ATM Network Performance Report

June 2019

Table of contents

Summary

Annual Performance

This month marks the end of the FY 2018-19 reporting cycle The arrival airborne delay performance across the year did not meet the target for the median (0.7 minutes, with target 0.6) or the 75th percentile (3.8 minutes, with target 3.4). Compared to FY 2017-18 both figures have increased, the median by 0.1 minutes and the 75th percentile by 0.3 minutes. For the FY 2019-20 the 75th percentile target decreases to 3.3 minutes, the median target is unchanged.

During the year we utilised post-operational analytics to work with airlines and airports to identify improvement opportunities in the management of the ATM Network. Examples include more accurate estimates of final approach speeds into Sydney and taxi out times at the four major airports, so these estimates better reflect actual operations. Changes to the estimated approach speeds at Sydney have been implemented, and updates to the taxi time estimates are pending.

Our long term focus continues to be on building our suite of network management tools through the introduction of Airport Collaborative Decision Making (A-CDM) and Long Range Air Traffic Flow Management, as well as new analysis capabilities, for example Causal Analysis of Delay.

International traffic movements at our largest airports increased by 2.3% during the financial year, while the total number of traffic movements across the network was approximately steady (up 0.3%). This indicates that there are more flights potentially impacting on the effectiveness of the Ground Delay Program, as ground delay is only applied to domestic flights.

June Performance

The combined 75th percentile performance during June for airborne delay across the four major airports (Sydney, Melbourne, Brisbane and Perth) was **4.3** minutes. The median airborne delay across these airports was **1.0** minutes. These results did not meet the KPI targets. The median and 75th percentile increased compared to the same period last year.

The airborne delay outcomes for June were the third highest observed in FY 2019. The number (33) of notable events in June was the equal third highest in FY 2019. There were twelve notable events in Sydney, nine in Melbourne, nine in Brisbane and three in Perth.

The 33 notable events in June are summarised under each of the airport sections below**.** Nineteen of these notable events resulted in a prolonged and moderately elevated airborne delay for the entire day (i.e. 75th percentile greater than seven minutes across the entire day). These events are labelled in **Figure** 1. Fourteen events resulted in a shorter and more intense period of elevated airborne delay (i.e. two or more consecutive hours where the 75th percentile was over 10 minutes).

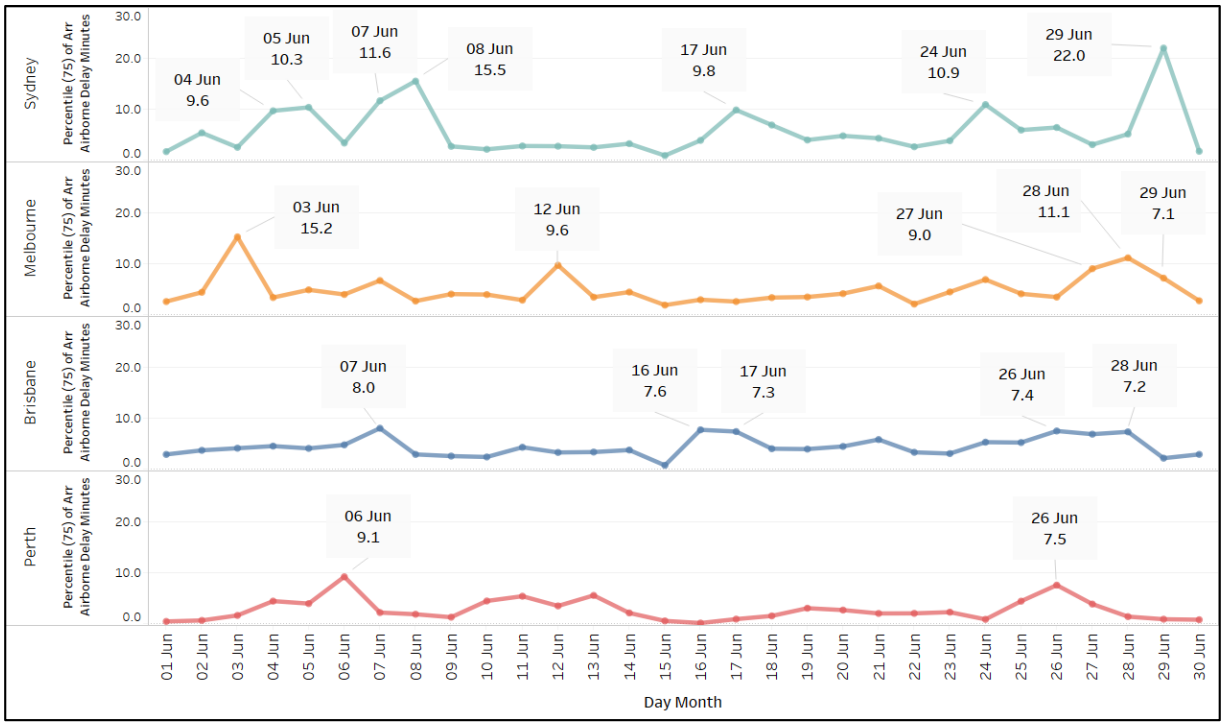

Figure 1: Notable prolonged delay impact events during June 2019

Numbers underneath the dates indicate the extent of the 75th percentile of airborne delay in minutes across the day.

Network Wide Performance

Airborne delay

The combined median and 75th percentile airborne delay at the four major airports is indicated in **Figure 2**.

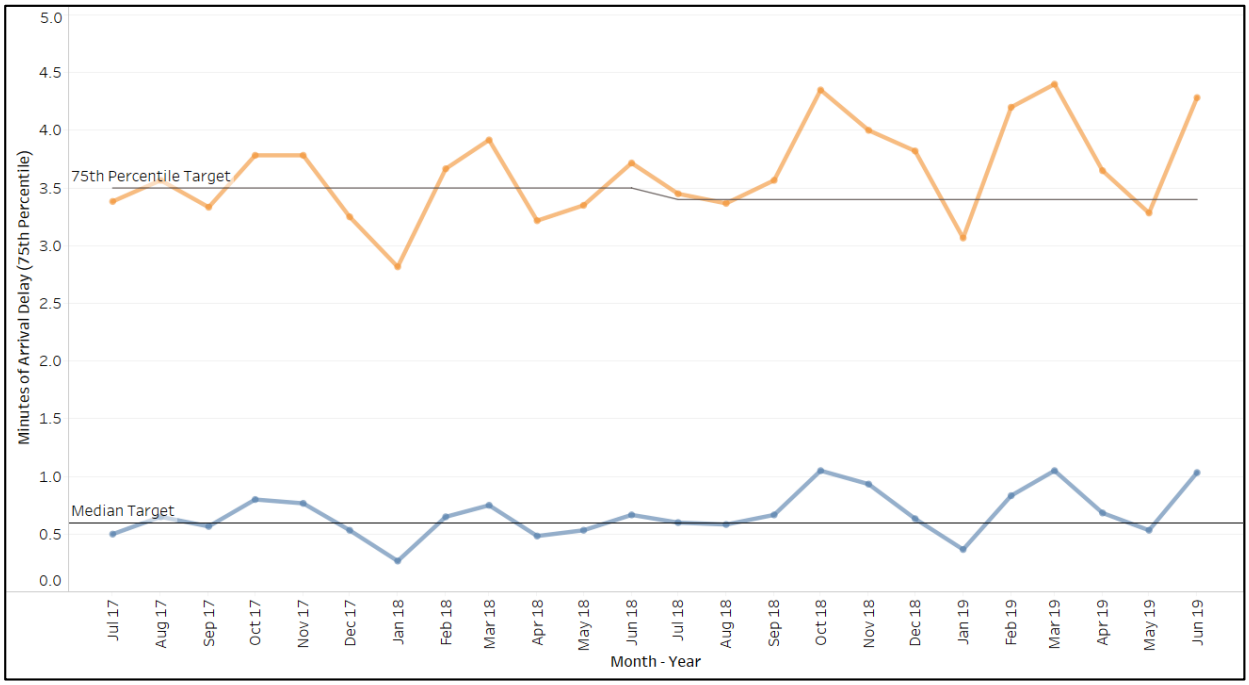

Figure 2: 24-month trend for airborne delay

The long term (48-month) trends of the 75th percentile airborne delay for each of the four major airports are depicted in **Figure 3.** The trends for Sydney and Melbourne are upwards, and the trends for Brisbane and Perth are downwards. More detailed analysis for each airport is presented later in this report.

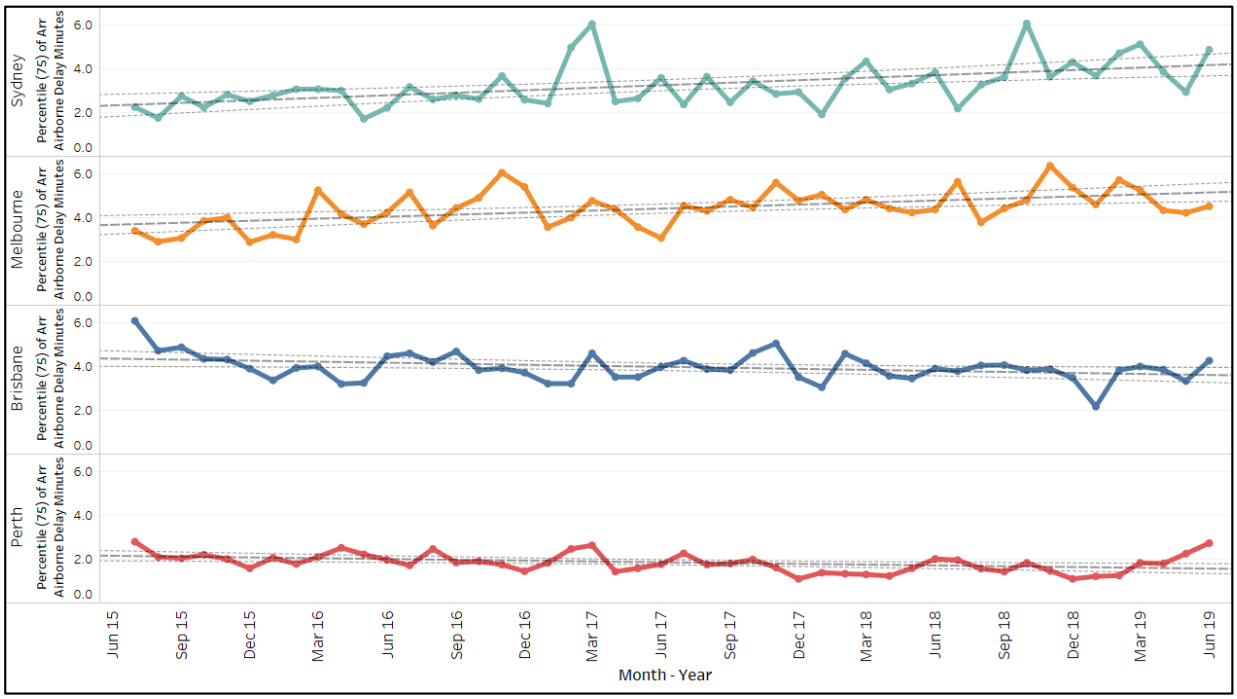

Figure 3: 48-month trend for airborne delay (75th percentile) by airport

The monthly total minutes of airborne delay for Sydney, Melbourne, Brisbane and Perth combined is depicted in **Figure 4**. Figures are adjusted for the number of days in the month. June was the fourth highest month of adjusted total delay in 2018-19.

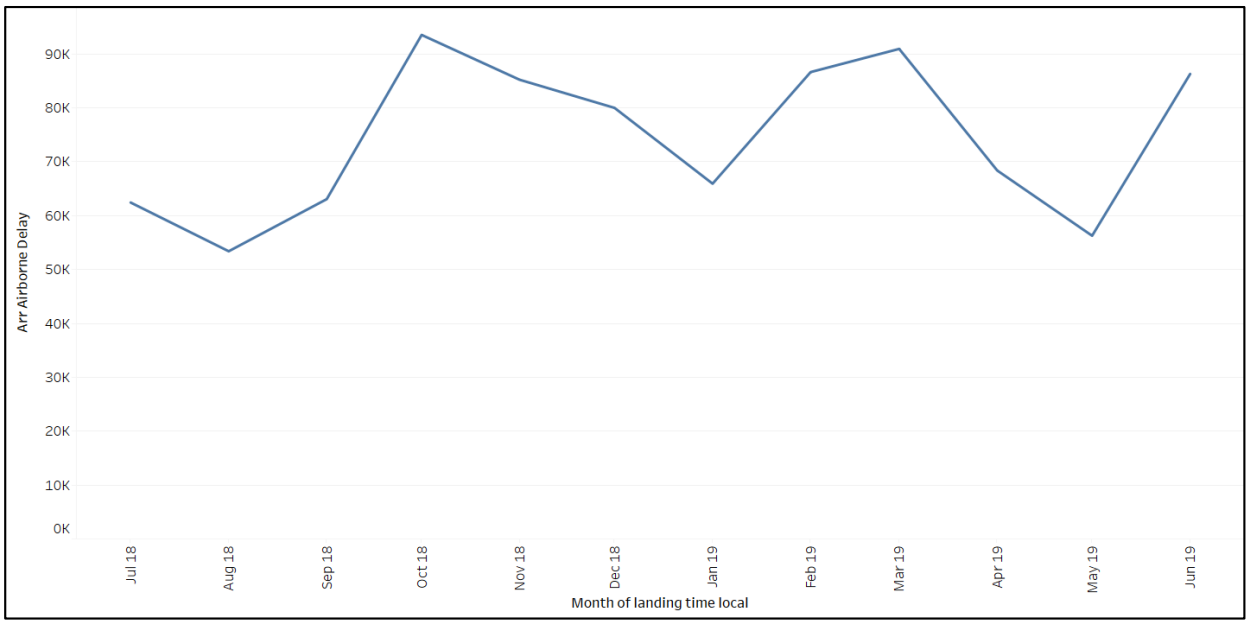

Figure 4: Total amount of airborne delay by month for Sydney, Melbourne, Brisbane and Perth Airports (July 2018 to June 2019, inclusive).

Runway configuration

The runway configuration usage for each airport is shown in **Figure 5**. The availability of Land and Hold Short Operations (LAHSO) at Melbourne decreased by around 36% compared to the same month last year (46 hours compared to 72 hours in June 2018). Single runway usage increased by 59% (211 hours compared to 133 hours in June 2018). In Sydney the use of parallel 34 runway operations decreased by 35% compared to the same month last year (162 hours compared to 250 hours in June 2018). Additionally, the use of parallel 16 operations increased by 44% compared to the same month last year (316 hours compared to 220 hours in June 2018). The profile of runway configurations in Brisbane was similar to the same period last year. Perth was required to use single runway operations for 83% of the time due to the closure of runway 06/24 for regular maintenance. Recorded runway usage hours at Perth was 43% higher than the same month last year due to changes in reporting (480 hours compared to 336 hours in June 2018. However, usage of two runways was less by 61% (83 hours compared to 213 in June 2018).

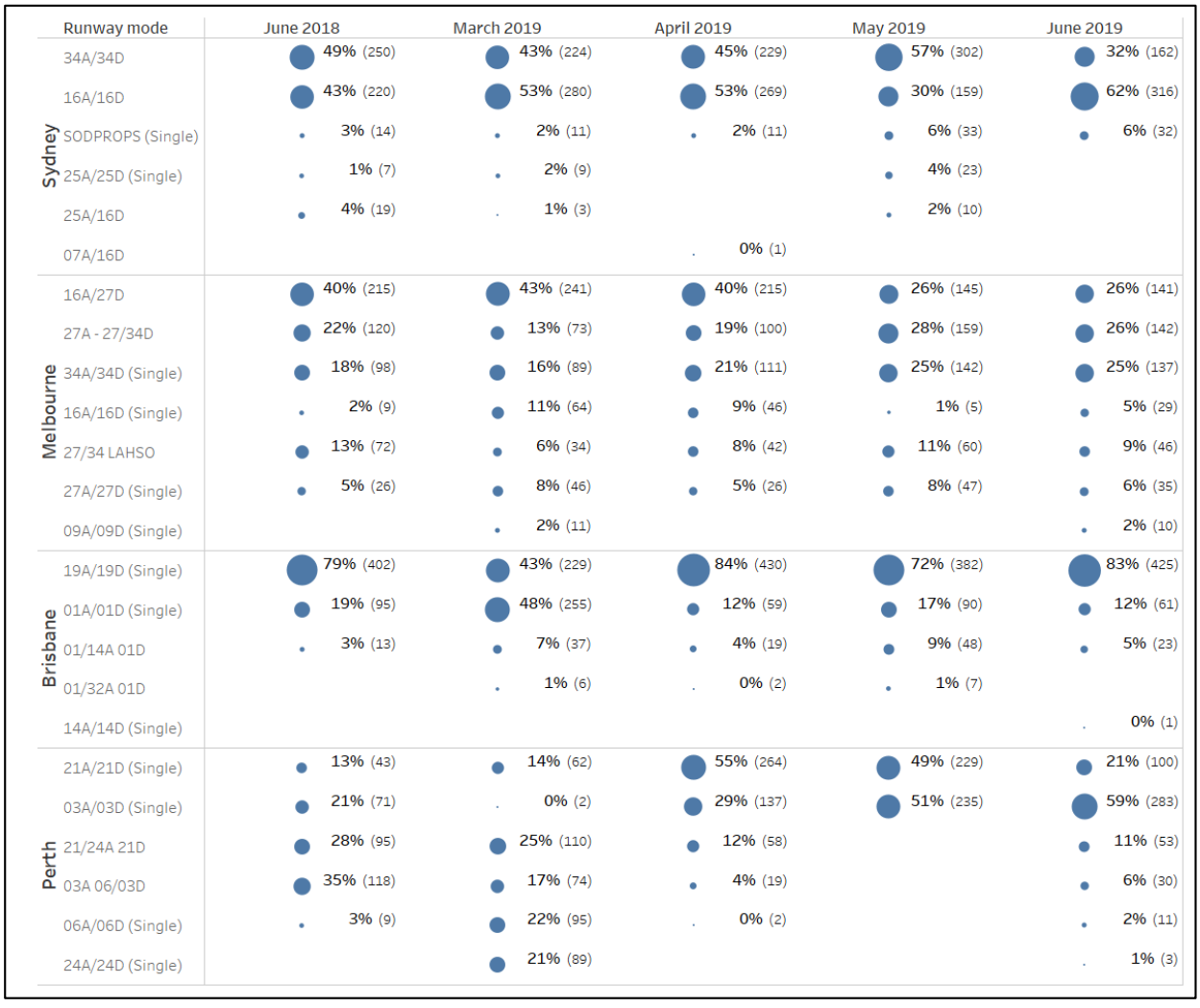

Figure 5: June runway configuration usage (percentage of total and hours in brackets) by airport (Sydney 06-22L, Melbourne 06-23L, Brisbane 06-22L and Perth 06-21L). Single runway configurations indicated in parentheses. Note: Sydney runway mode selection takes into account the Long Term Operating Plan to manage aircraft noise.

Traffic levels and composition changes

Figure 6 shows traffic levels and composition changes since the beginning of 2017. Overall traffic levels are relatively steady across all four airports. Comparing traffic levels in June 2019 to June 2018, Sydney (-0.6%) and Melbourne (-0.4%) have decreased, while Brisbane (2.8%) and Perth (2.8%) have increased. International traffic numbers decreased in Sydney (-0.7%), Melbourne (-1.4%) and Perth (-3.5%), while Brisbane (0.5%) showed an increase.

When comparing the first six months of 2019 to the same period in 2018, Sydney (-0.3%) has decreased in traffic, while Melbourne (0.6%), Brisbane (1.1%) and Perth (3.2%) increased. For internationals Sydney (1.0%), Melbourne (1.4%) and Brisbane (0.4%) increased, while Perth (-4.9%) decreased. The changes in total traffic from 2017 to 2018 were 0.0% at Sydney, 1.7% at Melbourne, -1.3% at Brisbane and 0.2% Perth.

However, there have been changes to the domestic-international flight mix during this time. Sydney, Melbourne and Brisbane have all seen an increase in the level of international traffic (orange bars). In 2018, international traffic increased by 4% in Sydney, 10% in Melbourne and 8% in Brisbane compared to 2017. This indicates that there are more flights potentially impacting on the effectiveness Ground Delay Program as ground delay is only applied to domestic flights. An increase in aircraft that are not required to comply to with a regulated arrival time may lead to increases in airborne delay.

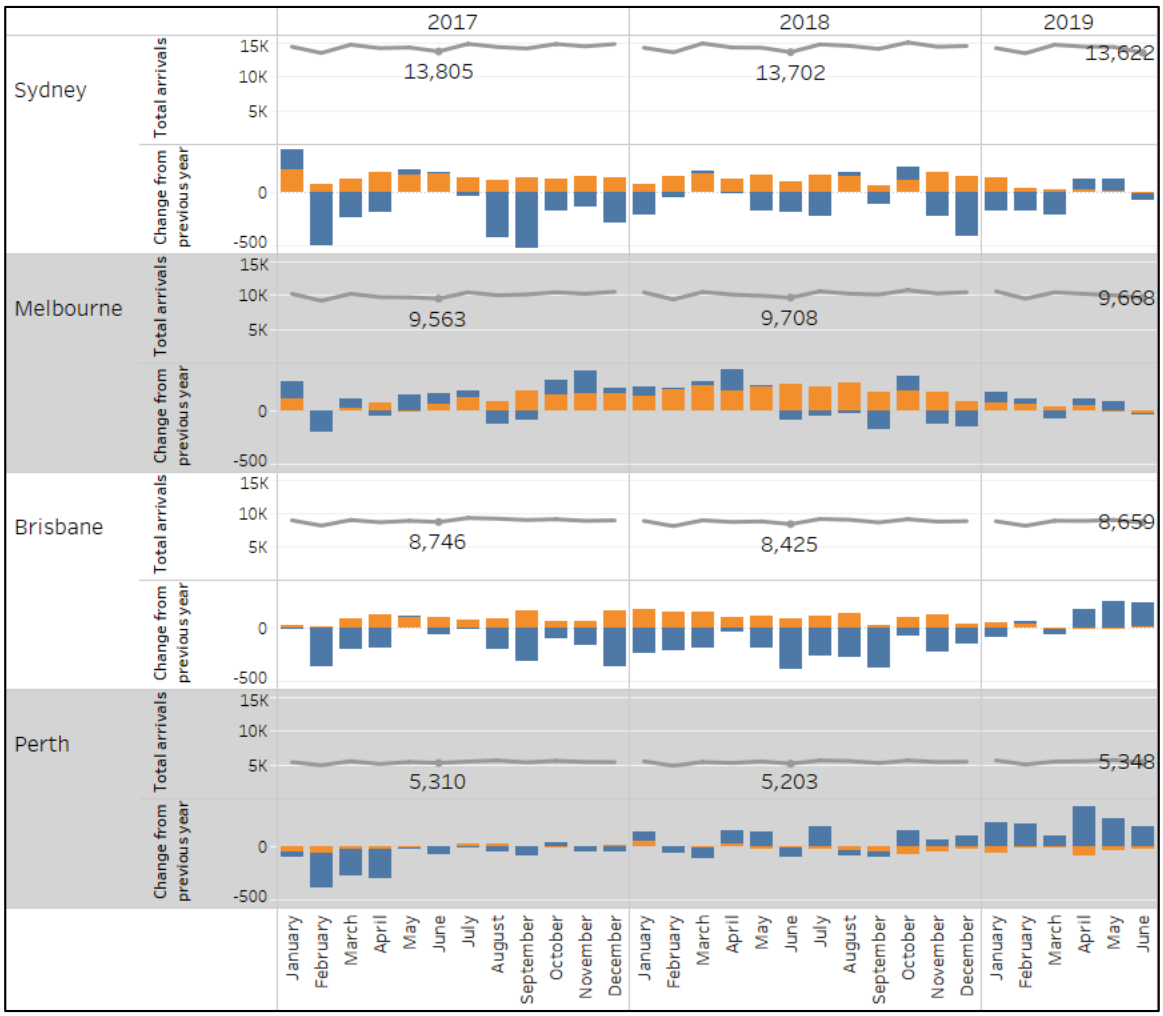

Figure 6: Traffic levels and composition change since January 2017. Grey lines show overall traffic numbers (annotated figures compare current month to same month one and two years earlier). Coloured bars show change in traffic compared to the same month the previous year for domestic (blue) and international (orange) flights.

Demand and capacity

Figure 7 details estimates of the number of hours each month where demand is significantly above capacity (hours where demand is three or more flights higher than the METCDM rate). The 24-month trend for excess demand is down in Brisbane.

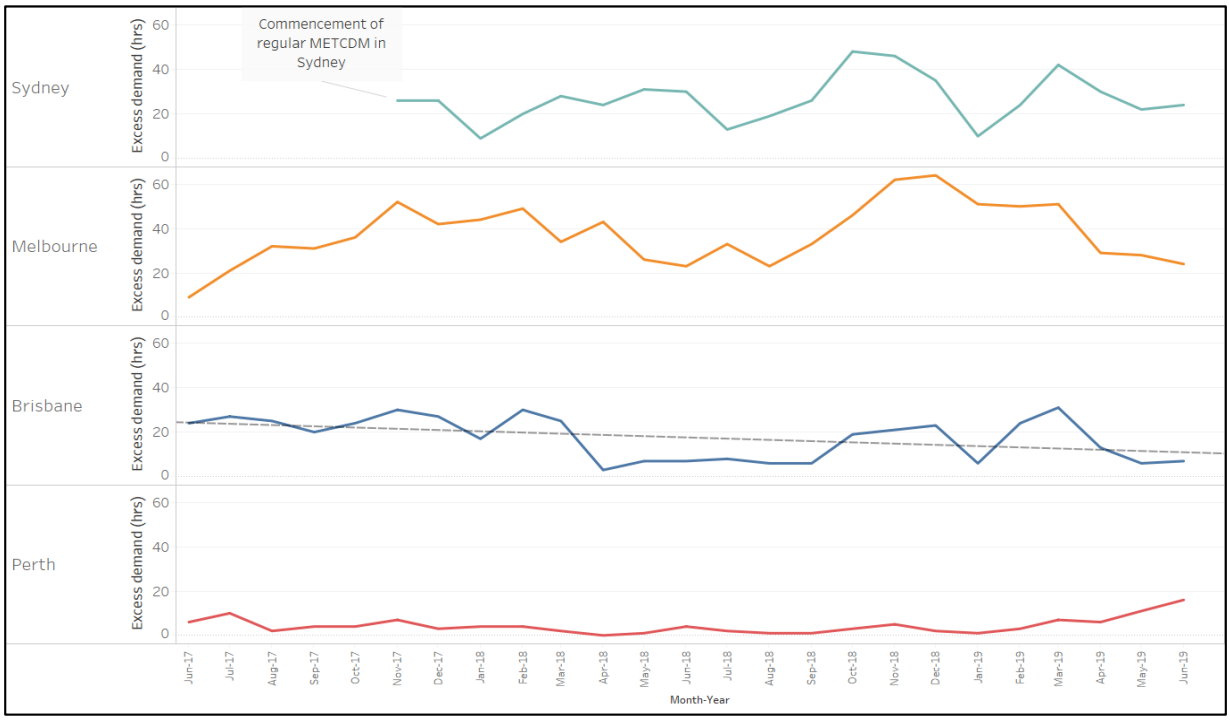

Figure 7: Excess demand estimates. Line indicates number of hours where estimated demand exceeds the METCDM rate for that hour by three or more flights. Demand is estimated using Harmony Base Estimated Landing Time.

Sydney

Airborne delay

The 75th percentile performance figures for airborne delay at Sydney are indicated in **Figure 8.** June performance for the median (1.0 minutes) and the 75th percentile (4.9 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay performance for the median (from 0.4 minutes) and 75th percentile (from 3.8 minutes).

The long-term (48-month) and 24-month trends for airborne delay at Sydney are upwards.

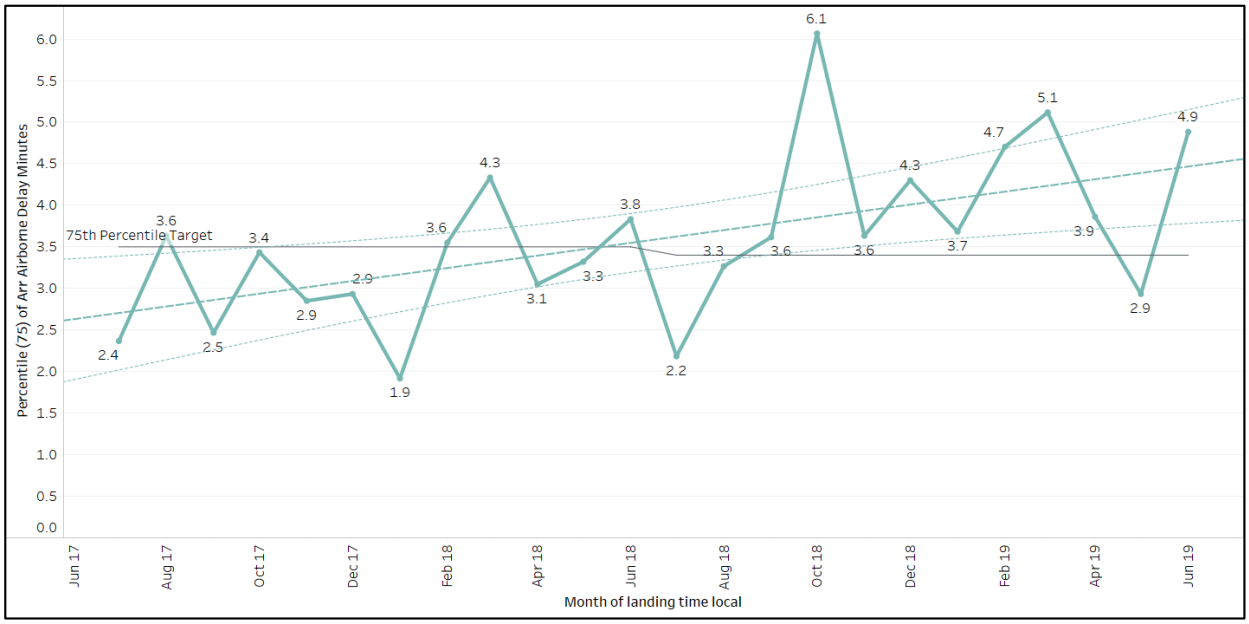

Figure 8: Sydney airborne delay 75th percentile (last 24 months)

Notable events

Table 2 describes the notable airborne delay and other events during June in Sydney.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
2 June	06-07	5.3	34R ILS failed (out of service). No GDP.
3 June	05-06	2.4	34R ILS not available. Flights scheduled to arrive prior to curfew required delay. Reduced capacity due to cross winds and showers.
4 June	09-10 & 18-20	9.6	Morning: Concentration of demand due to off-schedule internationals during busy morning period with poor weather conditions. Afternoon: Reduced capacity due to strong winds and turbulence.
5 June	05-08 & 18-20	10.3	Morning: Concentration of demand due to late non-compliant flights and off-schedule internationals. Afternoon: Reduced tactical capacity due to low visibility.

7 June	07-09 & 18-20	11.6	Reduced rates due to persistent lower than forecast cloud and passing showers.
8 June	06-12	15.5	Fog event with ground stop.
10 June	05-06	2.0	Strong winds and wake turbulence. Flights scheduled to arrive prior to curfew required delay.
17 June	18-19	9.8	Concentration of demand during a period of low cloud and showers.
18 June	08-09	6.8	Unable to deliver planned rate due to fluctuating winds and staffing constraints.
24 June	07-10	10.9	Reduced capacity due to weather diversions and showers. Ground stop at Melbourne caused parking congestion.
29 June	06-11	22.0	Reduced capacity due to fog resulted in diversions of internationals and a Level 1 revision at 2039 UTC. Due to slow lifting fog another Level 1 revision conducted at 2215 UTC.
30 June	05-06	1.6	Flights scheduled to arrive prior to curfew required delay.

Table 2: Notable event descriptions for Sydney.

CTOT variations

Variations from CTOT at Sydney during the morning (0600-1100 local) and evening hours (1800-2000 local) are the focus of this section due to regular concentration of demand leading to increases in delay. **Table 3** provides the flights within this period that departed either early or late with respect to their CTOTs (-5 to +15 minutes). Flights that appear at least twice (early) or five times (late) have been included. This facilitates collaboration to identify patterns and causes of delay.

The CTOT against the ATOT (actual take off time) measure is used as a proxy until the COBT (calculated off blocks time) against AOBT (actual off blocks time) can be routinely reported on.

CTOT Variation	ACID	ADEP	Local - ALDT HOUR	
Early	JST671	Darwin	6	5
	PE721	YTRE	6	3
	RXA311	YGFN	8	3
	RXA333	YGFN	18	3
	RXA456	YNAR	8	3
	RXA953	YARM	7	3
	JST661	Ayers Rock	18	2
	QFA829	Darwin	6	2
	QLK220D	Wagga	7	2
	QLK408	YBDG	9	2
	RXA211	YBNA	8	2
	RXA454	Griffith	8	2
	RXA472	Griffith	18	2
	RXA623	Bathurst	10	2
	VEK	YNBR	10	2
			11	2
	VOZ1192	YPMQ	18	2
	VOZ1529	Hobart	9	2
Late	JST502	Melbourne	9	9
	QFA412	Melbourne	9	7
	JST506	Melbourne	11	6
	QFA420	Melbourne	11	6
	VOZ815	Melbourne	9	6
	QFA408	Melbourne	8	5

Table 3: CTOT variation for Sydney arrivals 0600-1100 and 1800-2000 local – June 2019. Number of occasions that each flight departed early or late with respect to its CTOTs (-5 to +15 minutes).

Melbourne

Airborne delay

The 75th percentile performance figures for airborne delay at Melbourne are indicated in **Figure 9.** June performance for the median (1.2 minutes) and the 75th percentile (4.5 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from 1.1 minutes) and the 75th percentile (from 4.4 minutes).

The long-term (48-month) trend for airborne delay at Melbourne is upwards.

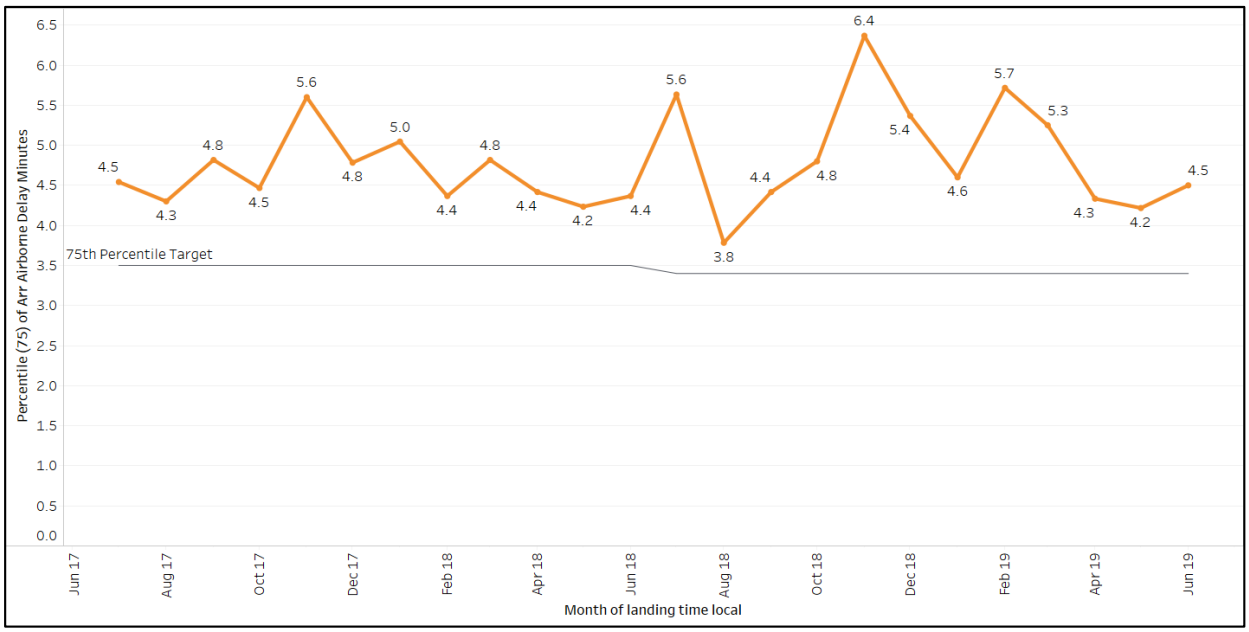

Figure 9: Melbourne airborne delay 75th percentile (last 24 months)

Notable events

Table 4 describes the notable airborne delay events during June in Melbourne.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
3 June	08-12 & 16-18	15.2	Morning: Essendon slot scheme and poor (forecast) weather. Afternoon: reduced rates due to poor weather
4 June	07-08	3.3	Reduced rates due to un-forecast weather.
5 June	18-19	4.8	Concentration of demand due to off-schedule internationals during busy evening period.
12 June	08-09 & 11-12	9.6	Runway inspection due to debris. Concentration of demand due to off schedule internationals.

18 June	07-08	3.3	Un-forecast runway direction. Single runway operations with off-schedule internationals.
24 June	07-10	6.8	Worse than forecast fog resulted in ground stop at 2200 UTC.
27 June	07-09	9.0	Single runway operations with concentration of demand due to off-schedule internationals.
28 June	08-12 & 18-19	11.1	Concentration of demand due to non-compliant flights, off-schedule internationals and an emergency flight during single runway operations.
29 June	15-17	7.1	Concentration of demand due to non-compliant flights and off-schedule internationals, during period of worse than forecast weather.

Table 4: Notable event descriptions for Melbourne.

CTOT variations

The morning peak (0700-1100 local) is in general the most constrained period of the day in Melbourne. However, variations from CTOT during both the morning hours (0700 to 1200) and evening period (1600-1900) are the focus of this section due to regular concentration of demand leading to increases in delay during June. **Table 5** provides the flights within this period that departed either early or late with respect to their CTOTs (-5 to +15 minutes). Flights that appear at least twice (early) or five times (late) have been included. This facilitates collaboration to identify patterns and causes of delay.

The CTOT against the ATOT (actual take off time) measure is used as a proxy until the COBT (calculated off blocks time) against AOBT (actual off blocks time) can be routinely reported on.

CTOT Variation	ACID	ADEP	Local - ALDT HOUR	
Early	QLK58D	Devonport	17	4
	QLK286D	Launceston	18	3
	QLK50D	Devonport	7	2
	QLK52D	Devonport	10	2
	QLK85D	Mildura	18	2
	TGG253	Sydney	17	2
Late	QFA423	Sydney	11	7
	QFA449	Sydney	18	6
	QFA421	Sydney	11	5
	VOZ684	Perth	17	5

Table 5: CTOT variation for Melbourne arrivals 0700-1200 and 1600-1900 local – June 2019. Number of occasions that each flight departed early or late with respect to its CTOTs (-5 to +15 minutes).

Brisbane

Airborne delay

The 75th percentile performance figures for airborne delay at Brisbane are indicated in **Figure 10**. June performance did not meet the target for the median (1.4 minutes) or the 75th percentile (4.3 minutes). Compared to the same month last year, there was an increase in the airborne delay median performance (from 1.1 minutes) and 75th percentile (from 3.9 minutes).

The long-term (48-month) trend for airborne delay at Brisbane is downwards.

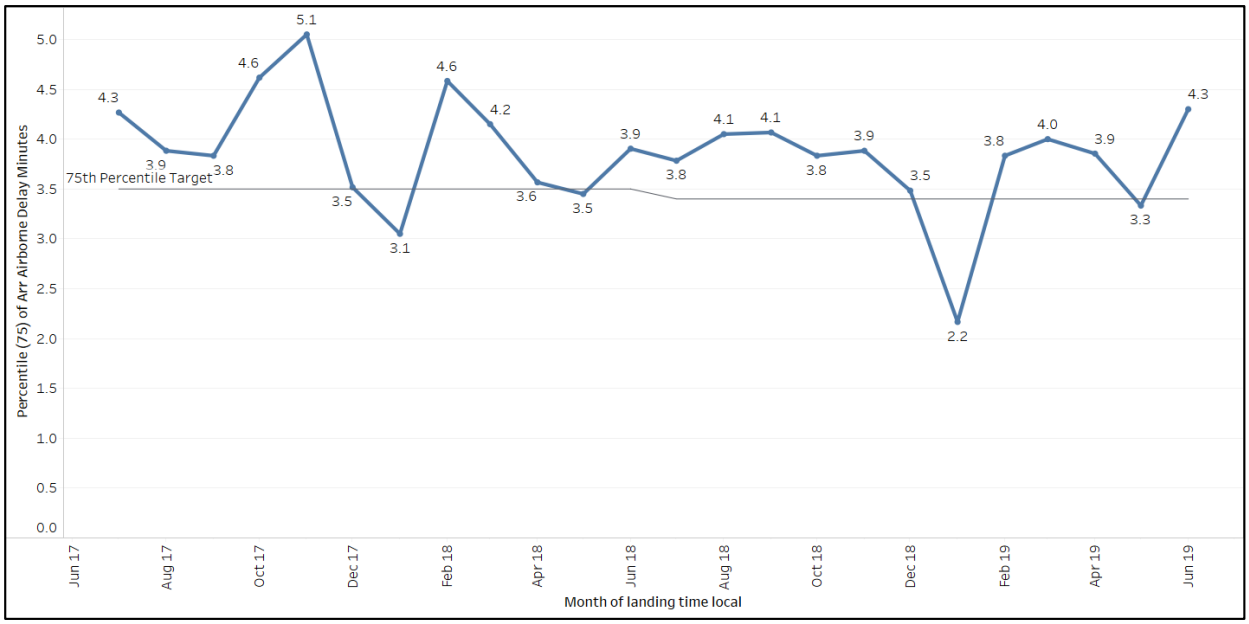

Figure 10: Brisbane airborne delay 75th percentile (last 24 months)

Notable events

Table 6 describes the notable airborne delay events during June in Brisbane.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
6 June	19-20	4.7	Concentration of demand during evening peak period due to off-schedule internationals and late non-compliant flights.
7 June	17-18	8.0	Concentration of demand during evening peak period due to off-schedule internationals and non-compliant flights.
9 June	18-19	2.8	Concentration of demand during evening peak period. No GDP.
16 June	16-20	7.6	Reduced capacity due to worse than forecast weather resulting in several go-arounds.

17 June	09&18	7.3	GDP in the afternoon only. Afternoon: Concentration of demand during evening peak period due to off-schedule internationals.
21 June	16-17	5.7	Concentration of demand due to non-compliant flights.
26 June	18-19	7.4	Concentration of demand due to off-schedule internationals and non-compliant flights during period of poor weather conditions.
27 June	18-19	6.8	Concentration of demand due to off-schedule internationals and non-compliant flights during period of poor weather.
28 June	17-19	7.2	Concentration of demand due to off-schedule internationals and non-compliant flights.

Table 6: Notable event descriptions for Brisbane.

CTOT variations

Variations from CTOT at Brisbane during the afternoon hours (1600-2000 local) are the focus of this section due to regular concentration of demand leading to increases in delay. **Table 7** provides the flights within this period that departed either early or late with respect to their CTOTs (-5 to +15 minutes). Flights that appear at least twice (early) or five times (late) have been included in the table below. This facilitates collaboration to identify patterns and causes of delay.

The CTOT against the ATOT (actual take off time) measure is used as a proxy until the COBT (calculated off blocks time) against AOBT (actual off blocks time) can be routinely reported on.

CTOT Variation	ACID	ADEP	Local - ALDT HOUR	
Early	SKP738	YCCA	17	4
	UJN	Maryborough	19	3
	VEO	YBSU	16	3
	MEH	Maryborough	19	2
	QLK369D	Rockhampton	20	2
	RXA5661	Toowoomba	16	2
	VOZ1498	YBHM	16	2
	YJC	Maryborough	19	2
	YJS	Maryborough	19	2
Late	VOZ1225	Canberra	19	5

Table 7: CTOT variation for Brisbane arrivals 1600-2000 local – June 2019. Number of occasions (minimum two early; minimum five late) that each flight departed early or late with respect to its CTOT (-5 to +15 minutes)

Perth

Airborne delay

The 75th percentile performance figures for airborne delay at Perth are indicated in **Figure 11**. June performance for the median (0.2 minutes) and the 75th percentile (2.7 minutes) met the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from -0.2 minutes) and 75th percentile performance (from 2.0 minutes).

The long-term (48-month) trend for airborne delay at Perth is downwards.

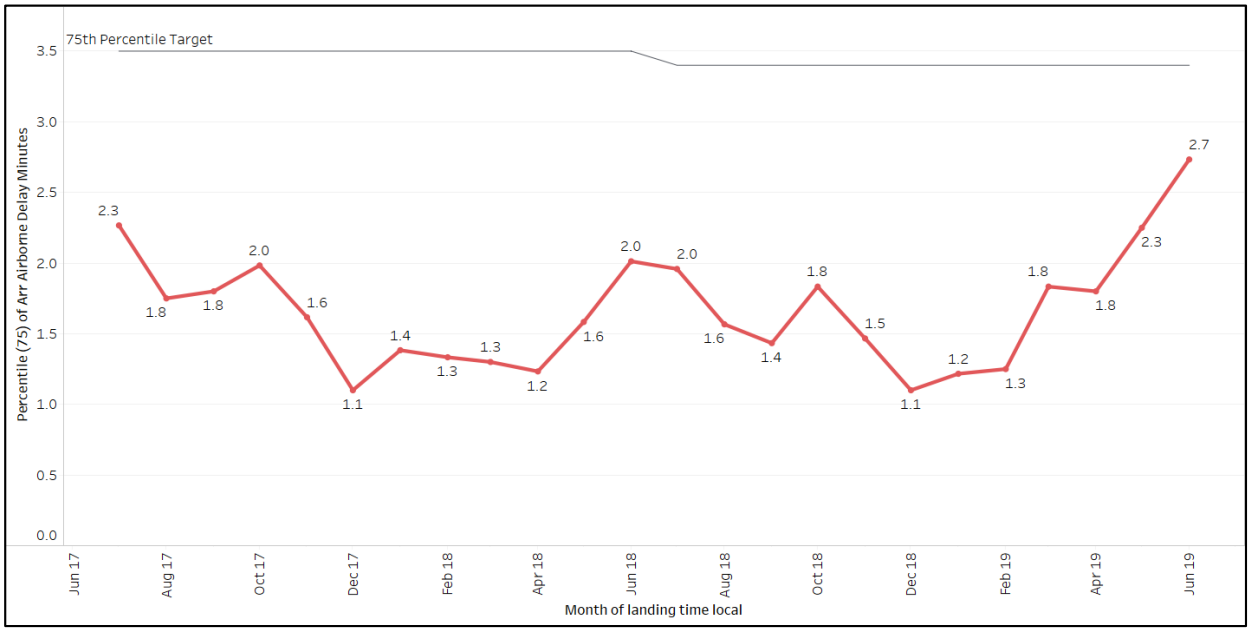

Figure 11: Perth airborne delay 75th percentile (last 24 months)

Notable events

Table 8 describes the notable airborne delay events during June in Perth.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
4 June	18-19	4.3	Concentration of demand due to late non-compliant flights, off-schedule internationals and longer than anticipated flight times.
6 June	18-19	9.1	Concentration of demand due to non-compliant flights. Smoke haze and emergency flight.
26 June	10-12	7.5	Reduced capacity due to worse than forecast weather. Concentration of demand due to off-schedule internationals and non-compliant flights.

Table 8: Notable event descriptions for Perth.

Appendix A

Corporate Plan Key Performance Indicator Profile: Arrival airborne delay

Corporate Plan Description:

The median (and 75th percentile) excess time incurred during the arrival airborne phase of flight in reference to the estimated time of arrival for high-volume operations. (High volume operating environments defined as Brisbane, Melbourne, Perth and Sydney).

Corporate Plan Targets:

Year	18/19	19/20	20/21	21/22
75%	3.4	3.3	3.2	3.1
Median	0.6	0.6	0.6	0.6

What is it: Excess time incurred during the arrival phase of flight.

What is measured: It is measured by comparing the estimated flight time and actual flight time for the portion of the flight within 250 NM of the destination aerodrome.

Why 250NM: The 250NM threshold has been identified as the distance from the aerodrome at which tactical arrival demand/capacity balancing measures start taking effect. It is a true reflection of the tactical arrival management of the flight, and is not skewed by other non-related issues such as congestion at the departure aerodrome.

Why measure Median rather than Average/Mean: In some cases, the actual flight time within 250NM of the destination aerodrome will be less than the estimated flight time (e.g.: ATC has provide track shortening). In the dataset, this translates into a 'negative' value for that particular flight.

The Median shows the mid-point of the data set and allows us to demonstrate our impact on all flights, not just the ones that were delayed. Additionally, over short timeframes and small datasets (such as a daily report), Median measurement is more resilient to data errors and small groups of outliers which may skew the average.

Why measure the 75th percentile: This supplements the Median and is valuable to demonstrate how effectively we have managed the arrival of most of the fleet.

The last 25th percentile can typically contain arrival data from flights that were impacted by non-routine events, such as Medical priority traffic or aircraft in an emergency or diversion.

How do we measure:

Uses the high-fidelity Dalí aircraft trajectory model. For Sydney, some assumptions are built in to calculations as the actual flight path is unique for each flight (open STARs).