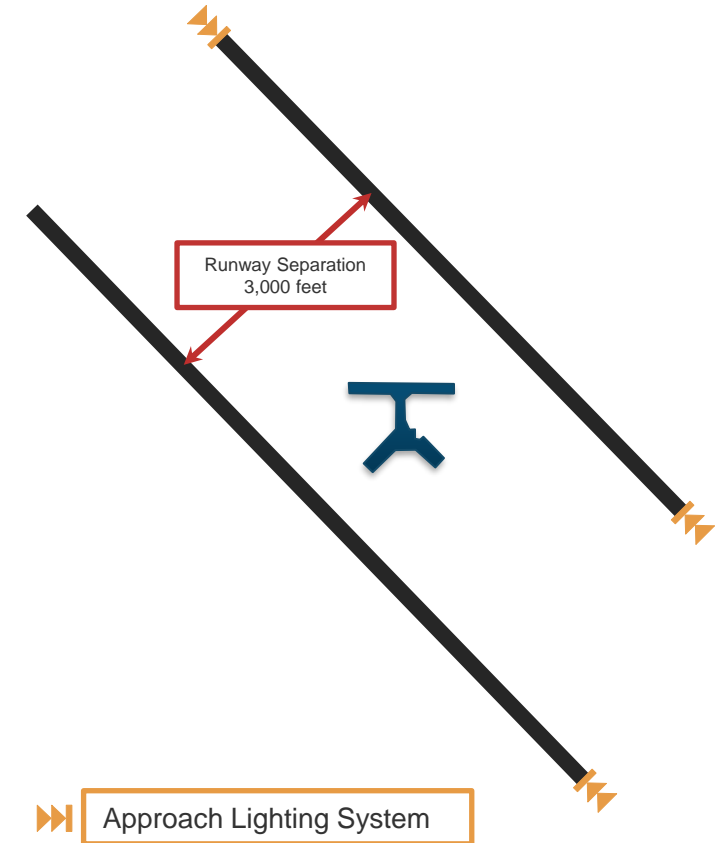
PRESENTED ON
June 10, 2024



Love What's Next
DALLAS LOVE FIELD MASTER PLAN

Runway Demand/Capacity Assumptions and Methodology

- Runway 13L-31R and 13R-31L are laterally separated by 3,000 feet.
 - Simultaneous independent parallel approaches are conducted in Visual Meteorological Conditions (VMC) but are and will not be possible in Instrument Meteorological Conditions (IMC)
 - Mixed arrival and departures to both runways in VMC
 - Segregated arrivals and departures in IMC
 - ❖ Arrivals on Runway 13L-31R
 - ❖ Departures on Runway 13R-31L
- Hourly runway demand/capacity analysis used
 - FAA declared arrival and departure rates from Aviation System Performance Metrics (ASPM)
 - 2023 Peak Month Average Day (PMAD) demand from CountOps
 - Future demand from Design Day Flight Schedule (DDFS)
- Analysis compared and calculated:
 - Hourly capacity to hourly demand to identify the number and magnitude of demand peaks exceeding capacity
 - Annual Service Volume (ASV) based on *Advisory Circular (AC) 150/5600-5 – Airport Capacity and Delay*

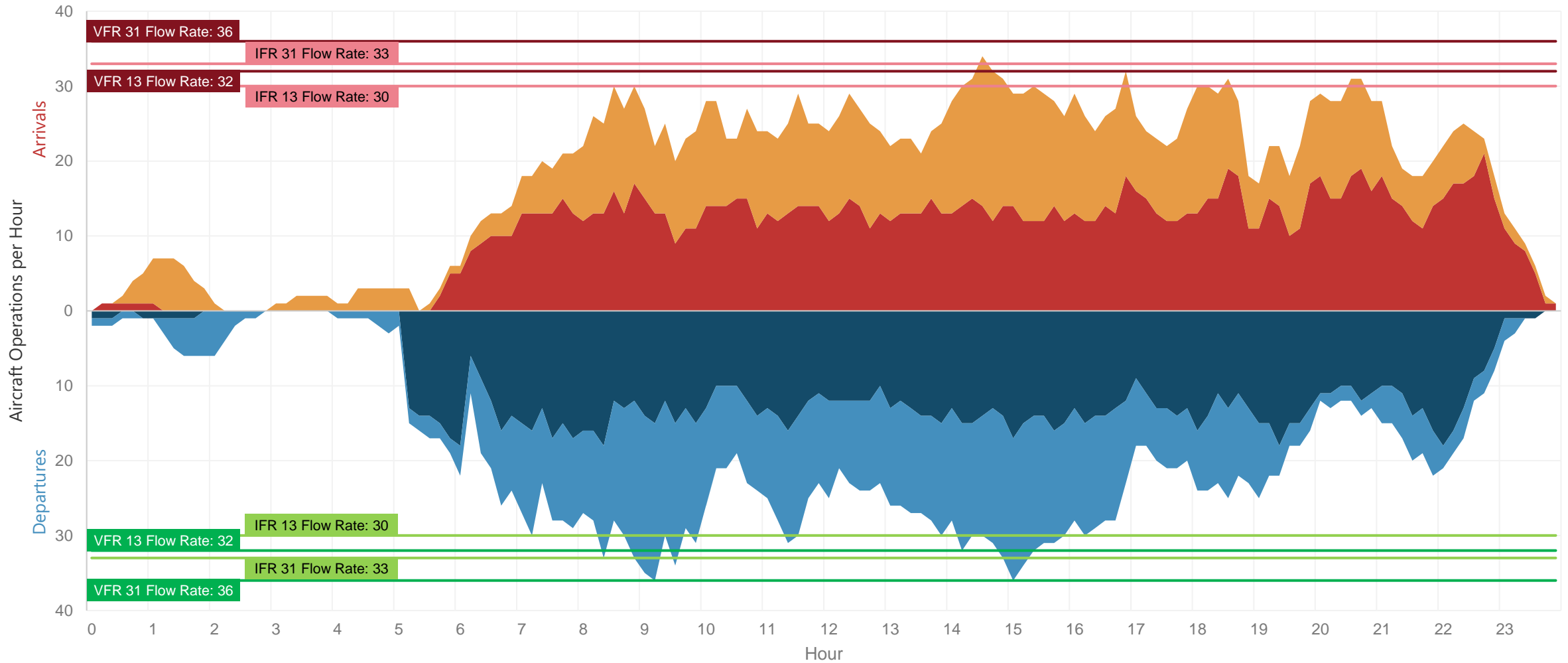


ASPM Configurations and FAA Declared Rates

- FAA Aviation System Performance Metrics (ASPM) used to determine operating configurations and declared rates
 - 87,648 hourly observations between January 1, 2014 and December 31, 2023.
 - Runway 13 flow (Southeast) was most common configuration.
 - Runway 31 flow (Northwest) most efficient with a declared rate of 72 operations per hour combined

Operating Configurations			Most Common Declared Rates		
Weather	Flow	Utilization	Arrivals	Departures	Total
VMC 83.3%	13	58.3%	32	32	64
	31	25.0%	36	36	72
IMC 16.7%	13	9.9%	30	30	60
	31	6.8%	33	33	66
Weighted Average			33	33	66

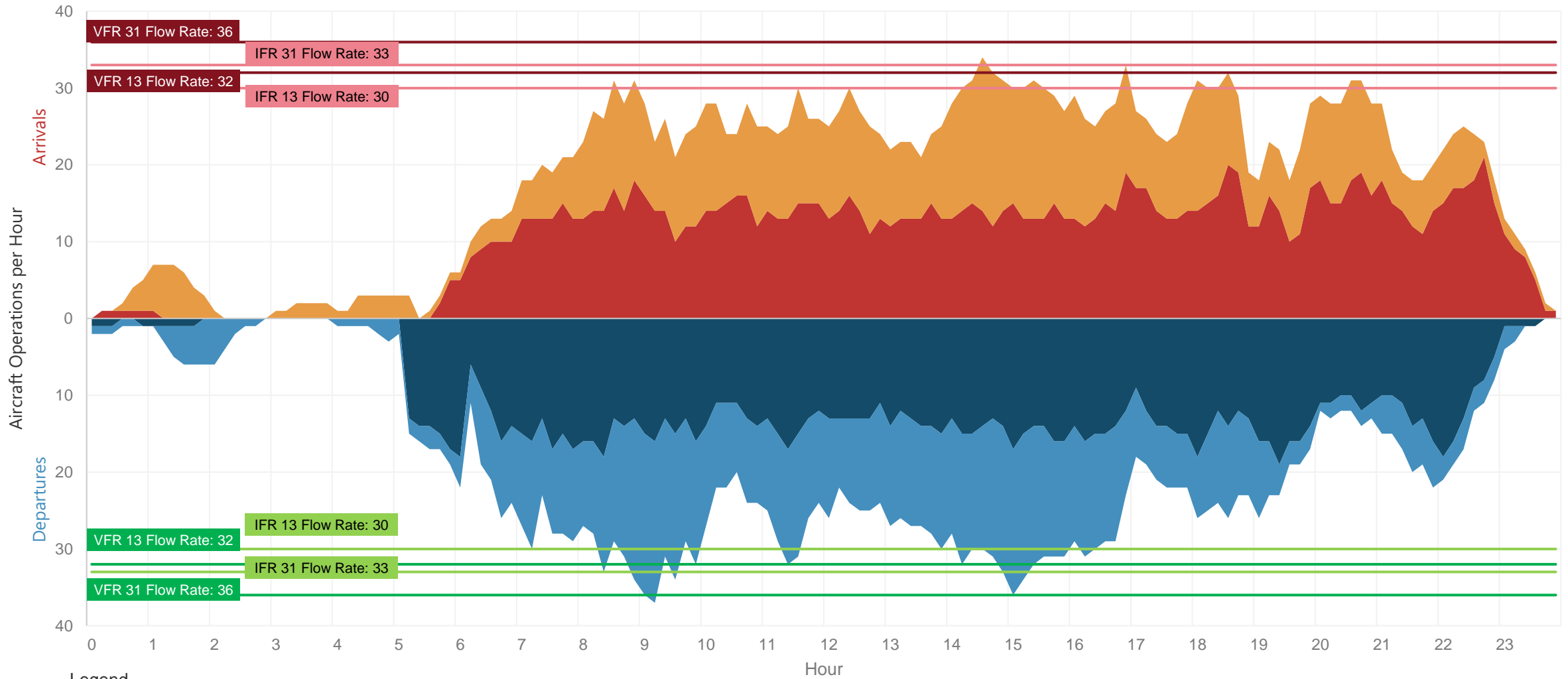
PAL 0 Demand and FAA Declared Rates



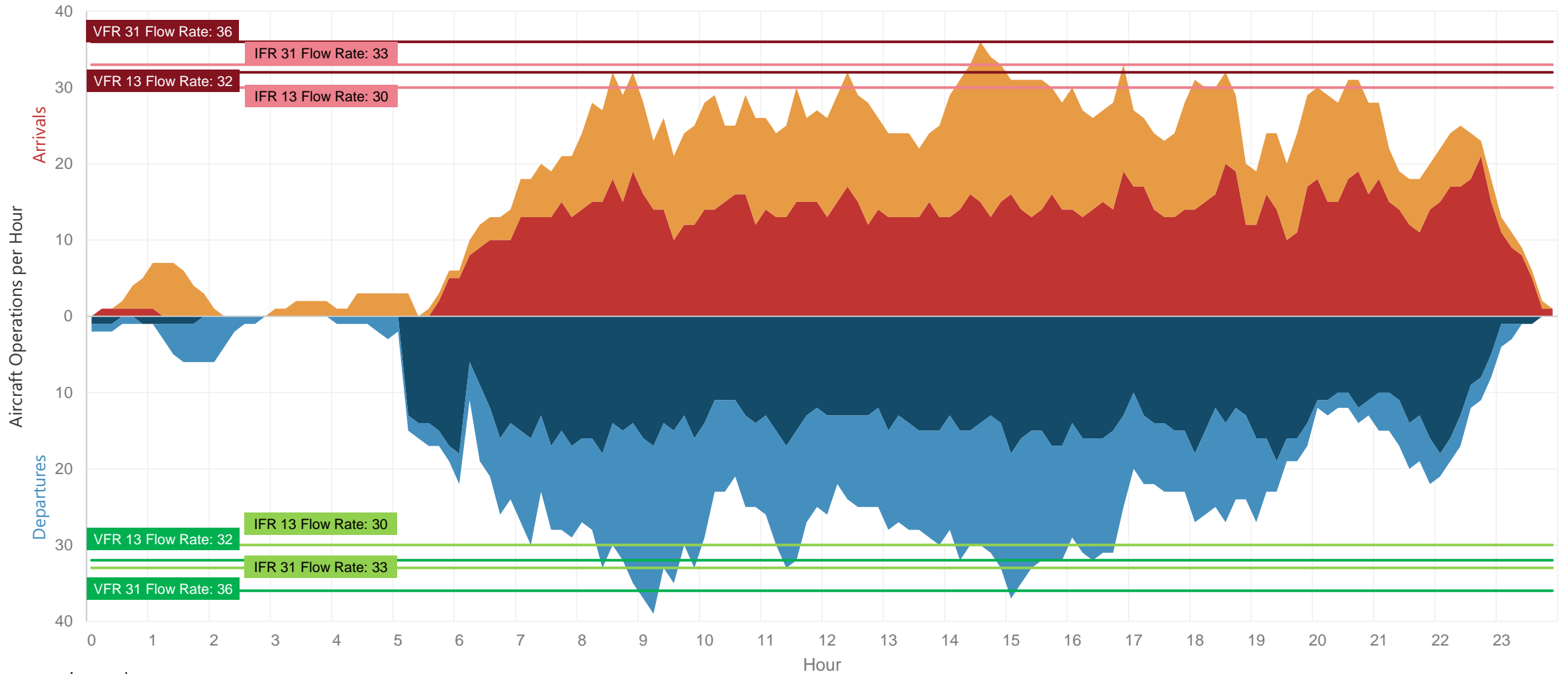
Legend

- Non-Air Carrier Arrivals and Total
- Air Carrier Arrivals
- Air Carrier Departures
- Non-Air Carrier Departures and Total

PAL 1 Demand and FAA Declared Rates



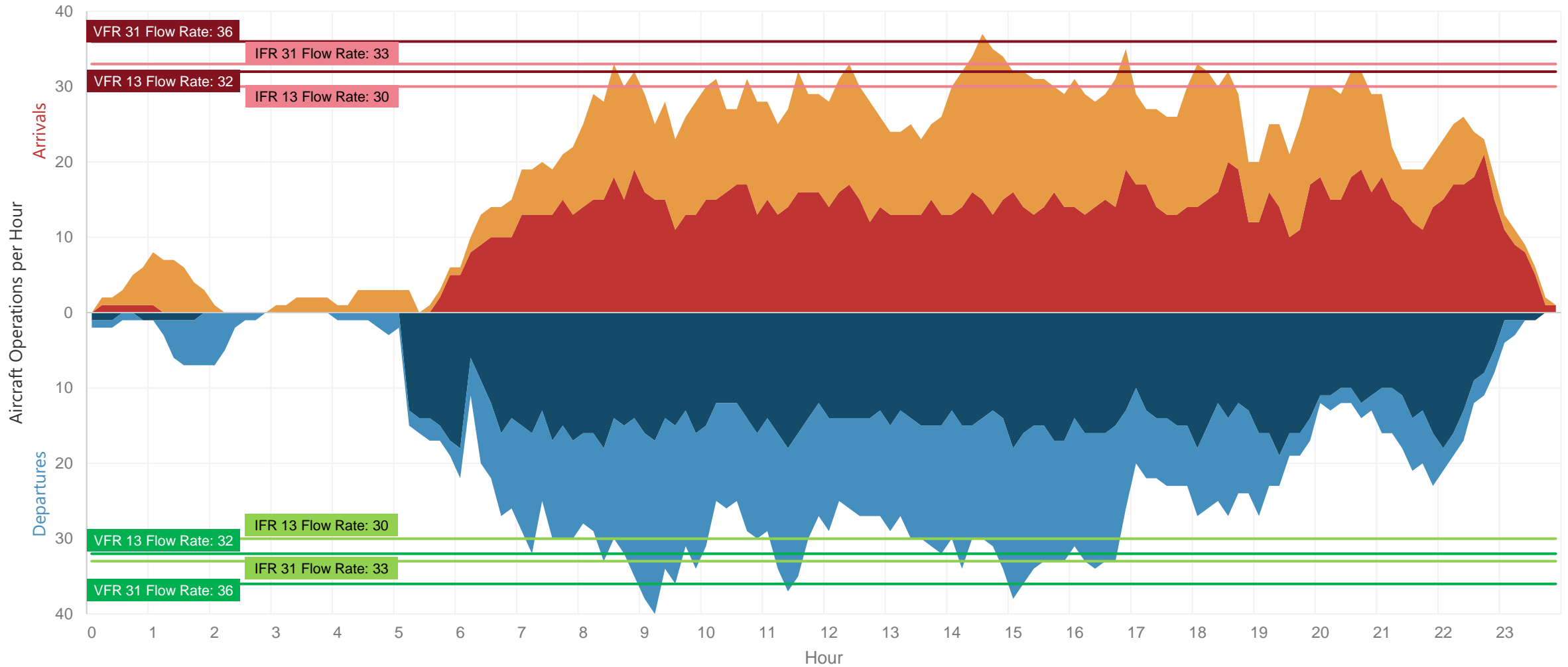
PAL 2 Demand and FAA Declared Rates



Legend

- Non-Air Carrier Arrivals and Total
- Air Carrier Arrivals
- Air Carrier Departures
- Non-Air Carrier Departures and Total

PAL 3 Demand and FAA Declared Rates



Legend

- Non-Air Carrier Arrivals and Total
- Air Carrier Arrivals
- Air Carrier Departures
- Non-Air Carrier Departures and Total

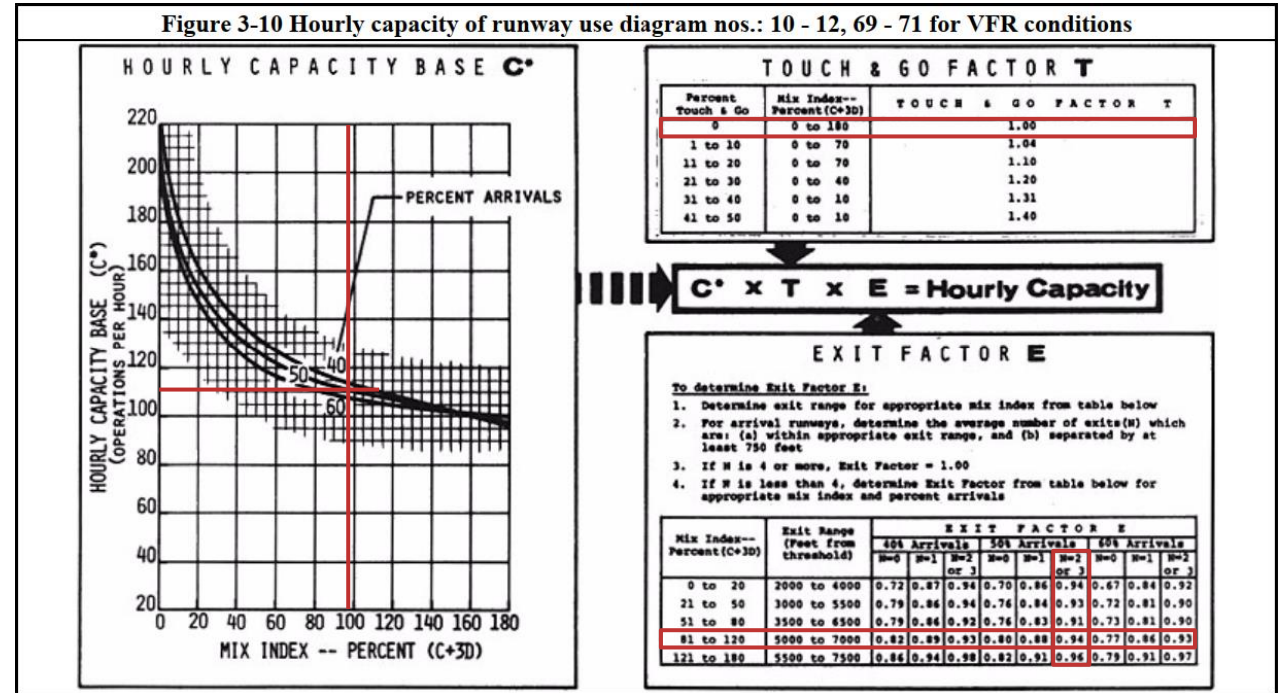
Hourly Capacity Calculation

FAA Advisory Circular 150/5060-5 – *Airport Capacity and Delay* was used to determine the airport hourly capacity

- Figure 3-10 used for VFR

Assumes:

- 50% arrivals during Peak Hour
- No Touch-and-Go activity
- 2 or 3 available exits



C*	T	E	Hourly Capacity
111	x 1.0	x 0.94	= 104

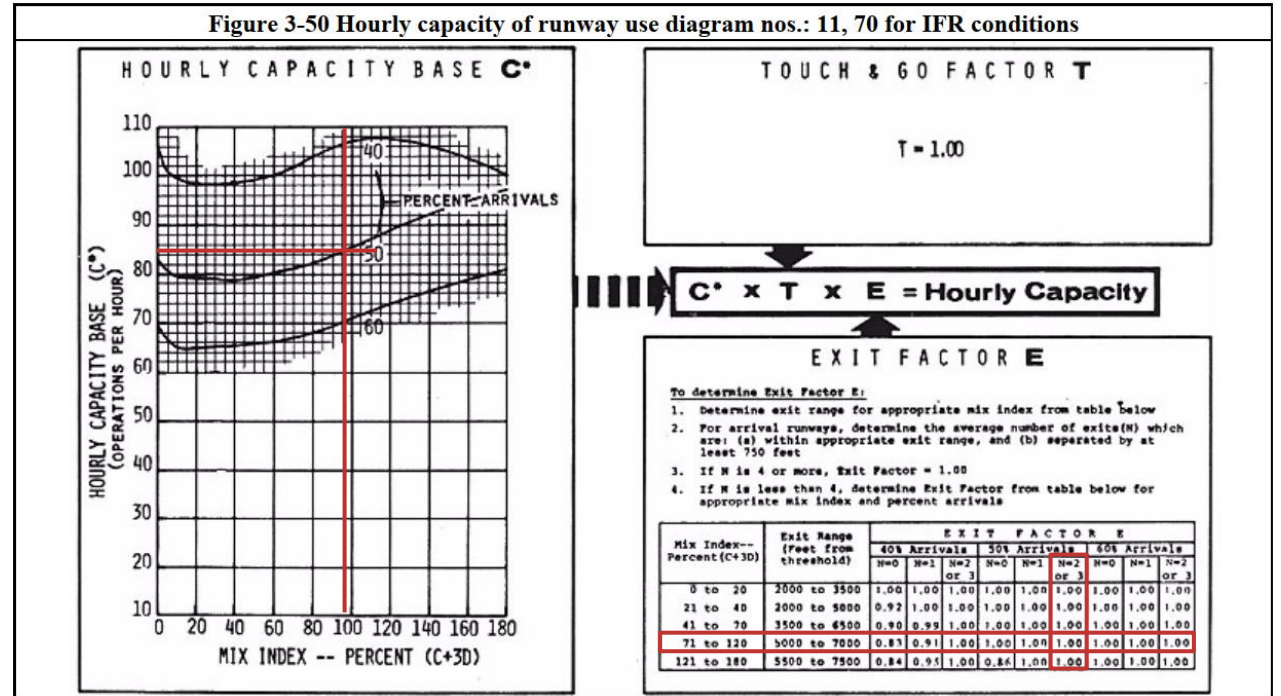
Hourly Capacity Calculation

FAA Advisory Circular 150/5060-5 – *Airport Capacity and Delay* was used to determine the airport hourly capacity

- Figure 3-50 used for IFR

Assumes:

- 50% arrivals during Peak Hour
- No Touch-and-Go activity
- 2 or 3 available exits



C*	T	E	Hourly Capacity
85	x 1.0	x 1.0	= 85

Annual Service Volume Calculation

FAA Advisory Circular 150/5060-5 – *Airport Capacity and Delay* was used to determine the airport capacity

- Operating configurations identified from ASPM use analysis
- Assumes calculated hourly capacity
- Weighting Factor 15 for IFR configurations
- Annual, daily, and peak hour operations from draft forecast

Diagram Number	Operating Configuration	Mix Index	Percent of Year (P)	Hourly Capacity (C)	Percent Maximum Capacity	Weighting Factor (W)
11	VFR Runway 13	95%	58.3%	104	100%	1
11	VFR Runway 31	95%	25.0%	104	100%	1
11	IFR Runway 13	95%	9.9%	85	92%	15
11	IFR Runway 31	95%	6.8%	85	92%	15

	PAL 0	PAL 1	PAL 2	PAL 3
Weighted Hourly Capacity (C _w)	90	90	90	90
Annual Operations	247,510	270,005	275,255	283,460
Average Daily Ops (Peak Month)	873	887	907	947
Average Peak Hour Ops (Peak Month)	65	66	68	70
D=	283.52	304.40	303.48	299.32
H=	13.43	13.44	13.34	13.53
ASV = C _w x D x H	343,000	369,000	365,000	365,000
Percent ASV	72%	73%	75%	78%

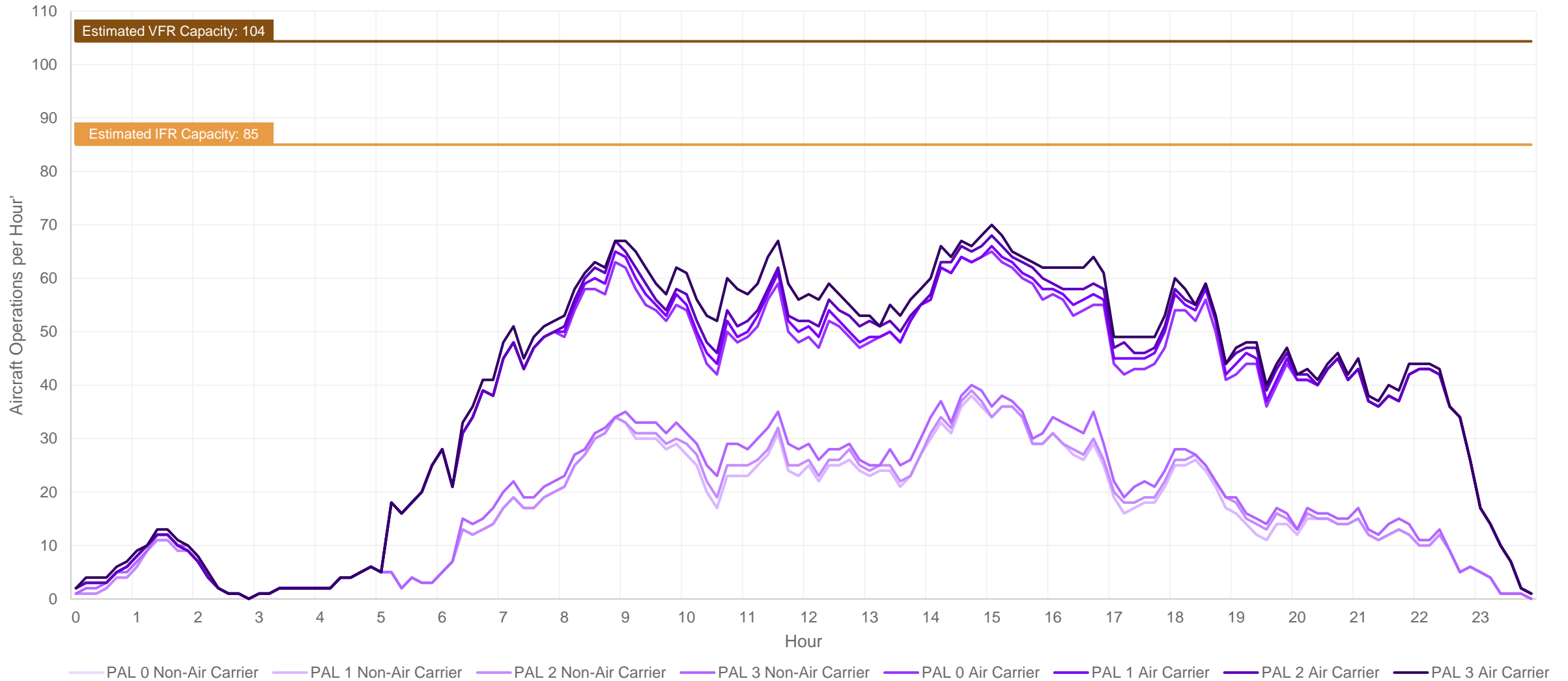
Notes:

$$C_w = \frac{(P_1 \times C_1 \times W_1) + \dots + (P_n \times C_n \times W_n)}{(P_1 \times W_1) + (P_n \times W_n)}$$

$$D = \frac{\text{Annual Operations}}{\text{Average Daily Operations during Peak Month}}$$

$$H = \frac{\text{Average Daily Operations during Peak Month}}{\text{Average Peak Hour Operations during Peak Month}}$$

Design Day Hourly Runway Demand/Capacity



Runway Demand/Capacity Analysis Conclusions

- Demand and capacity ratios can be calculated on an hourly, daily, and/or annual basis. Levels of congestion and delay increase exponentially as demand approaches and exceeds capacity. More delay accumulates when peak demand exceeds capacity by excessive amounts and/or when demand exceeds capacity for extended periods of time.
- FAA declared rates (60-72 operations per hour) are lower than estimated theoretical runway capacity (85-104 operations per hour).
- Design day peak period demand is not anticipated to exceed estimated capacity by extended amounts or for extended periods of time through the planning horizon.
 - Non-air carrier demand represents more than 50 percent of demand during some peak periods.
- Analysis of the annual demand and capacity ratio would justify the evaluation of options for increasing runway capacity and/or managing/limiting demand if/when levels of congestion and delay become problematic.