

# Amended Preferential Runway System Trial Report

February 27, 2020 - February 26, 2021

# Amended Preferential Runway System Trial



## **Duration:**

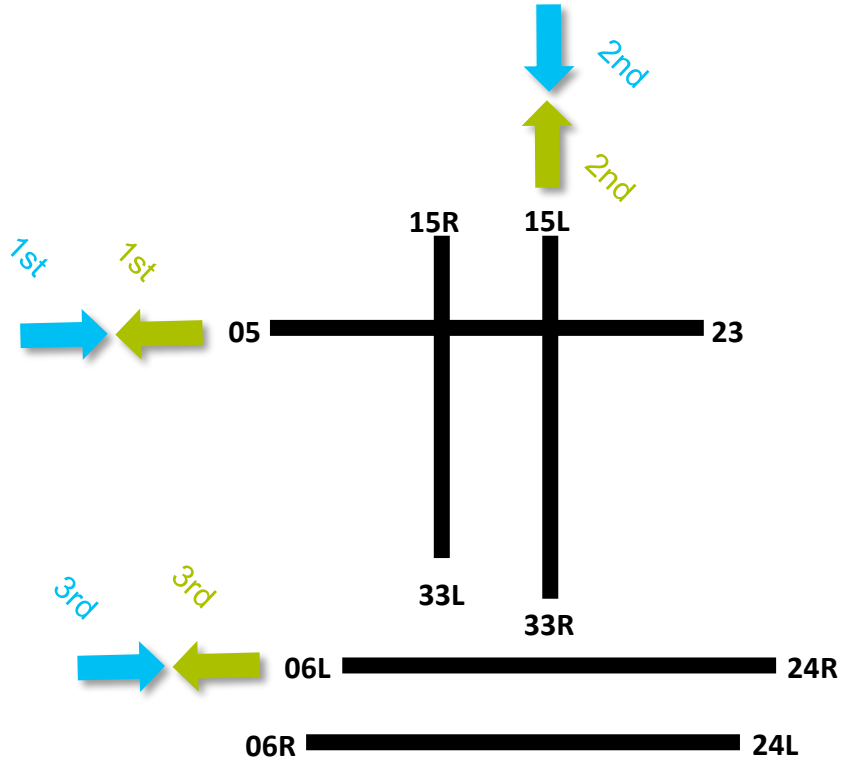
- February 27, 2020 to February 26, 2021, nightly during the preferential runway hours (12:00 a.m. to 6:30 a.m.)
- Trial will last for one year to test usage of the updated system across a variety of weather conditions, as well as during runway construction season and winter operations.

## **Objective:**

- Minimize the total population impacted by aircraft noise of 45 dB or higher during preferential hours.
- Enable more consistent use of runways identified as the preferential runways.
- Provide alternatives for into-the-wind configurations for each direction, which would be used when the crosswinds and/or tailwinds don't allow the use of the first or second choice preferential runway configurations.

*Note: The Preferential Runway System outlines the preferred runways to use. However, non-preferential runways may be used when required by weather, wind, runway availability, or operational requirements, such as runway maintenance.*

# Pre-Trial Preferential Runway System

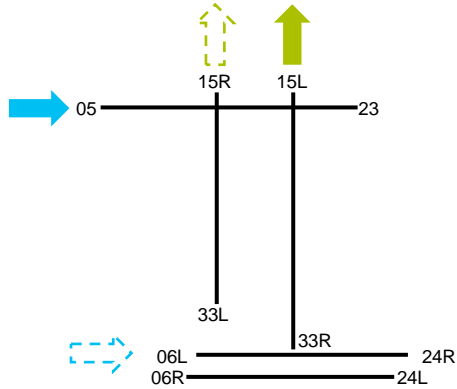


## Disadvantages:

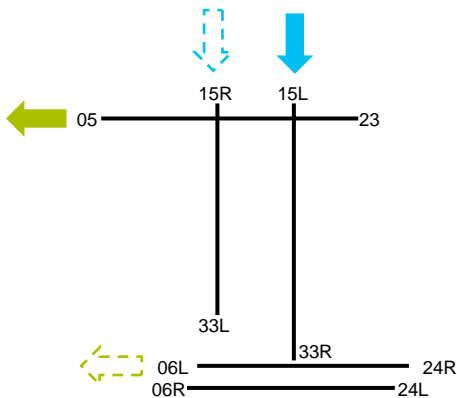
- Very little flexibility – could either use the Arrival preferential runway or the Departure one
- Did not account for winds
- Did not allow for maintenance options

# Amended Preferential Runway System

1<sup>st</sup> Choice - Whenever crosswind, tailwinds & winds-aloft allow

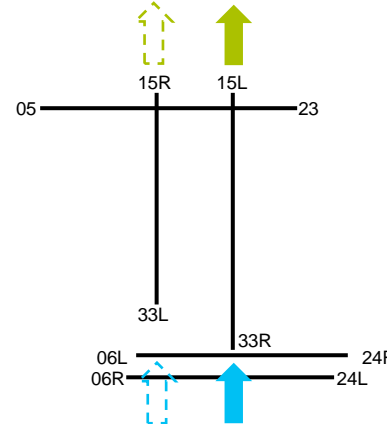


2<sup>nd</sup> Choice - Whenever crosswind, tailwinds & winds-aloft allow

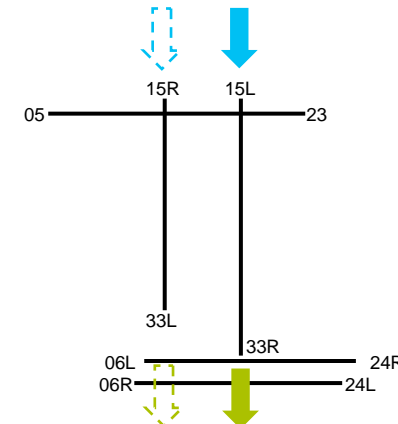


Selection driven by weather conditions and infrastructure availability when 1<sup>st</sup> or 2<sup>nd</sup> choice are not operable. Ultimately any single or pair of runways can be used.

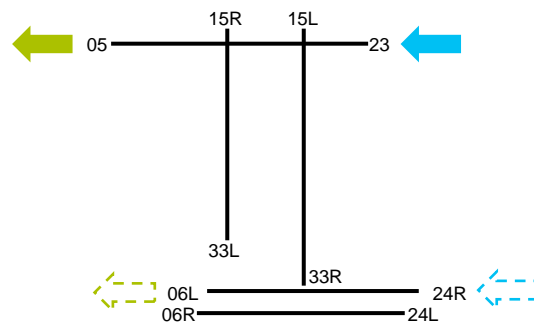
Operation for northerly wind



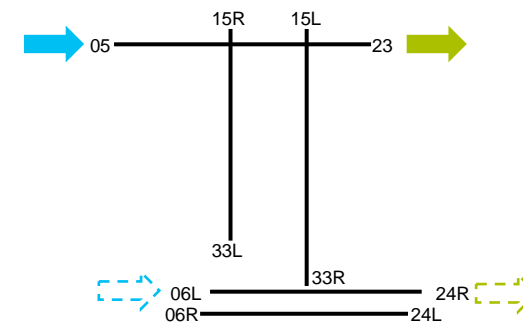
Operation for southerly wind



Operation for westerly wind



Operation for easterly wind



Key:

← Primary departures

← Primary arrivals

↔ Maintenance adjusted departures

↔ Maintenance adjusted arrivals

# Adherence and Non-Adherence Meaning



- Operations that occur on the 1<sup>st</sup> or 2<sup>nd</sup> choice runways, or their maintenance adjusted counterparts, are considered to have adhered to the Preferential Runway System.
- When the 1<sup>st</sup> or 2<sup>nd</sup> choice are not operable, the wind dictated runway(s) or the maintenance adjusted counterpart(s) will be used. These are still part of the Preferential Runway System and are therefore considered as adherent.
- Non-adherent operations can occur when an aircraft arrives or departs off a runway that isn't part of the 1st, 2nd or wind driven runways that are in use at that time. This could happen as a result of:
  - Heavy traffic caused by a weather event earlier in the day requiring the use of additional runways (e.g. due to winds Runway 33R is being used for arrivals and departures, however some arrivals are offloaded onto Runway 33L. These offloads are considered non-adherent).
  - A medevac aircraft requesting the use of a non-preferential runway for safe and expedited patient transport (e.g. departed Runway 23 when the 1<sup>st</sup> choice was being used).
  - The aircraft was assigned a runway before the start of the preferential runway hours but ended up operating after midnight (e.g. aircraft already lined up for departure off Runway 23, cleared to take off even though the airport had just switched to the 1<sup>st</sup> choice configuration).
  - An active runway is temporarily unavailable due to snow clearing or a bird strike (e.g. the 1<sup>st</sup> choice configuration is in use, but during snow clearing on Runway 05, several aircraft arrive on Runway 06L and are considered non-adherent).

- The overall adherence to the Preferential Runway System was 58.3% for the pre-trial period of February 27, 2019 to February 26, 2020 . This has increased to **94.2% for the trial period of February 27, 2020 to February 26, 2021.**
- This increase in adherence and the resultant reliable usage is related to two challenges in the pre-trial system that the amended Preferential Runway System was designed to address:

1. The pre-trial Preferential Runway System, did not account for factors such as wind, weather or runway availability, which necessitated the use of runways that were not identified as preferential, and led to low adherence levels.

The amended system provides Air Traffic Controllers with more flexibility for wind-dictated operations, as well as alternatives during maintenance work, snow clearing, etc.

2. In the pre-trial system, the first-choice runway for departures and the first-choice runway for arrivals cannot be used together for safety reasons. Therefore, if the first-choice runway is used for departures, the second or third choice would have to be used for arrivals and vice versa, to avoid head-on operations.

The amended Preferential Runway System better reflects how the airport operates, and therefore allows for more reliable usage of the system.

# Adherence by Month

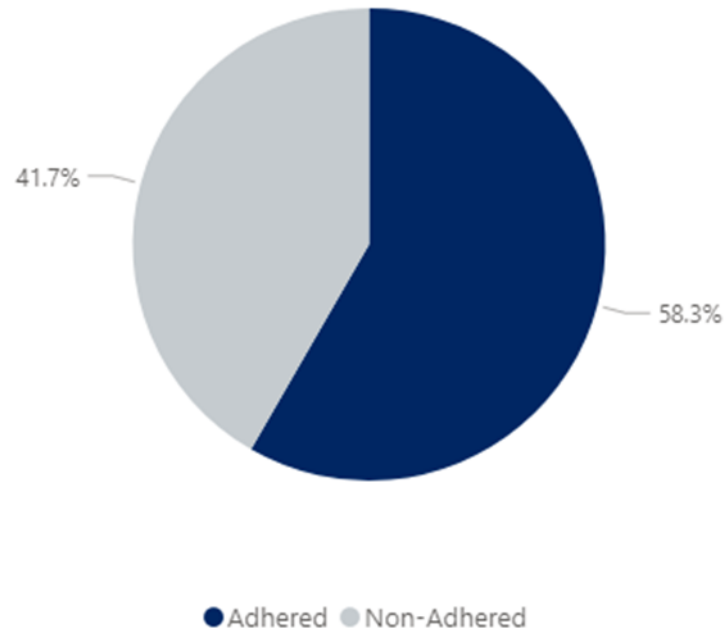


Trial Month	Pre-Trial Adhered	Pre-Trial Non-Adhered	Trial Adhered	Trial Non-Adhered
Month 1 (Feb 27-Mar 31)	47.7%	52.3%	91.6%	8.4%
Month 2 (April 1-30)	60.5%	39.5%	98.4%	1.6%
Month 3 (May 1-31)	56.8%	43.2%	98.2%	1.8%
Month 4 (June 1-30)	52.1%	47.9%	98.0%	2.0%
Month 5 (July 1-31)	70.0%	30.0%	81.7%	18.3%
Month 6 (August 1-31)	67.1%	32.9%	97.2%	2.8%
Month 7 (September 1-30)	66.0%	34.0%	98.2%	1.8%
Month 8 (October 1-31)	59.1%	40.9%	98.3%	1.7%
Month 9 (November 1-30)	54.5%	45.5%	92.1%	7.9%
Month 10 (December 1-31)	55.9%	44.1%	93.2%	6.8%
Month 11 (January 1-31)	57.2%	42.8%	95.5%	4.5%
Month 12 (February 1-26)	53.7%	46.3%	96.1%	3.9%

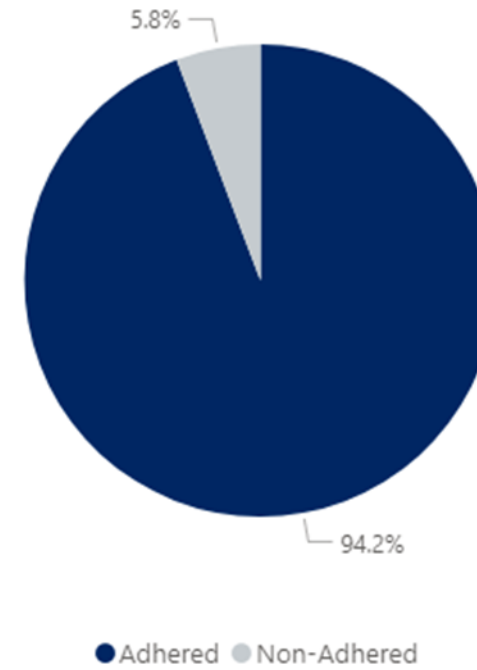
*Note: The lower adherence in July was related to capital construction work.*

# Adherence – All Movements

Pre-Trial Adherence - All Movements



Trial Adherence - All Movements

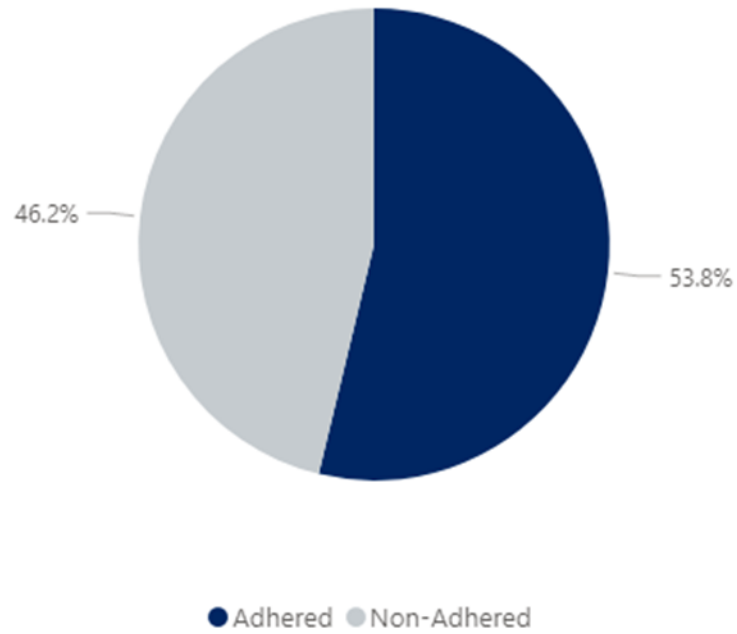




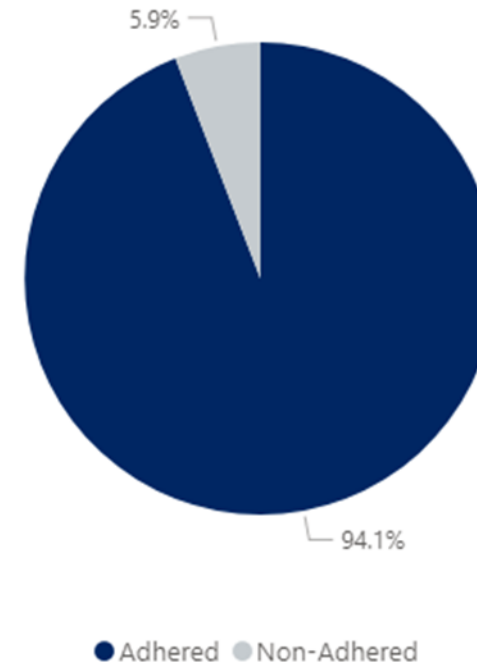
# Adherence – Arrivals



Pre-Trial Adherence - Arrivals



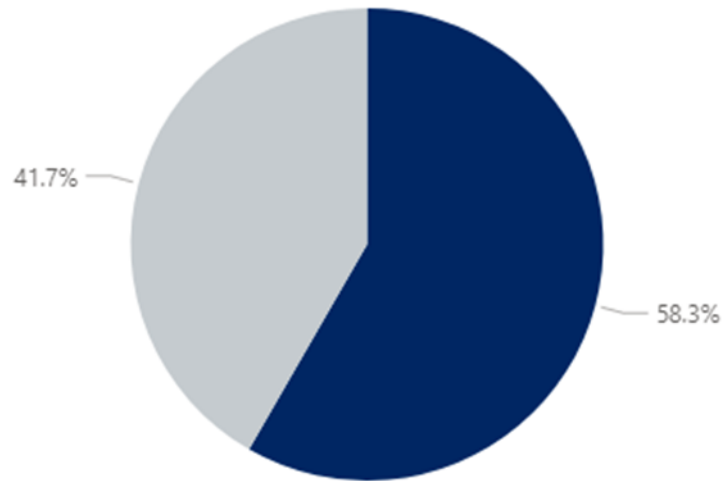
Trial Adherence - Arrivals



# Adherence – Departures

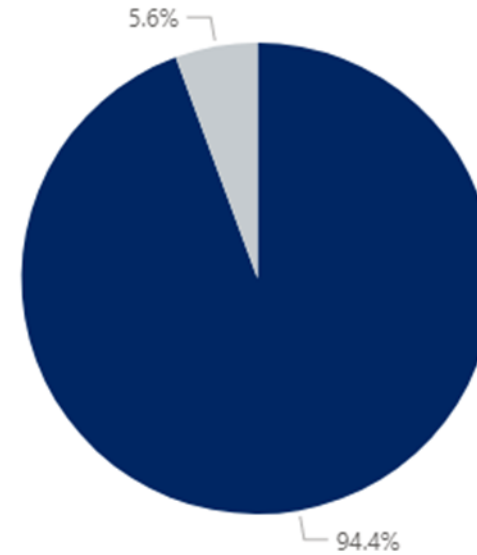


Pre-Trial Adherence - Departures



● Adhered ● Non-Adhered

Trial Adherence - Departures

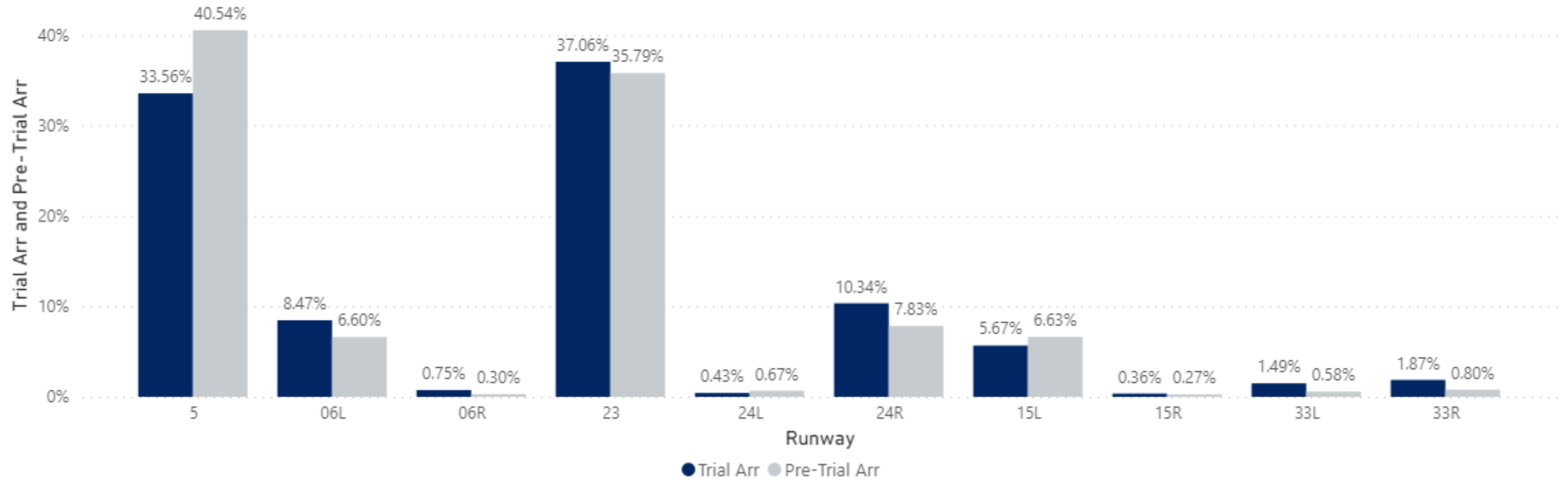


● Adhered ● Non-Adhered

# Runway Usage – Arrivals



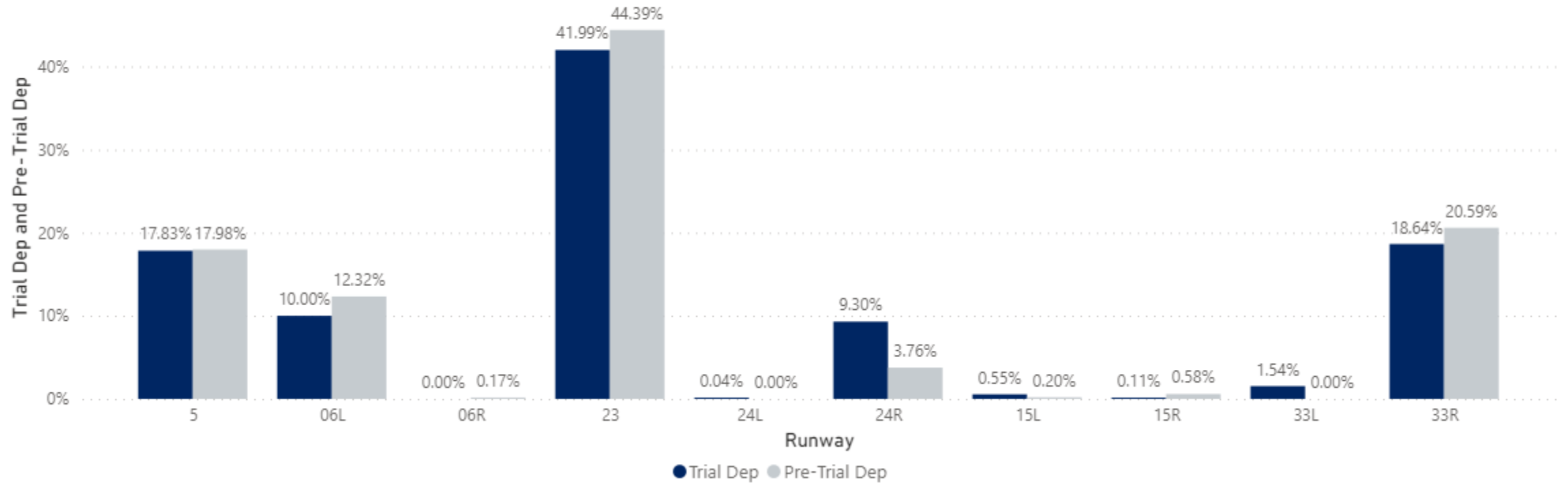
Arrivals by Runway



# Runway Usage – Departures



Departures by Runway

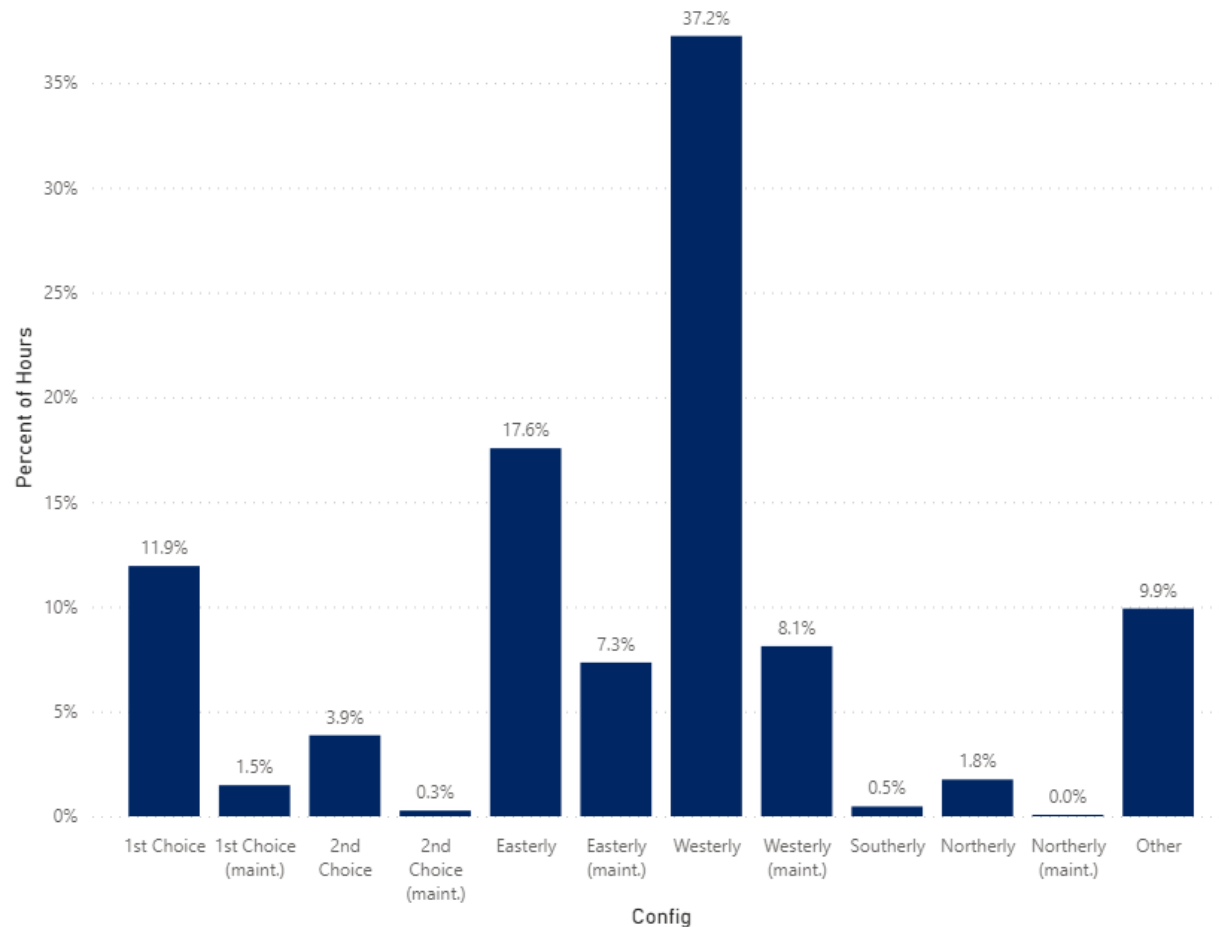


# Primary Configuration by Percent of Hours



This chart shows the percent of total hours spent in each configurations listed below. This only reflects the primary configuration in use at the time and does not mean that all operations during that hour used that configuration. For example, the hour may have had a non-adherent operation that occurred on a different runway, or a change in winds towards the end of the hour may have required a runway change.

Trial Primary Configuration by Hours



Arr	Dep	Configuration
05	33R	1st Choice
06L	33R	1st Choice (maintenance)
06L	33L	1st Choice (maintenance)
05	33L	1st Choice (maintenance)
15L	23	2nd Choice
15R	23	2nd Choice (maintenance)
15L	24R	2nd Choice (maintenance)
15R	24R	2nd Choice (maintenance)
05	05	Easterly
06L	06L	Easterly (maintenance)
23	23	Westerly
24R	24R	Westerly (maintenance)
15L	15L	Southerly
15R	15R	Southerly (maintenance)
33R	33R	Northerly
33L	33L	Northerly (maintenance)