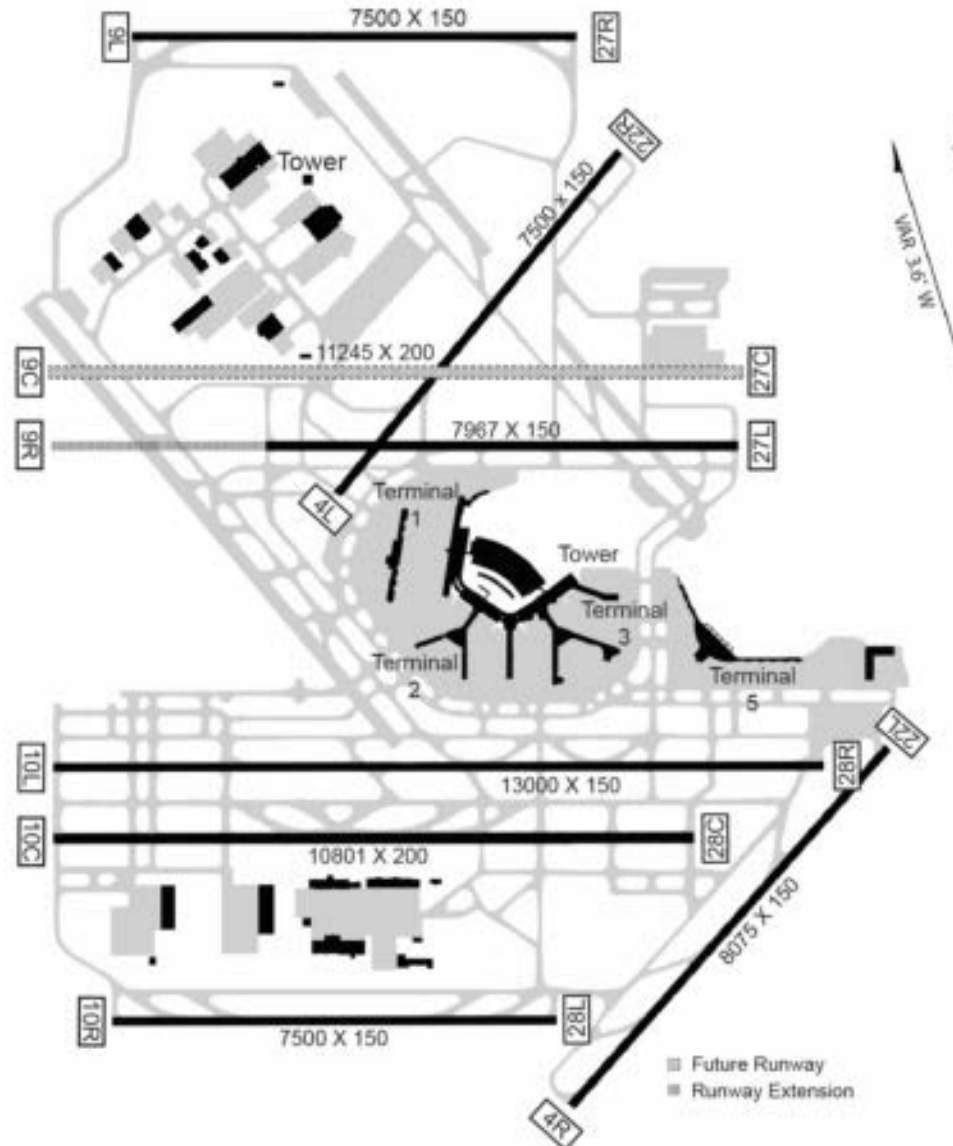


## Airport Capacity Profile: Chicago O'Hare International Airport



*Airport capacity profile estimates were created using a standard set of performance characteristics and do not take into account non-runway constraints, unless otherwise noted. The capacity estimates developed for this report are not intended to replace the results of any detailed analysis that would precede an environmental, investment, or policy decision.*

*The list of Future Improvements and their expected effects on capacity does not imply FAA commitment to, or approval of, any item on the list.*

# Chicago O'Hare International Airport Overview

## About this Airport Capacity Profile

- The capacity profile shows the hourly throughput that an airport is able to sustain during periods of high demand, represented as the range between the model-estimated capacity and the ATC facility-reported rate (called rate). Each weather condition has a unique capacity rate range.
- For each weather scenario, capacity estimates are based on information provided by ATC, including reported arrival and departure rates.

## Recent Capacity Improvements at ORD

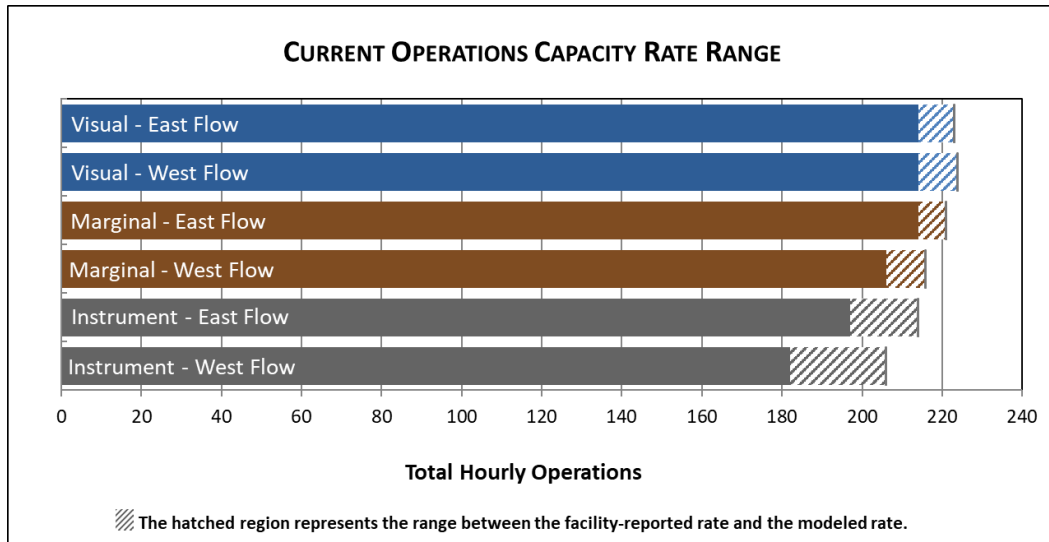
- *Time-Based Flow Management (TBFM)* helps to improve the flow of arrivals to the runways.
- *Wake Recategorization Phase 1* assigns aircraft to new wake turbulence classifications based on their wake turbulence characteristics, such as wake generation, wake decay, and encounter effects. This results in closer longitudinal separation for certain aircraft types without sacrificing safety.
- *A new parallel runway 10C/28C* was commissioned in 2013 which is used primarily for arrivals. The runway is 10,801 x 200 feet and is designed to accommodate Aircraft Design Group VI.
- *A new parallel runway 10R/28L* was commissioned in 2015 which is used primarily for arrivals in East Flow. The runway is 7,500 x 150 feet, and is designed to accommodate Aircraft Design Group V.
- Though not a capacity improvement, runway 15/33 (formerly 14R/32L) was decommissioned in 2018.

## Future Improvements at ORD

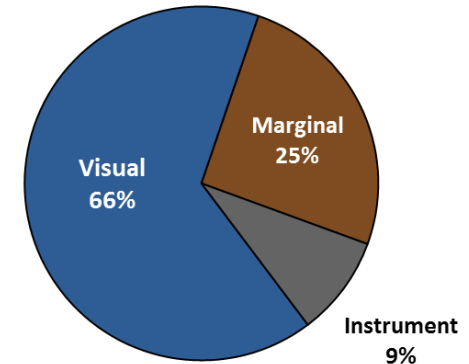
- *Improved Runway Delivery Accuracy:* The combined effects of several new capabilities, including Automatic Dependent Surveillance-Broadcast (ADS-B) Out, Cockpit Display of Traffic Information (CDTI), and Terminal Sequencing and Spacing (TSAS) in the terminal area, will improve the ability of controllers to deliver aircraft to the runway with the desired separation from the preceding aircraft. This will reduce the average spacing between arrivals and boost arrival capacity.
- *Wake Recategorization Phase 2* assigns aircraft to new wake turbulence classifications based on their wake turbulence characteristics, such as wake generation, wake decay, and encounter effects. This results in closer longitudinal separation for certain aircraft types without sacrificing safety.
- *New Runways and Extensions:* The O'Hare Modernization Program (OMP) calls for a series of new runways and extensions. The completion of OMP includes: (1) extending existing runway 9R/27L westward to bring the runway length to 11,260 feet from 7,967 feet, and (2) opening a new closely spaced parallel runway 9C/27C on the North Airfield that is 11,245 x 200 feet. The model-estimated rates in this profile assume that ground infrastructure, environmental constraints, and other operational factors allow for the planned use of the runways.

# Chicago O'Hare International Airport Overview - 2

## Current Operations Capacity Rate Range



## Annual Weather Conditions



### Visual Conditions:

- Ceiling and visibility allow for visual approaches: at least 5500 feet ceiling and 7 miles visibility

### Marginal Conditions:

- Ceiling and visibility below visual approach minima but better than Instrument conditions

### Instrument Conditions:

- Ceiling and visibility below 1000 feet ceiling or 3 miles visibility

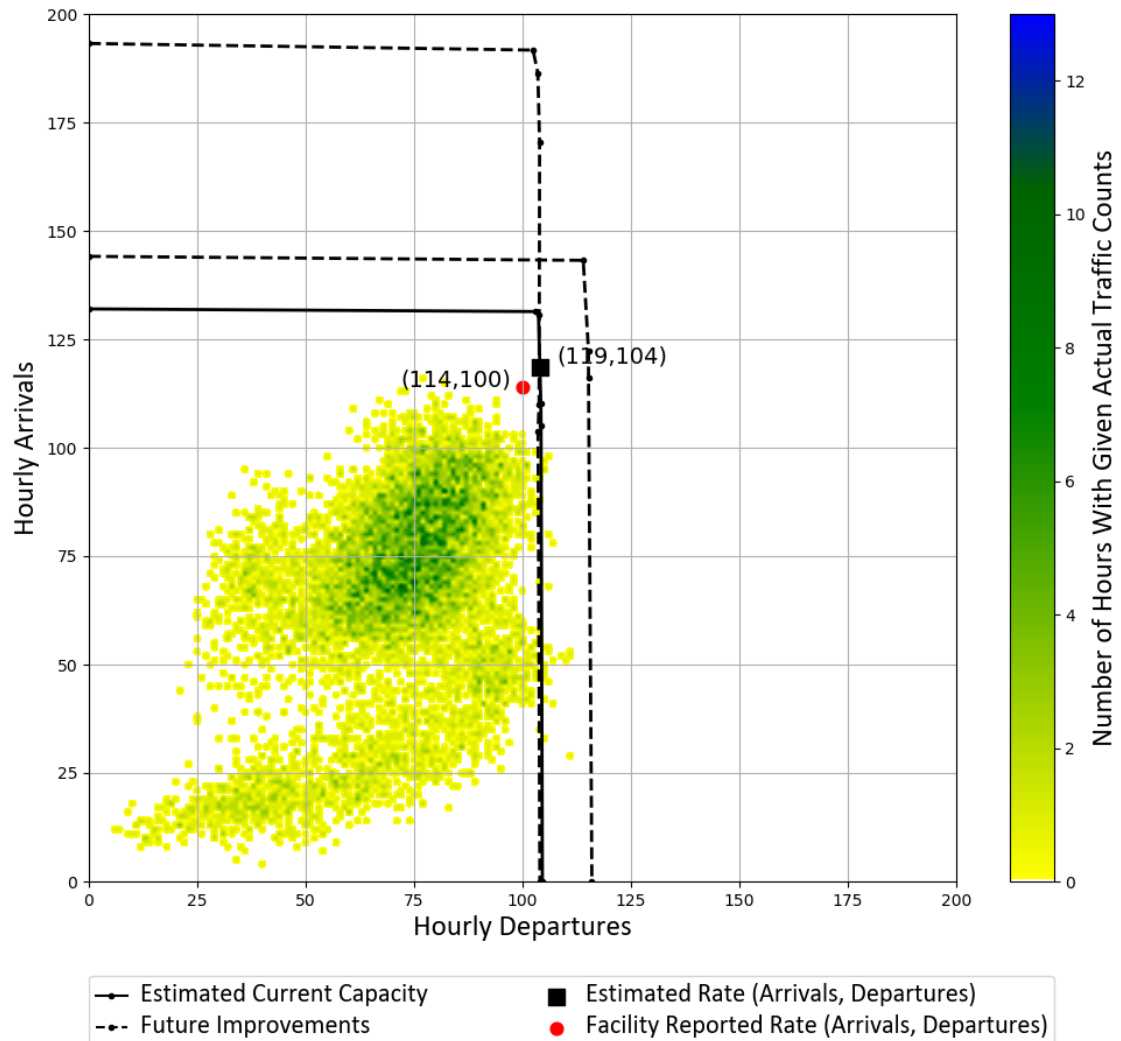
## Data Sources

- Throughout the profile, actual hourly ORD operations, weather and configuration data were obtained from the FAA ASPM database, and represent operational hours from 7am to 11pm local time for October 15 2015 through September 30 2017. Actual configuration usage is determined by multiple operational factors, including weather conditions.
- Facility-reported rates were provided by ATC personnel at ORD.
- Model-estimated rates are derived from operational information provided by ATC.

Type Operations		Arrival Runways	Departure Runways	Hourly Rate	
				ATC Facility-Reported	Model-Estimated
Current Operations		09L, 10C, 10R	09R, 10L	214	223
New Runways and Future Improvements	Balanced Priority	09C, 09L, 10C	09R, 10L, 22L	N/A	246
	Quad Arrivals	09C, 09L, 10C, 10R	09R, 10L	N/A	292

- **New Runways:** Extension to 09R/27L and New Runway 09C/27C
- **Future Improvements:** Improved Runway Delivery Accuracy, Wake Recategorization Phase 2
- The capacity rate range in Visual conditions in East Flow is currently 214 - 223 operations per hour.
- Heavy aircraft operations are most frequent on Runways 10C and 10L.
- Limited departure fanning is conducted from Runway 22L, when available. All other times, limited departure fanning is conducted from Runway 10L.
- Quad Arrivals would temporarily increase arrival capacity by 49 operations per hour, but corresponding departure capacity would decrease by 11 operations per hour.
- Departures from 22L do not occur when 10R is available for arrivals. Additionally, the separations required between 10L and 22L departures is a capacity limitation.
- The Future Balanced Priority configuration does not produce enough departure capacity to offset the service imbalance that Quad Arrivals might produce. The temporary use of three dedicated parallel departure runways could further increase departure capacity, but is unlikely to be a common operational configuration.

### Visual Weather Conditions

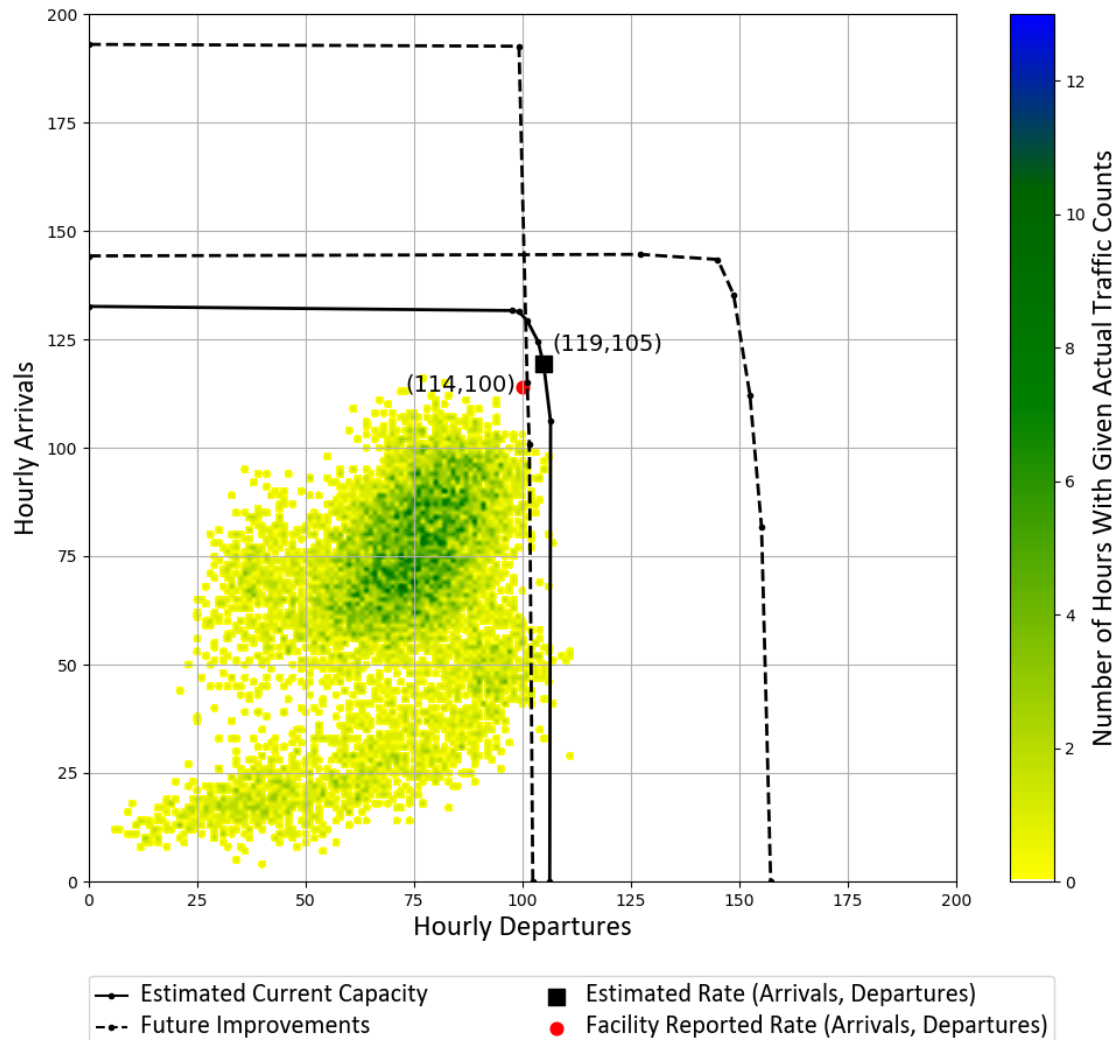


Actual traffic counts shown are for all Visual hours, all configurations.  
For data source information, see page 3.

Type Operations		Arrival Runways	Departure Runways	Hourly Rate	
				ATC Facility-Reported	Model-Estimated
Current Operations		27L, 27R, 28C	22L, 28R	214	224
New Runways and Future Improvements	Balanced Priority	27C, 27R, 28C	22L, 27L, 28R	N/A	288
	Quad Arrivals	27C, 27R, 28C, 28L	27L, 28R	N/A	292

- **New Runways:** Extension to 09R/27L and New Runway 09C/27C
- **Future Improvements:** Improved Runway Delivery Accuracy, Wake Recategorization Phase 2
- The capacity rate range in Visual conditions in West Flow is currently 214 - 224 operations per hour.
- Limited departure fanning is conducted from Runway 22L, when available. For Quad Arrivals, limited departure fanning is conducted from Runway 28R.
- Heavy aircraft operations are most frequent on Runways 28C and 28R.
- Quad Arrivals would temporarily increase arrival capacity by 48 operations per hour, but corresponding departure capacity would decrease by 44 operations per hour.

### Visual Weather Conditions



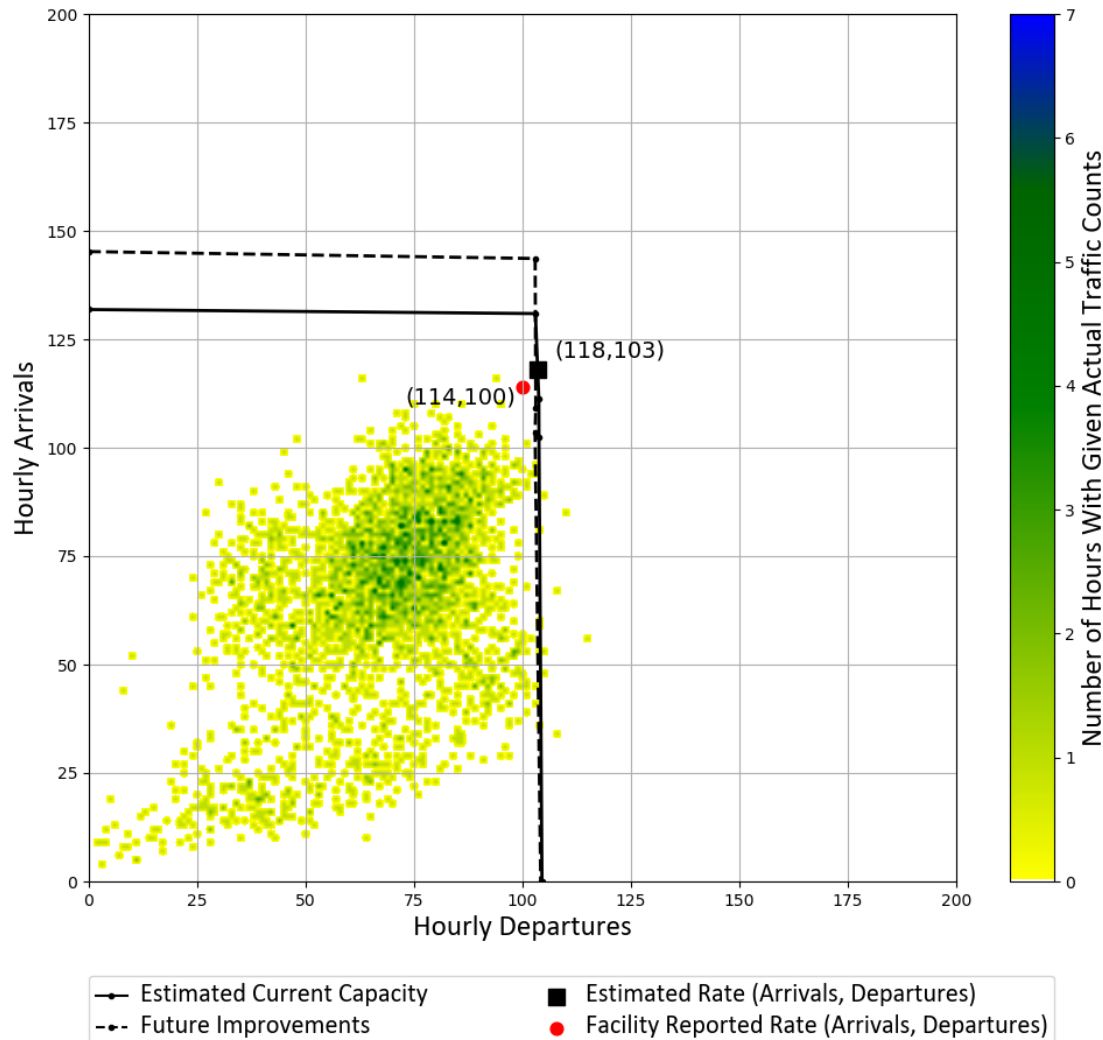
Actual traffic counts shown are for all Visual hours, all configurations.  
For data source information, see page 3.

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility-Reported	Model-Estimated
<b>Current Operations</b>	09L, 10C, 10R	09R, 10L	214	221
<b>New Runways and Future Improvements</b>	09C, 09L, 10C	09R, 10L	N/A	221

- **New Runways:** Extension to 09R/27L and New Runway 09C/27C
- **Future improvements:** Improved Runway Delivery Accuracy, Wake Recategorization Phase 2
- The capacity rate range in Marginal conditions in East Flow is currently 214 – 221 operations per hour.
- Reduced separation (2.5 NM) between arrivals is authorized for instrument approaches to all arrival runways.
- Heavy aircraft operations are most frequent on Runways 10C and 10L.



### Marginal Weather Conditions

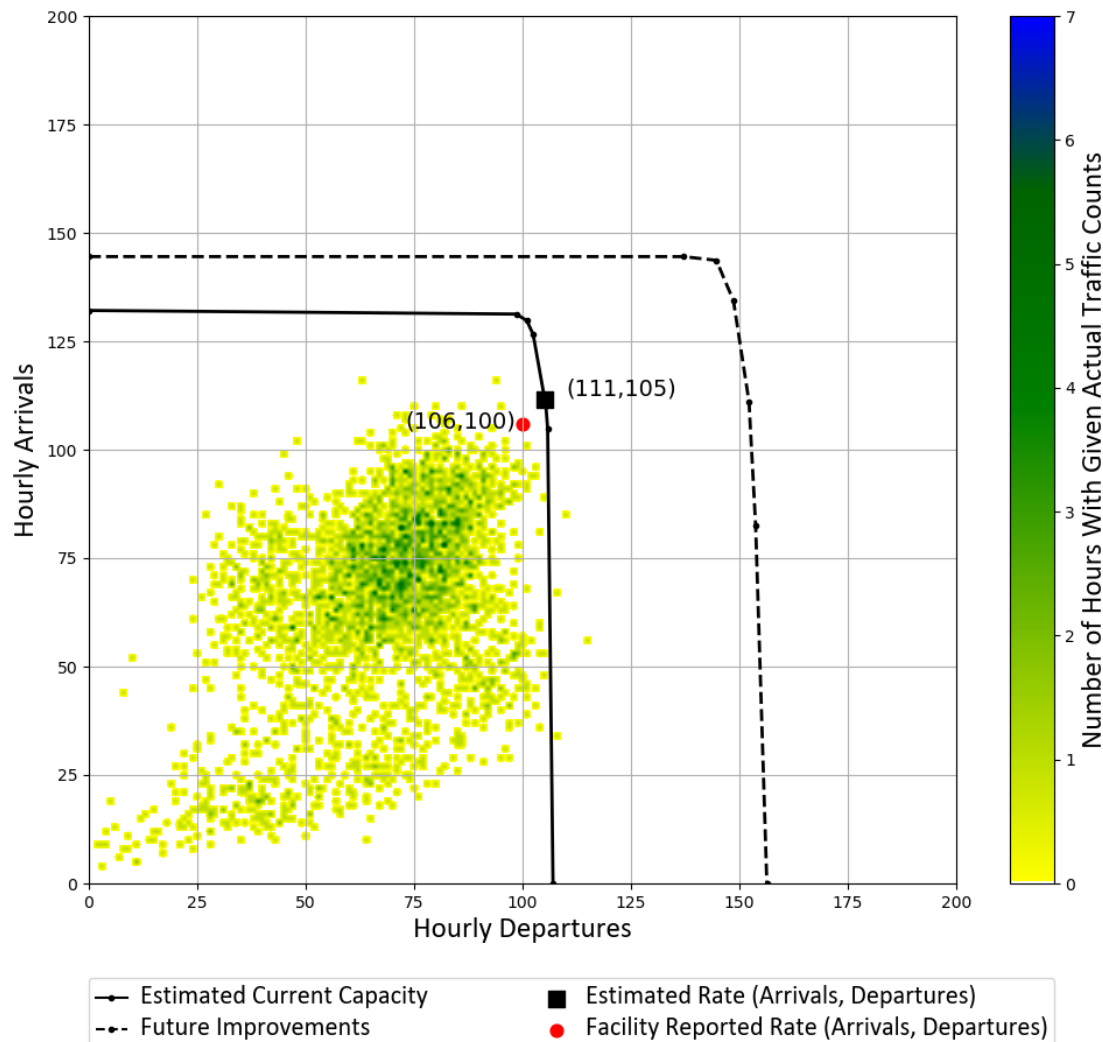


Actual traffic counts shown are for all Marginal hours, all configurations.  
For data source information, see page 3.

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility-Reported	Model-Estimated
Current Operations	27L, 27R, 28C	22L, 28R	206	216
New Runways and Future Improvements	27C, 27R, 28C	22L, 27L, 28R	N/A	288

- **New Runways:** Extension to 09R/27L and New Runway 09C/27C
- **Future Improvements:** Improved Runway Delivery Accuracy, Wake Recategorization Phase 2
- The capacity rate range in Marginal conditions in West Flow is currently 206 - 216 operations per hour.
- Reduced separation (2.5 NM) between arrivals is authorized for instrument approaches to all arrival runways.
- Limited departure fanning is conducted from Runway 22L, when available.
- Heavy aircraft operations are most frequent on Runways 28C and 28R.

### Marginal Weather Conditions

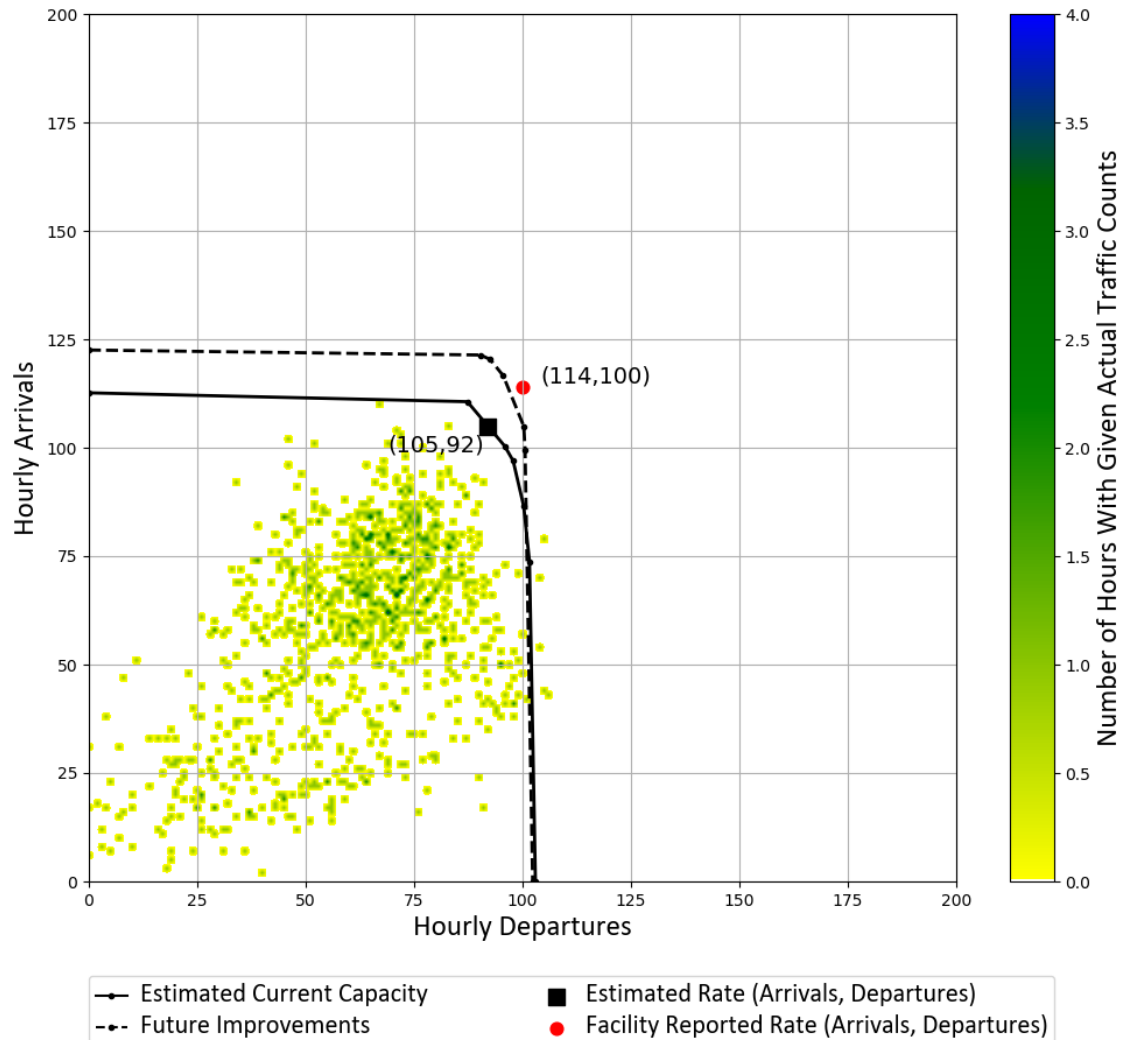


Actual traffic counts shown are for all Marginal hours, all configurations.  
For data source information, see page 3.

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility-Reported	Model-Estimated
<b>Current Operations</b>	09L, 10C, 10R	09R, 10L	214	197
<b>New Runways and Future Improvements</b>	09C, 09L, 10C	09R, 10L	N/A	209

- **New Runways:** Extension to 09R/27L and New Runway 09C/27C
- **Future improvements:** Improved Runway Delivery Accuracy, Wake Recategorization Phase 2
- The capacity rate range in Instrument conditions in East Flow is currently 197 – 214 operations per hour.
- Reduced separation (2.5 NM) between arrivals is authorized for instrument approaches to all arrival runways.
- Heavy aircraft operations are most frequent on Runways 10C and 10L.

### Instrument Weather Conditions

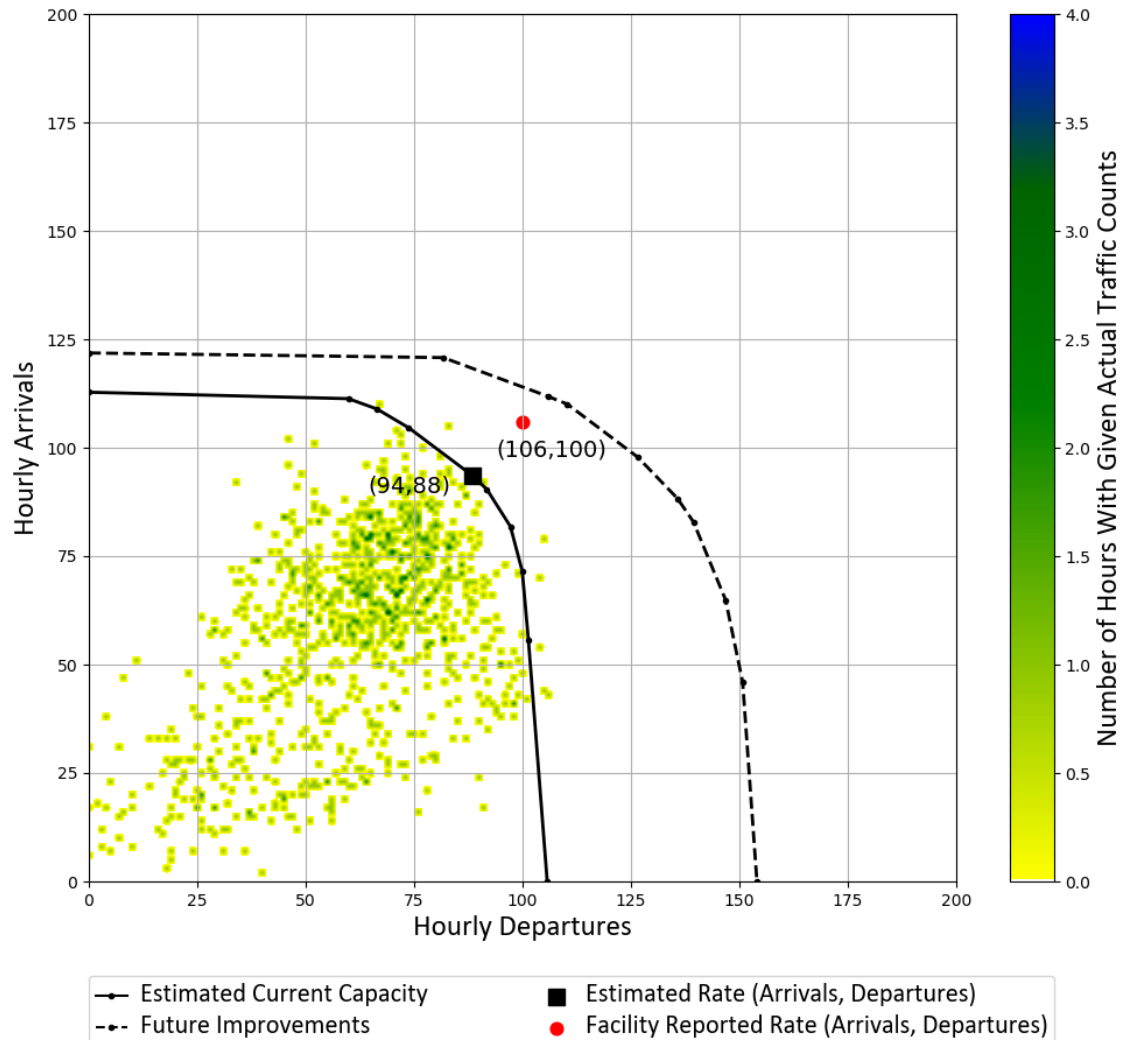


Actual traffic counts shown are for all Instrument hours, all configurations.  
For data source information, see page 3.

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility-Reported	Model-Estimated
<b>Current Operations</b>	27L, 27R, 28C	22L, 28R	206	182
<b>New Runways and Future Improvements</b>	27C, 27R, 28C	22L, 27L, 28R	N/A	220

- **New Runways:** Extension to 09R/27L and New Runway 09C/27C
- **Future improvements:** Improved Runway Delivery Accuracy, Wake Recategorization Phase 2
- The capacity rate range in Instrument conditions in West Flow is currently 182 - 206 operations per hour.
- Reduced separation (2.5 NM) between arrivals is authorized for instrument approaches to all arrival runways.
- Limited departure fanning is conducted from Runway 22L, when available.
- Heavy aircraft operations are most frequent on Runways 28C and 28R.

## Instrument Weather Conditions



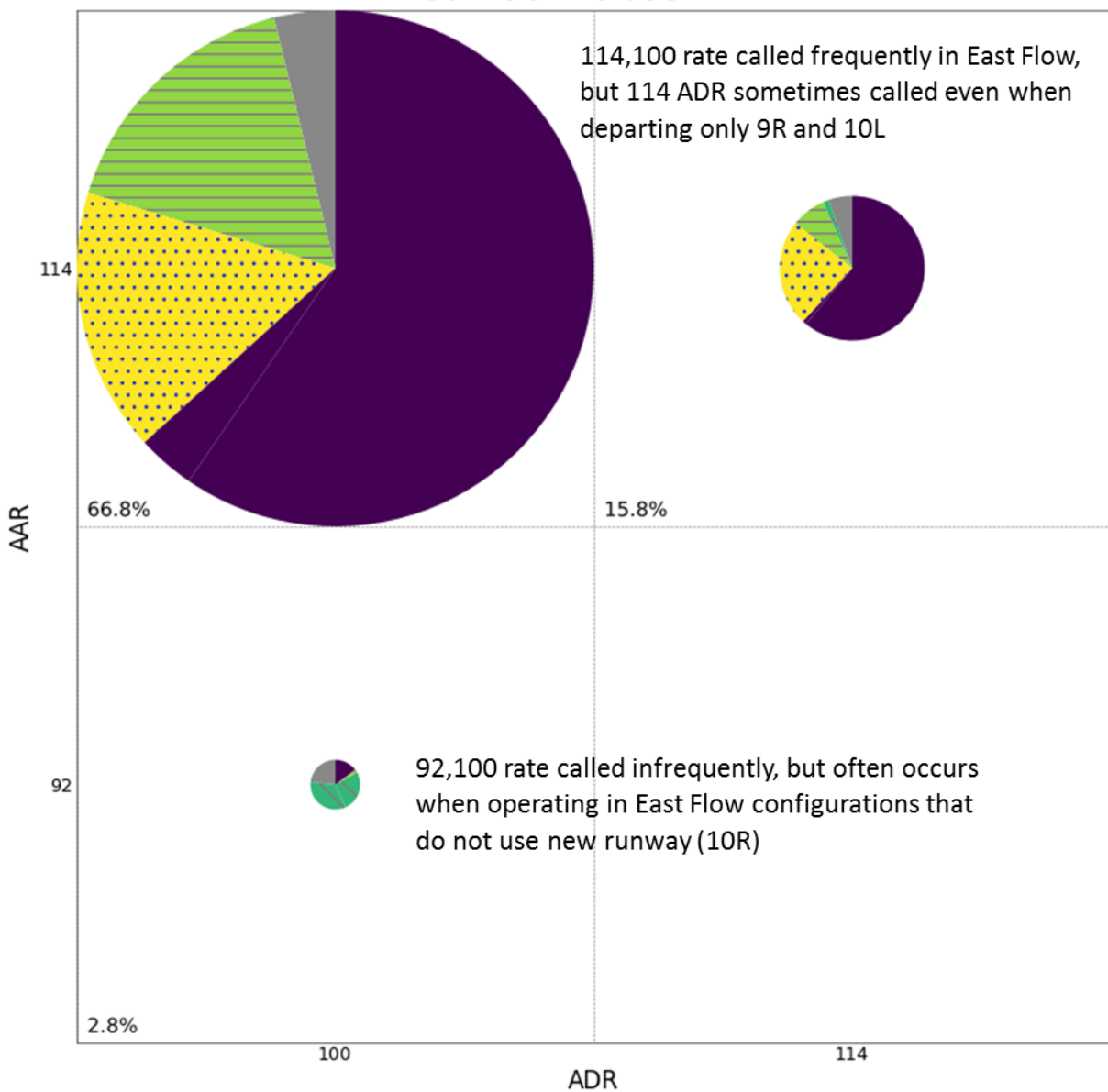
Actual traffic counts shown are for all Instrument hours, all configurations.  
For data source information, see page 3.

# Historical Called Rate and Configuration Usage by Flow



# HISTORICAL USAGE – EAST FLOW

## Called Rates



Other rates: 14.6%

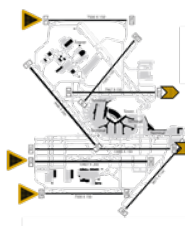
Rates for all hours regardless of configuration, minimum 2% of time

EAST FLOW FACILITY REPORTED RATES		
114,100 (VMC)	114,100 (MMC)	114,100 (IMC)

All data for hours from 15 Oct 2015 – 30 Sep 2017, 7 AM to 11 PM. Excludes variable winds and missing or incomplete data. Only shows rates called at least 2% of all hours.

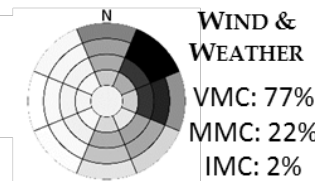
## Configuration Usage

### 9L,10C,10R | 9R,10L (16%)

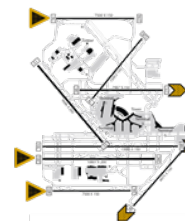


RATES

114,100 (69%)
114,114 (24%)

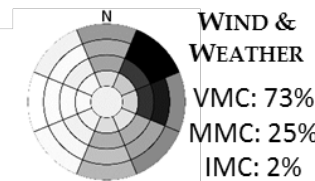


### 9L,10C,10R | 9R,10L,22L (14%)



RATES

114,100 (80%)
114,114 (9%)
112,100 (8%)



### Other East Flow > 2%

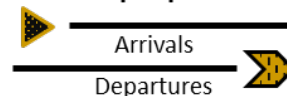
- 9L,9R,10C | 9R,10L
- 9L,9R,10C | 9R,10L,22L

### West Flow Configurations

### Other Configurations

## Key

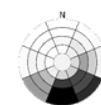
Arrivals | Departures (percent of time in configuration)



### RATES

90,90 (90%) Rates (AAR, ADR) called at least 5% of time when configuration used

### WIND & WEATHER



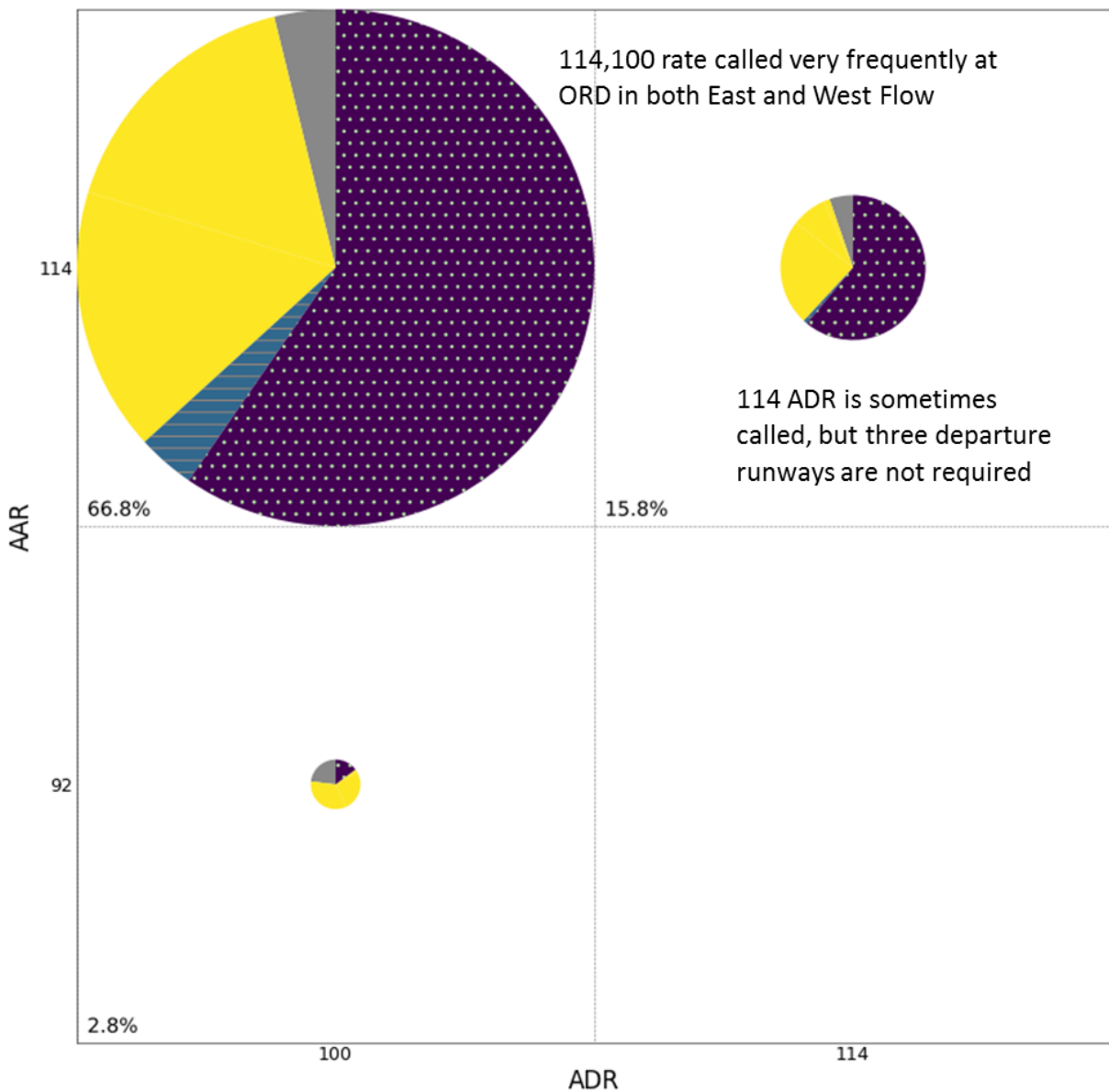
Wind speeds increase away from center (3 knot increments)

More common winds are darker

Percent of time spent in VMC/MMC/IMC when configuration used

# HISTORICAL USAGE – WEST FLOW

## Called Rates



Other rates: 14.6%

Rates for all hours regardless of configuration, minimum 2% of time

WEST FLOW FACILITY REPORTED RATES		
114,100 (VMC)	106,100 (MMC)	106,100 (IMC)

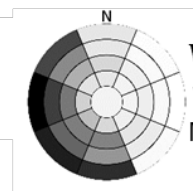
All data for hours from 15 Oct 2015 – 30 Sep 2017, 7 AM to 11 PM. Excludes variable winds and missing or incomplete data. Only shows rates called at least 2% of all hours.

## Configuration Usage

27L,27R,28C|22L,28R (54%)



RATES  
114,100 (74%)  
114,114 (18%)



WIND & WEATHER  
VMC: 71%  
MMC: 23%  
IMC: 6%

Other West Flow > 2%  
• 27L,27R,28C|22L,28R,33\*

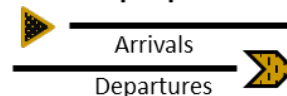
East Flow Configurations

Other Configurations

\*Runway 33 was identified as Runway 32L in data prior to renaming in 2015. Runway 33 was decommissioned in 2018.

### Key

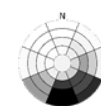
Arrivals | Departures (percent of time in configuration)



RATES

90,90 (90%) Rates (AAR, ADR) called at least 5% of time when configuration used

WIND & WEATHER



Wind speeds increase away from center (3 knot increments)

More common winds are darker

Percent of time spent in VMC/MMC/IMC when configuration used