ATM Network Performance Report

November 2018

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Summary

This report focusses on the performance of the Air Traffic Network in November 2018. The combined 75th percentile performance during November for airborne delay across the four major airports (Sydney, Melbourne, Brisbane and Perth) was **4.0** minutes, and the median was **0.9** minutes. These results are above the KPI targets and represent an increase compared to the same period last year.

The airborne delay outcomes for November were the second highest observed in 2018. This was a result of a high number (31) of notable events during November. Melbourne was impacted by 17 notable events, which related primarily to thunderstorm activity and concentrations of arrival demand during periods of low capacity.

The performance for the 2018-19 year to date is above the targets for the median (0.8 minutes) and 75th percentile (3.8 minutes). Compared to the same period in 2017-18 there has been an increase in the median (from 0.7 minutes) and the 75th percentile (from 3.6 minutes).

There were 31 notable events in November which are summarised under each of the airport sections below**.** Fifteen 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. Sixteen 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).
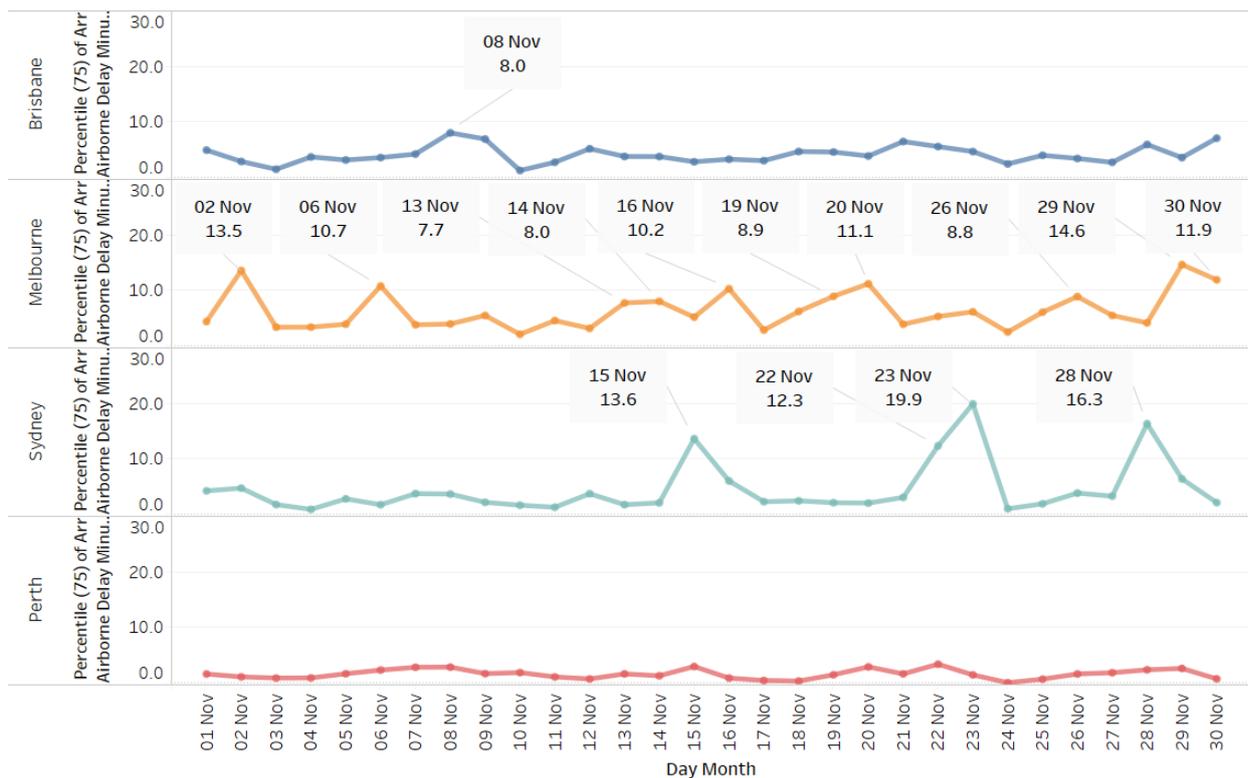

Figure 1: Notable prolonged delay impact events during November 2018

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**. The 24-month trend is statistically flat and close to the target levels.
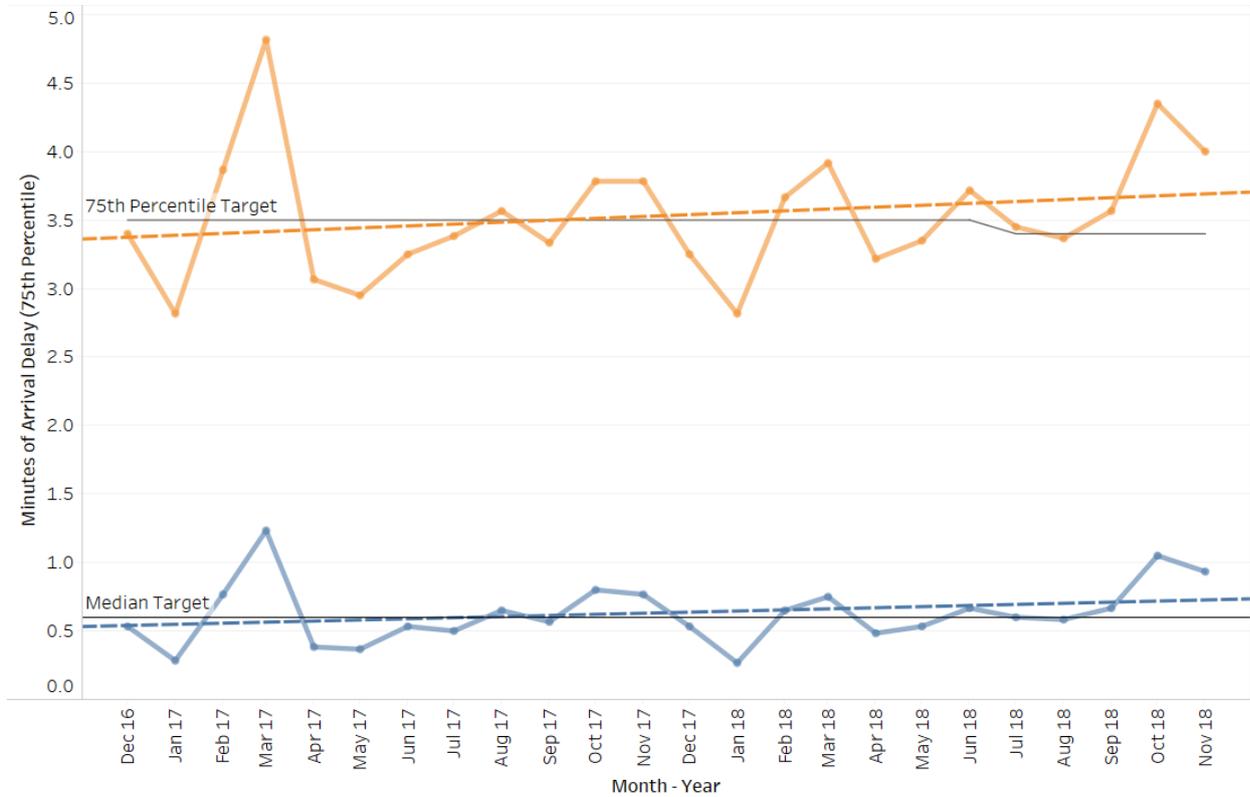

Figure 2: 24-month trend for airborne delay

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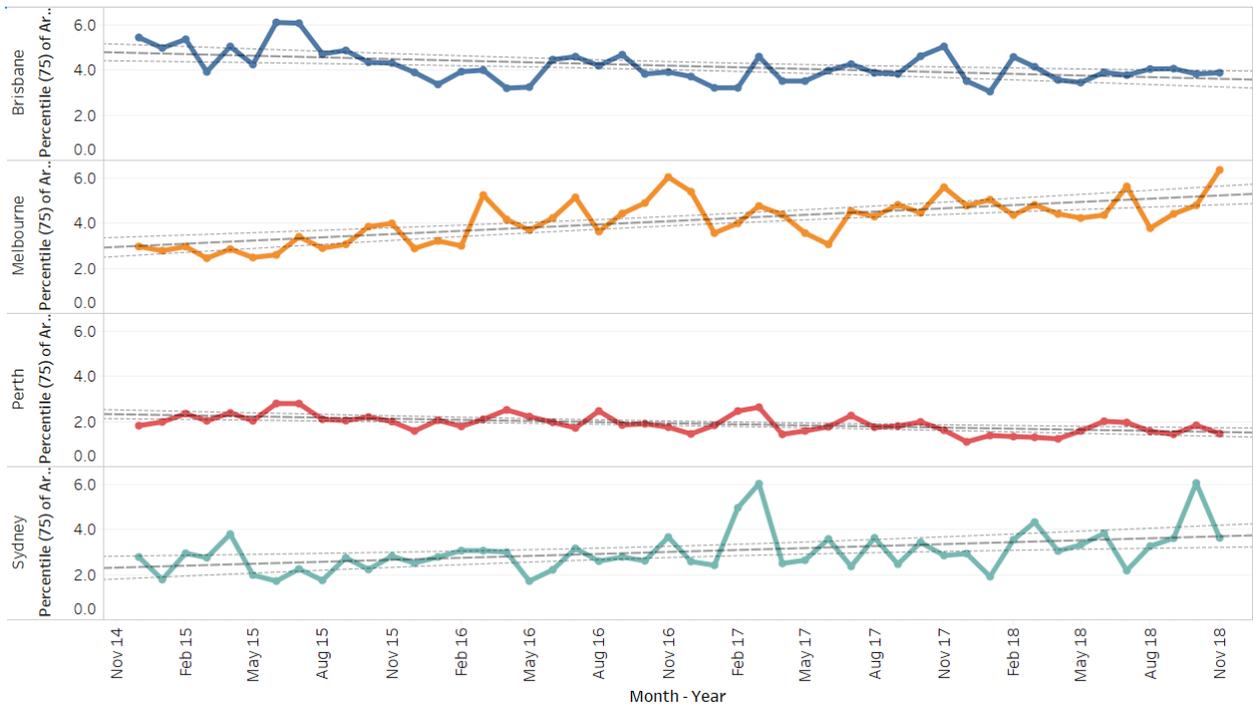
Figure 3: 48-month trend for airborne delay (75th percentile) by airport

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. November was the second highest month of adjusted total delay in the December 2017 to November 2018 period. There is no statistically significant trend.

Figure 4: Total amount of airborne delay by month for
Sydney, Melbourne, Brisbane and Perth Airports.

Sydney

Airborne delay

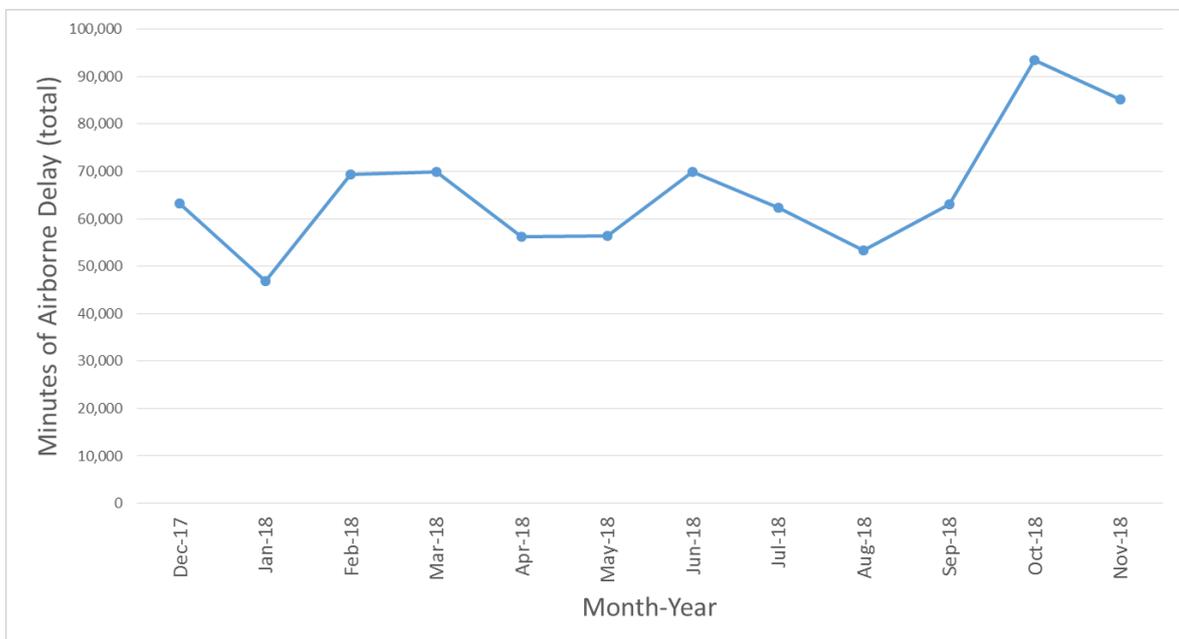The 75th percentile performance figures for airborne delay at Sydney are indicated in **Figure 5.** November performance for the median (0.7 minutes) and the 75th percentile (3.6 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from 0.4 minutes) and 75th percentile performance (from 2.9 minutes).

The long-term (48-month) trend for airborne delay at Sydney is upwards. However, the 24-month trend is flat.

Figure 5: Sydney airborne delay 75th percentile (last 24 months)

Notable events

Table 1 describes the notable airborne delay and other events during November in Sydney.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
02 November	20-21	4.6	Concentration of demand due to late non-compliant departures and flights that experienced departure delays in Melbourne. Coincided with a low capacity period for anticipated thunderstorms.
07 November	18-19	3.6	Concentration of demand due to late non-complaint flights and compliant flights with longer than anticipated flight times.
15 November	17-21	13.6	Reduced capacity in evening due to thunderstorms. Level 2 GDP Revision with rates reduced.

22 November	11-13 & 17-20	12.3	Reduced capacity in late morning and early afternoon due to dust and thunderstorms. Level 2 GDP Revision with rates reduced. Reduced capacity in early evening due to strong winds that resulted in numerous missed approaches. Level 2 GDP Revision with rates reduced until the late evening.
23 November	09-15	19.9	Concentrated demand due to single runway operations commencing earlier than anticipated. Level 2 GDP Revision to realign slots, with rates reduced to account for single runway operations until the end of the day.
28 November	06-19	16.3	Thunderstorms in the morning resulted in no arrivals for 23 minutes. Level 3 GDP Revision (Ground Stop) undertaken. Ground congestion developed during recovery including aircraft parked on runway 07/25. A change in wind direction necessitated use of this runway and a second Level 3 GDP Revision (Ground Stop) was undertaken. Delays reduced in the late evening with clearing weather.

Table 1: Notable event descriptions for Sydney.

Melbourne

Airborne delay

The 75th percentile performance figures for airborne delay at Melbourne are indicated in **Figure 6.** November performance for the median (2.1 minutes) and the 75th percentile (6.4 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from 1.6 minutes) and 75th percentile performance (from 5.6 minutes).

The long-term (48-month) trend for airborne delay at Melbourne is upwards. However, the 24- month trend is flat.
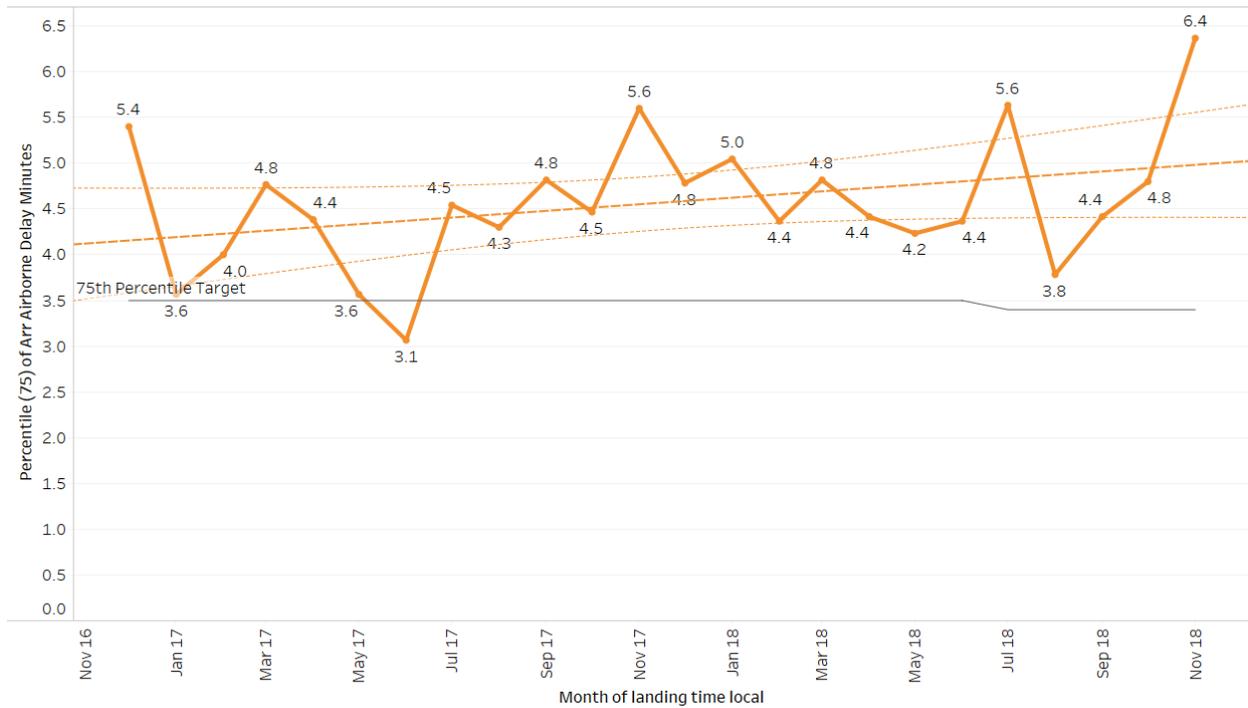

Figure 6: Melbourne airborne delay 75th percentile (last 24 months)

Notable events

Table 2 describes the notable airborne delay events during November in Melbourne.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
02 November	08-22	13.5	Weather deviations and missed approaches due to thunderstorm and strong winds in the morning resulted in elevated airborne delay. Further build-up of delay in afternoon following an extended low-capacity period (single runway operations).
06 November	07-09	10.7	Missed approaches and period of reduced landings in the morning due to thunderstorm. Level 2 GDP Revision with rates unchanged.

09 November	18-20	5.4	Reduced capacity due to worse than forecast wind conditions in the evening (tactical rates lowered).
13 November	18 & 21	7.7	Late non-compliant and off-schedule international flights concentrated demand for two short periods.
14 November	18-19	8.0	Reduced capacity in the evening due to low cloud for longer than forecast. Level 2 GDP Revision with rates reduced.
15 November	18-19	5.1	Build-up of delay in afternoon following an extended low-capacity period (single runway operations).
16 November	14-17	10.2	Concentration of demand due to late non-complaint flights and compliant flights with longer than anticipated flight times at the beginning of a low-capacity period (single runway operations).
18 November	18-19	6.1	Concentration of demand due to late non-complaint flights and compliant flights with longer than anticipated flight times during a low-capacity period (single runway operations).
19 November	18-19	8.9	Concentration of demand due to late non-complaint flights and compliant flights with longer than anticipated flight times during a low-capacity period (single runway operations).
20 November	16-20	11.1	Reduced capacity in the afternoon due to a thunderstorm with limited arrivals for 40 minutes. Recovery hindered by runway change with tactical rates reduced.
22 November	15-17	5.2	Concentration of demand due to late non-compliant departures and flights that experienced departure delays in Sydney.
23 November	10-11	6.1	Concentration of demand due to off-schedule international flights and flights that experienced departure delays in Sydney.
25 November	18-19	6.0	Concentration of demand due to flights with longer than anticipated flight times during busy period.
26 November	08-11	8.8	Concentrated demand due to reduced capacity at the beginning of the morning peak. Tactical rates reduced due to low cloud.

27 November	18-19	5.4	Concentration of demand due to off-schedule internationals and domestic flights that took-off more than 10 minutes later than planned.
29 November	8-12 & 18-19	14.6	Concentration of demand in the morning due to diversions from Essendon during a low-capacity period (single runway operations). Concentration of demand in the afternoon due to late non-compliant flights, a missed approach and a medical emergency during a low-capacity period (single runway operations).
30 November	7-11 & 18-21	11.9	Concentration of demand due to longer than anticipated flight times at the beginning of a low-capacity period (due to low cloud). Concentration of demand due to late non-compliant flights during a low-capacity period (single runway operations).

Table 2: Notable event descriptions for Melbourne.

CTOT (Calculated take off time) variations

The morning peak (0700-1100 local) is in general the most constrained period of the day in Melbourne. Variations from CTOT during the early morning hours are the focus of this section due to regular concentration of demand leading to increases in delay.

Table 1 provides the flights within this period that departed either early or late with respect to their CTOTs (-5 to +15 minutes) on more than one occasion. 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	ADES	Local - ALDT HOUR		
Early	QLK319	YBUD	Brisbane Arrivals	7	■	3
	QLK331D	YGLA	Brisbane Arrivals	7	■	3
	QLK349D	YBRK	Brisbane Arrivals	7	■	3
	VOZ2900	YGLA	Brisbane Arrivals	8	■	3
	QLK319D	YBUD	Brisbane Arrivals	7	■	2
	QLK333D	YGLA	Brisbane Arrivals	8	■	2
	VEM	YMRB	Brisbane Arrivals	9	■	2
Late	QFA512	Sydney Departures	Brisbane Arrivals	9	■	8
	VOZ319	Melbourne Departures	Brisbane Arrivals	10	■	7
	QFA504	Sydney Departures	Brisbane Arrivals	7	■	6
	QFA516	Sydney Departures	Brisbane Arrivals	10	■	6
	QFA608	Melbourne Departures	Brisbane Arrivals	9	■	6
	TGG514	Melbourne Departures	Brisbane Arrivals	8	■	6
	VOZ313	Melbourne Departures	Brisbane Arrivals	9	■	6
	QFA510	Sydney Departures	Brisbane Arrivals	9	■	5
	QFA610	Melbourne Departures	Brisbane Arrivals	10	■	5
	TGG362	Sydney Departures	Brisbane Arrivals	10	■	5
	VOZ909	Sydney Departures	Brisbane Arrivals	7	■	5
	VOZ931	Sydney Departures	Brisbane Arrivals	10	■	5
	JST812	Sydney Departures	Brisbane Arrivals	10	■	4
	VOZ925	Sydney Departures	Brisbane Arrivals	9	■	4
	JST560	Melbourne Departures	Brisbane Arrivals	8	■	3
	QFA604	Melbourne Departures	Brisbane Arrivals	8	■	3
	QJE1544	YSCB	Brisbane Arrivals	9	■	3
	TGG356	Sydney Departures	Brisbane Arrivals	9	■	3
	QFA502	Sydney Departures	Brisbane Arrivals	7	■	2
	QFA506	Sydney Departures	Brisbane Arrivals	8	■	2
	QFA508	Sydney Departures	Brisbane Arrivals	8	■	2
				9	■	2
	QFA514	Sydney Departures	Brisbane Arrivals	10	■	2
	TGG354	Sydney Departures	Brisbane Arrivals	7	■	2
				8	■	2
	VEP	YSTW	Brisbane Arrivals	9	■	2
	VOZ303	Melbourne Departures	Brisbane Arrivals	7	■	2
	VOZ1385	YPAD	Brisbane Arrivals	8	■	2

Table 3: CTOT variation for Melbourne arrivals 0700-1100 local – November 2018. 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 7**. November performance (1.2 minutes median and 3.9 minutes 75th percentile) did not meet the targets. Compared to the same month last year, there was a decrease in the median (from 1.5 minutes) and the 75th percentile (from 5.1 minutes) of airborne delay.

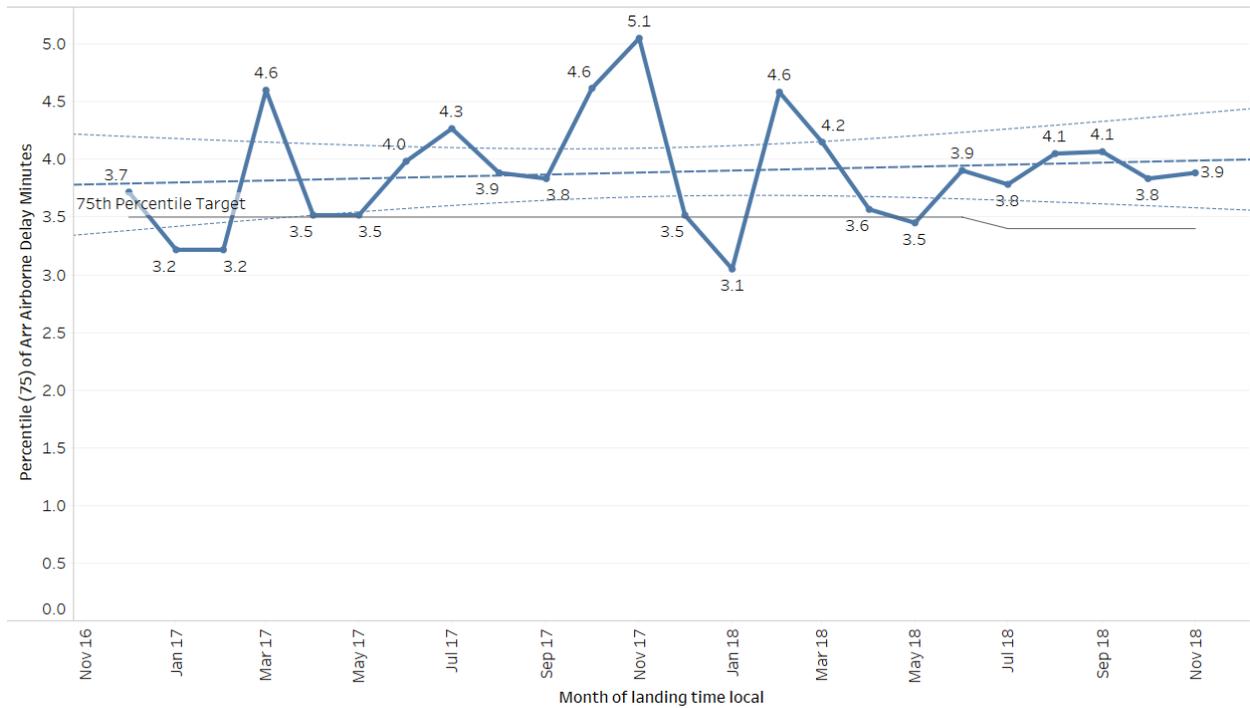The long-term (48-month) trend for airborne delay at Brisbane is downwards. However, the 24-month trend is flat.

Figure 7: Brisbane airborne delay 75th percentile (last 24 months)

Notable events

Table 4 describes the notable airborne delay events during November in Brisbane.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
04 November	18-19	3.6	Concentration of demand due to off-schedule internationals and late non-compliant flights during evening peak period.
08 November	08-09 & 19-20	8.0	Concentration of demand during the peak morning period due to longer than anticipated flight times. Concentration of demand due to off-schedule internationals and late non-compliant flights during the evening peak period.
09 November	18-20	6.8	Concentration of demand due to late non-compliant flights during the evening peak period.

Date	Time	Value	Description
17 November	18-19	2.9	Thunderstorms in the evening resulted in diversions to Brisbane from Gold Coast. An on-demand GDP was implemented for this period.
21 November	19-20	6.4	Reduced capacity due to thunderstorm during the evening peak period. Limited arrivals for 30 minutes.
28 November	12-13 & 19-20	5.9	Reduced capacity due to midday thunderstorm. No arrivals for 27 minutes. Concentration of demand in evening due to flights that experienced departure delays as a result of thunderstorms in Sydney.
29 November	12-13	3.5	Moderate delay due to concentration of demand was exacerbated by late-notice runway change.
30 November	18-20	7.0	Concentration of demand due to domestic flights that took-off more than 10 minutes later than planned.

Table 4: Notable event descriptions for Brisbane.

CTOT variations

Variations from CTOT at Brisbane during the afternoon hours (1800-1900 local) are the focus of this section due to regular concentration of demand leading to increases in delay. Flights that appear at least twice have been included in the table below.

Table 1 provides the flights within this period that departed either early or late with respect to their CTOTs (-5 to +15 minutes) on more than one occasion. 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	ADES	Local - ALDT HOUR		
Early	JST486	YWLM	Brisbane Arrivals	18	■	2
	JST754	YMLT	Brisbane Arrivals	19	■	2
	QFA628	Melbourne Departures	Brisbane Arrivals	19	■	2
	UTY839	YTMO	Brisbane Arrivals	18	■	2
	VOZ1266	YEML	Brisbane Arrivals	19	■	2
Late	VOZ341	Melbourne Departures	Brisbane Arrivals	18	■	11
	QFA628	Melbourne Departures	Brisbane Arrivals	18	■	9
	QFA632	Melbourne Departures	Brisbane Arrivals	19	■	9
	VOZ347	Melbourne Departures	Brisbane Arrivals	19	■	9
	VOZ1225	YSCB	Brisbane Arrivals	18	■	6
	JST566	Melbourne Departures	Brisbane Arrivals	19	■	5
	QFA546	Sydney Departures	Brisbane Arrivals	19	■	5
	QFA548	Sydney Departures	Brisbane Arrivals	19	■	5
	QJE1550	YSCB	Brisbane Arrivals	18	■	5
	VOZ469	Perth Departures	Brisbane Arrivals	19	■	5
	JST566	Melbourne Departures	Brisbane Arrivals	18	■	4
	QFA542	Sydney Departures	Brisbane Arrivals	18	■	4
	VOZ977	Sydney Departures	Brisbane Arrivals	19	■	4
	QFA540	Sydney Departures	Brisbane Arrivals	18	■	3
	QFA544	Sydney Departures	Brisbane Arrivals	18	■	3
				19	■	3
	TGG314	YPAD	Brisbane Arrivals	19	■	3
	VOZ454	YPDN	Brisbane Arrivals	18	■	3
	VOZ616	YBMK	Brisbane Arrivals	18	■	3
	VOZ973	Sydney Departures	Brisbane Arrivals	19	■	3
	VOZ1248	YBRK	Brisbane Arrivals	18	■	3
	VOZ1266	YEML	Brisbane Arrivals	19	■	3
	JST486	YWLM	Brisbane Arrivals	18	■	2
	JST783	YPAD	Brisbane Arrivals	19	■	2
	JST820	Sydney Departures	Brisbane Arrivals	19	■	2
	JST833	YBPN	Brisbane Arrivals	19	■	2
	QFA628	Melbourne Departures	Brisbane Arrivals	19	■	2
	QJE1598	YPAD	Brisbane Arrivals	18	■	2
	QLK465D	YMRB	Brisbane Arrivals	18	■	2
	TGG382	Sydney Departures	Brisbane Arrivals	18	■	2
				19	■	2
	TGG532	Melbourne Departures	Brisbane Arrivals	18	■	2
	VOZ973	Sydney Departures	Brisbane Arrivals	18	■	2
	VOZ1109	YWLM	Brisbane Arrivals	19	■	2

Table 5: CTOT variation for Brisbane arrivals 1800-2000 local – November 2018. Number of occasions (minimum two) 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 8**. November performance (-0.3 minutes median and 1.5 minutes 75th percentile) met the targets. Compared to the same month last year there was a decrease in the median (from 0.0 minutes) and 75th percentile (from 1.6 minutes) of airborne delay.

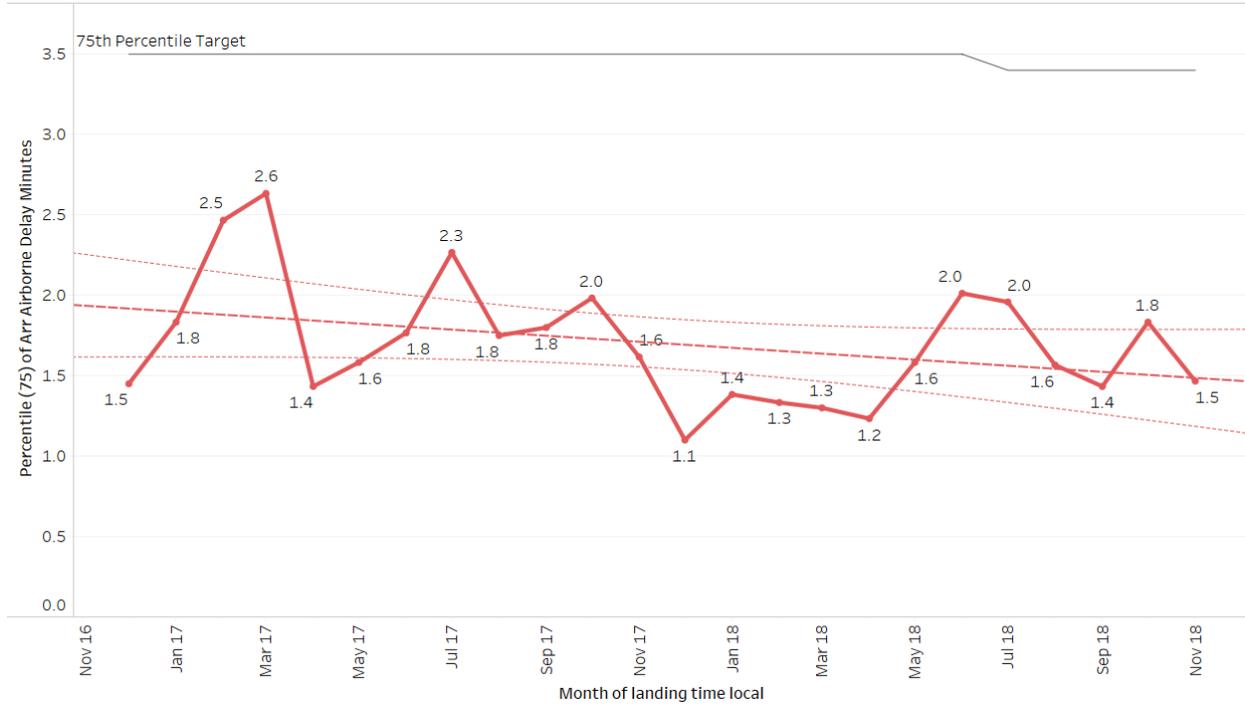The long-term (48-month) and 24-month trends for airborne delay at Perth are downwards.

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

Notable events

There were no notable events in Perth in November.

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	17/18	18/19	19/20	20/21	21/22
75%	3.5	3.4	3.3	3.2	3.1
Median	0.6	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 trajectory-based model. For Sydney, some assumptions are built in to calculations as the actual flight path is unique for each flight (open STARs).