ATM Network Performance Report

December 2018

Table of contents

Summary

This report focusses on the performance of the Air Traffic Network in December 2018. The combined 75th percentile performance during December for airborne delay across the four major airports (Sydney, Melbourne, Brisbane and Perth) was **3.8** minutes. This result is above the KPI target and represents and increase compared to the same period last year. The median airborne delay across these airports was **0.6** minutes. This result met the KPI target but represents an increase compared to the same period last year.

The airborne delay outcomes for December were the third highest observed in 2018. This was a result of a high number (31) of notable events during December. These events were primarily related to thunderstorms (Sydney, Melbourne and Brisbane), reduced capacity due to persistent low cloud (Sydney), and wind conditions that varied from forecast (Melbourne).

The performance for the 2018-19 year to date is above the targets for the median (0.7 minutes) and 75th percentile (3.8 minutes). Compared to the same period in 2017-18 there has been an increase in the median (from 0.6 minutes) and the 75th percentile (from 3.5 minutes).

There were 31 notable events in December which are summarised under each of the airport sections below**.** Eighteen 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. Thirteen 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).

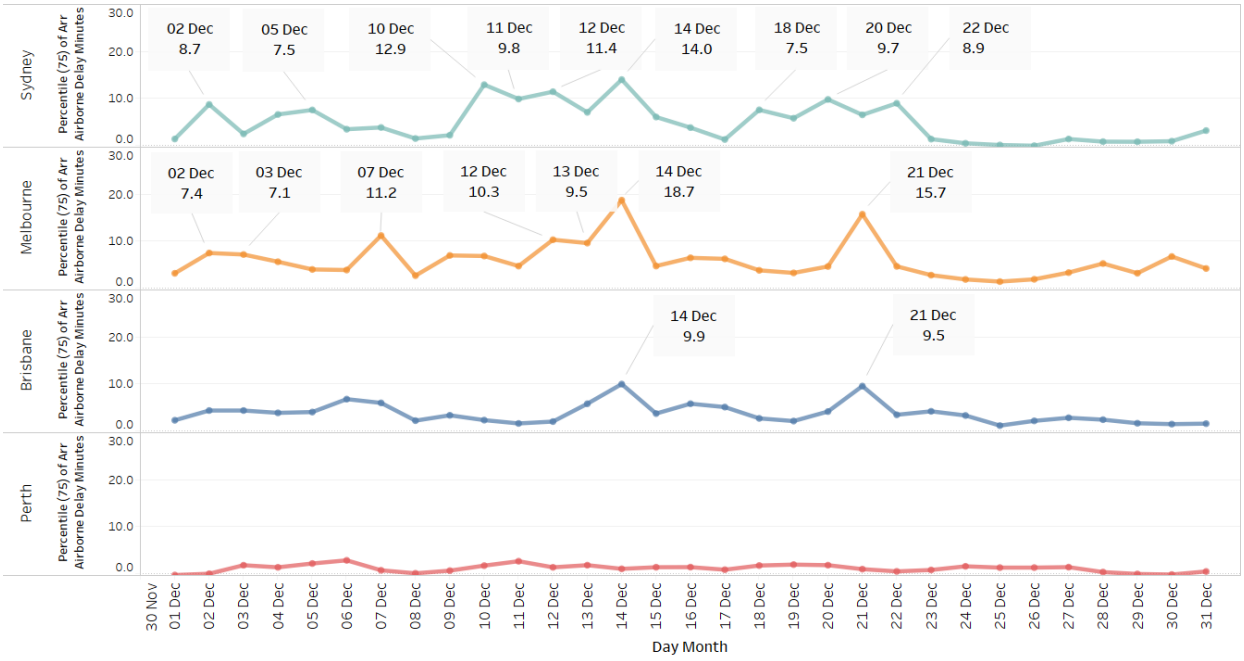

Figure 1: Notable prolonged delay impact events during December 2018

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.

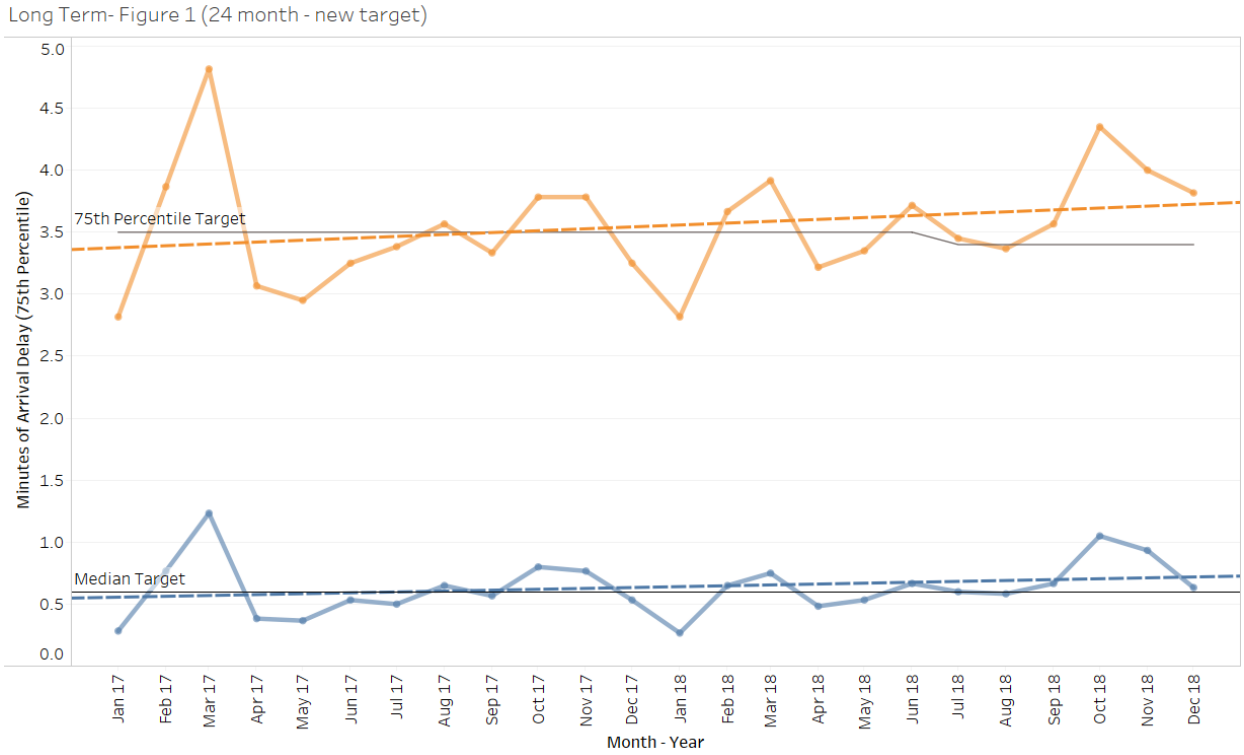

Figure 2: 24-month trend for airborne delay

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

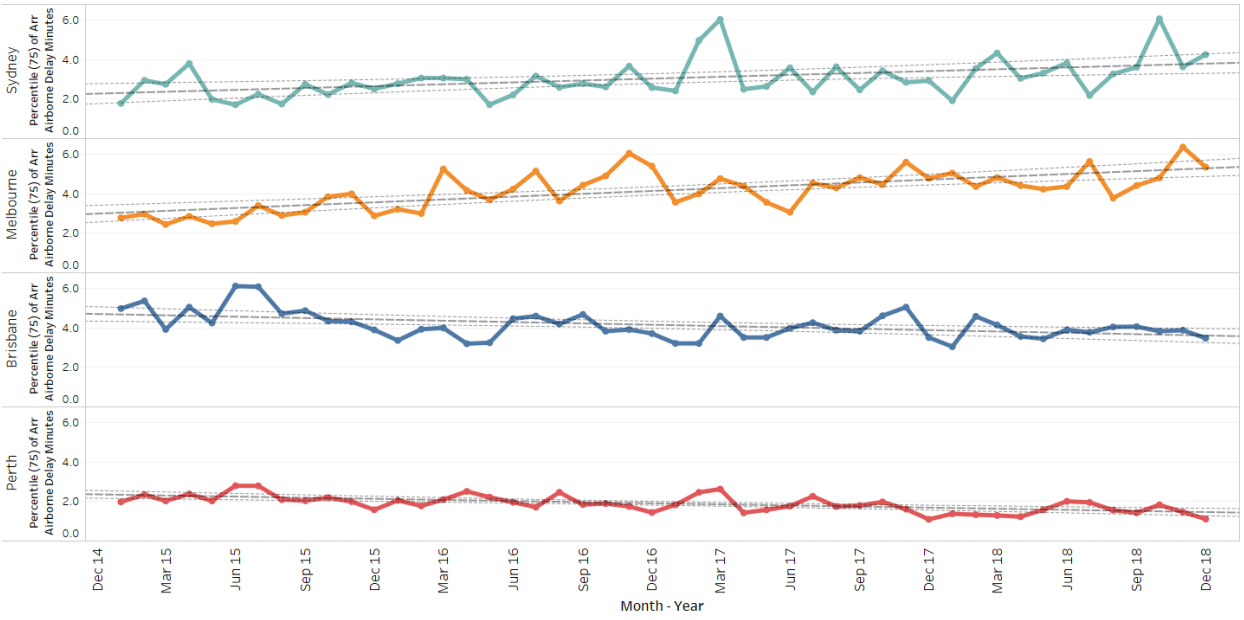

Figure 3: 48-month trend for airborne delay (75th percentile) by airport

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. December was the third highest month of adjusted total delay in 2018. There is no statistically significant trend.

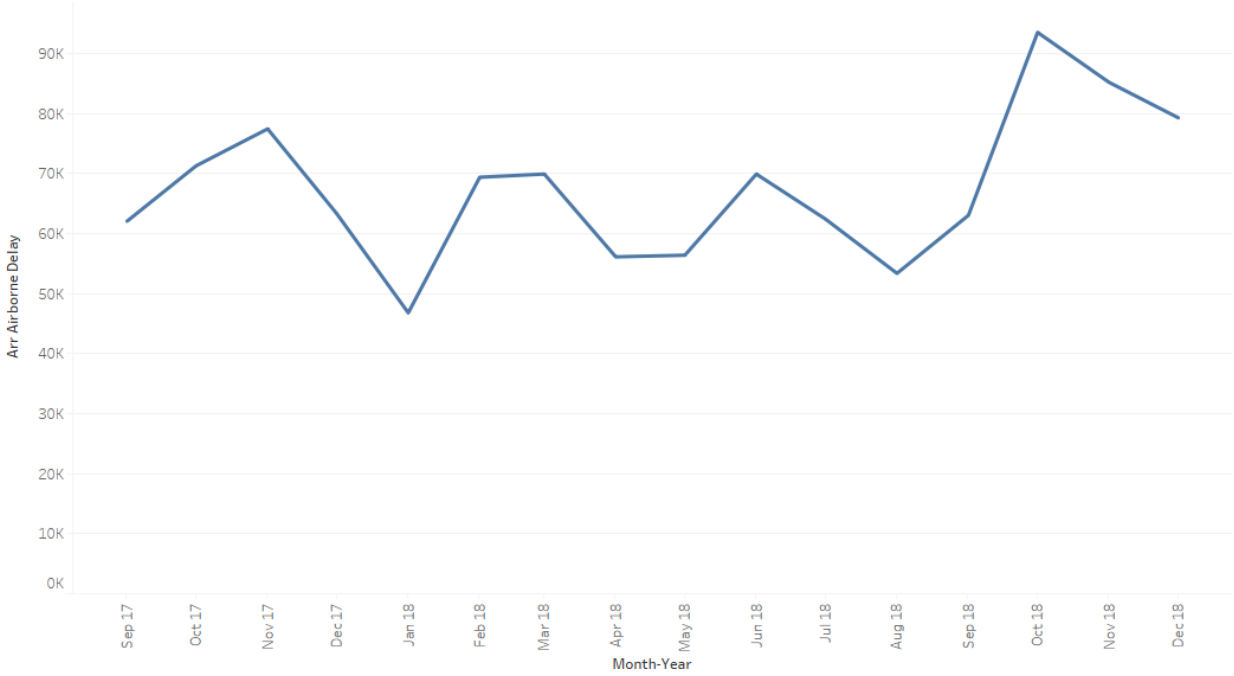

Figure 4: Total amount of airborne delay by month for Sydney, Melbourne, Brisbane and Perth Airports.

Sydney

Airborne delay

The 75th percentile performance figures for airborne delay at Sydney are indicated in **Figure 5.** December performance met the target for the median (0.5 minutes) and did not meet the target for the 75th percentile (4.3 minutes). 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.

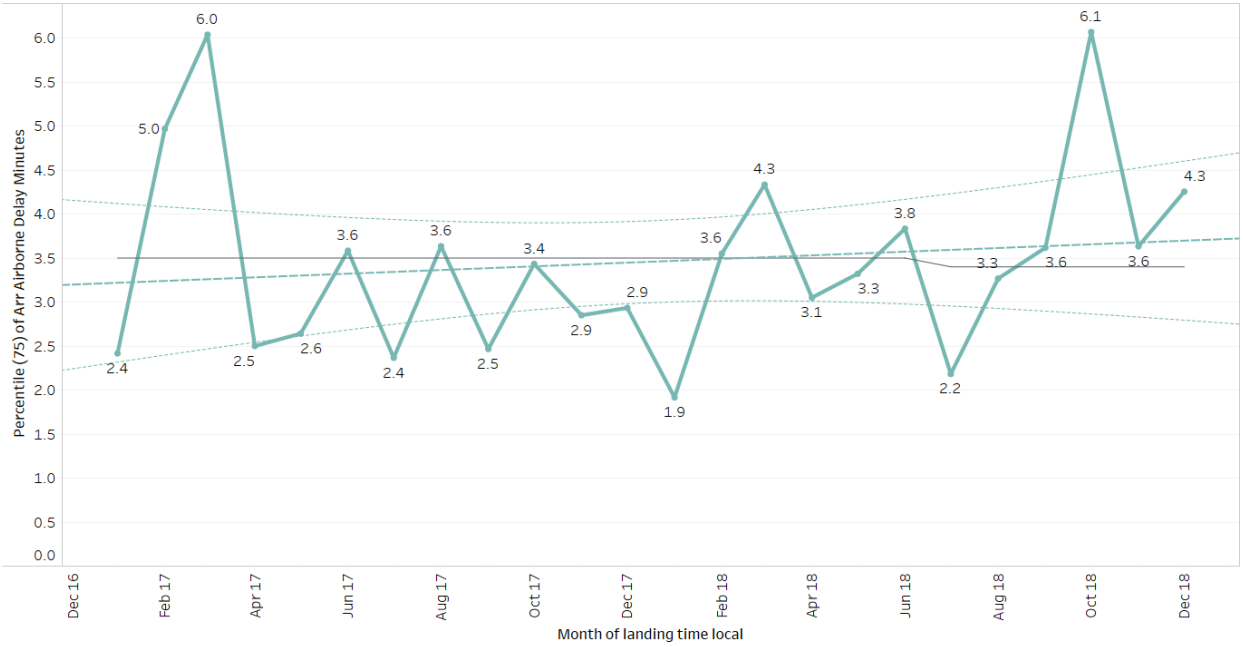

Figure 5: Sydney airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
02 December	19-20	8.7	Concentration of demand due to off-schedule internationals and late non-compliant flights during evening peak period.
04 December	19-20	6.5	Reduced capacity due to an aircraft requiring return for safety issue.
05 December	09-11	7.5	Reduced capacity due to low cloud persisting longer than forecast (tactical rates reduced).

06 December	07-08	3.4	Reduced capacity due to low cloud persisting longer than forecast (tactical rates reduced).
10 December	07-11	12.9	Reduced capacity due to low cloud persisting longer than forecast. Level 2 GDP Revision with rates reduced.
11 December	07-10	9.8	Concentration of demand due to off-schedule international flights during morning peak period.
12 December	07-12	11.4	Reduced capacity due to low cloud persisting longer than forecast (tactical rates reduced).
13 December	19-22	7.0	Diversions for thunderstorms and military airspace restrictions in the early evening. Level 3 GDP Revision (Ground Stop) at 1900L due to heavy storms. Only three arrivals in 20L hour.
14 December	09-13 & 15-20	14.0	Level 2 GDP Revision in morning due to persistent low cloud and increased thunderstorm risk. Thunderstorms in afternoon and evening resulted in increased traffic due to flights diverting to Sydney from nearby airports. Level 3 GDP Revision (Ground Stop) at 1600L due to increasing airborne delay.
16 December	19-20	3.7	Reduced capacity due to thunderstorm during evening peak period.
18 December	07-09 & 18	7.5	Concentration of demand due to off-schedule international flights during morning peak period. Concentration of demand due to late non-complaint flights during evening peak period.
19 December	18-21	5.7	Reduced capacity due to thunderstorm and runway changes during evening peak period.
20 December	17-22	9.7	Reduced capacity due to thunderstorms in the late afternoon and evening. Several periods of significantly reduced arrivals led to a Level 2 GDP Revision and a Level 3 GDP Revision.
21 December	09-11	6.4	Reduced capacity in morning due to Precision Runway Monitor not available (tactical rates reduced).

22 December	09-12	8.9	Reduced capacity in the morning due to tower staffing constraints (tactical rates reduced).

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.** December performance for the median (1.5 minutes) and the 75th percentile (5.4 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from 1.2 minutes) and 75th percentile performance (from 4.8 minutes).

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

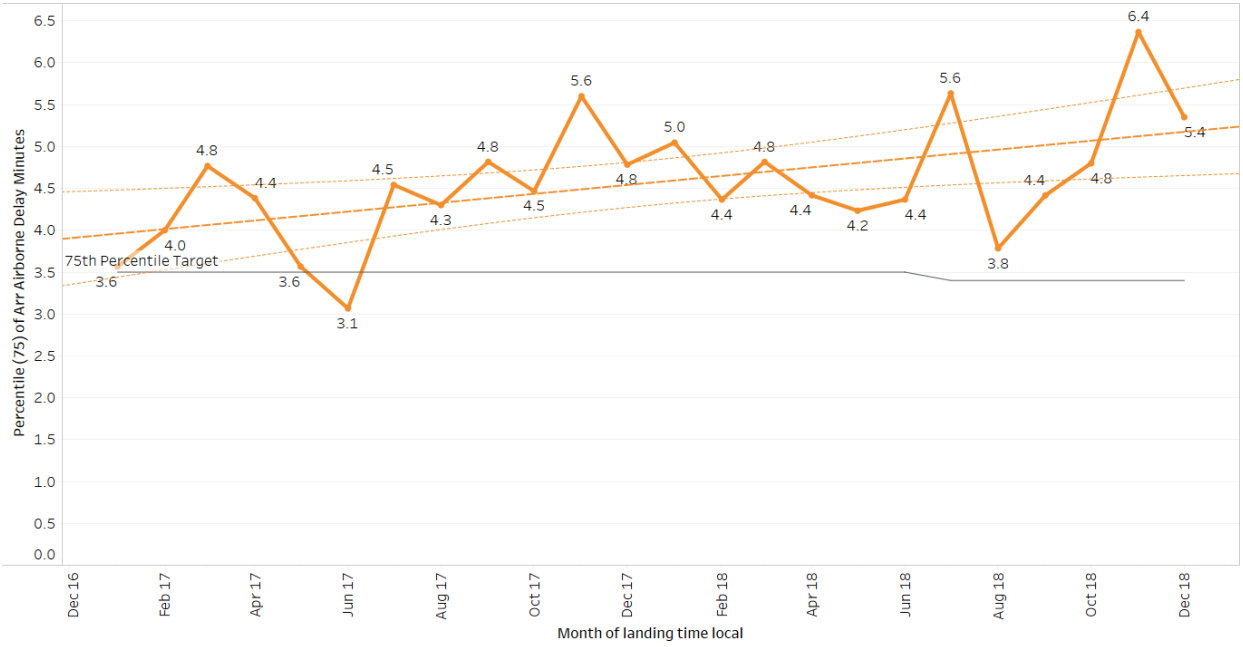

Figure 6: Melbourne airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
02 December	16-19	7.4	Reduced capacity due to unfavourable wind conditions. Single runway operations continued for longer than planned (tactical rates reduced).
03 December	15-16 & 18	7.1	Concentration of demand due to late non-compliant flights during period of low rates (single runway operations).
07 December	10-11 & 16-19	11.2	Reduced capacity due to unfavourable wind conditions. Single runway operations continued for longer than planned (tactical rates reduced).

09 December	18-19	6.9	Diversions north of Melbourne due to thunderstorms.
12 December	08 & 19-21	10.3	Reduced capacity in morning due to unfavourable wind conditions. Single runway operations commenced earlier than planned (tactical rates reduced). Reduced capacity due to thunderstorms in evening. No arrivals for 18 minutes.
13 December	07-09 & 21-22	9.5	Concentration of demand due to off-schedule internationals at the beginning of a low-capacity period (low cloud and rain). Increased traffic due to diversions from thunderstorms in Sydney.
14 December	08-12 & 16-20	18.7	Reduced capacity due to thunderstorms in morning. Level 2 GDP Revision with rates reduced. Reduced capacity due to thunderstorms in the afternoon and evening (tactical rates reduced). Level 2 GDP Revision.
20 December	18-20	4.5	Reduced capacity due to low cloud in the evening (tactical rates reduced). Increased traffic due to diversions from thunderstorms in Sydney.
21 December	07-12 & 18-21	15.7	Concentration of demand due to off-schedule internationals at the beginning of a low-capacity period (low cloud). Reduced capacity due to low cloud in the evening (tactical rates reduced).
22 December	07-08	4.6	Concentration of demand due to longer than anticipated flight times during the morning peak period.

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	RXA3752	Mount Gambier	Melbourne Arrivals	8	6
	QLK50D	Devonport	Melbourne Arrivals	7	3
	QLK52D	Devonport	Melbourne Arrivals	10	3
	QLK280D	Launceston	Melbourne Arrivals	7	3
	JST529	Sydney	Melbourne Arrivals	7	2
	RXA3653	Mildura	Melbourne Arrivals	8	2
Late	QFA417	Sydney	Melbourne Arrivals	10	6
	TGG213	Sydney	Melbourne Arrivals	8	6
	QFA411	Sydney	Melbourne Arrivals	9	5
	VOZ824	Sydney	Melbourne Arrivals	10	5
	JST503	Sydney	Melbourne Arrivals	8	4
	QFA415	Sydney	Melbourne Arrivals	9	4
	QFA419	Sydney	Melbourne Arrivals	10	4
	JST677	Darwin	Melbourne Arrivals	7	3
	JST700	Hobart	Melbourne Arrivals	9	3
	VOZ252	Canberra	Melbourne Arrivals	7	3
	VOZ800	Sydney	Melbourne Arrivals	7	3
	VOZ812	Sydney	Melbourne Arrivals	9	3
	JST473	Williamtown	Melbourne Arrivals	8	2
	JST503	Sydney	Melbourne Arrivals	9	2
	JST507	Sydney	Melbourne Arrivals	10	2
	JST529	Sydney	Melbourne Arrivals	8	2
	JST561	Brisbane	Melbourne Arrivals	10	2
	JST575	Brisbane	Melbourne Arrivals	9	2
	JST732	Launceston	Melbourne Arrivals	9	2
	JST773	Adelaide	Melbourne Arrivals	9	2
	JST971	Perth	Melbourne Arrivals	7	2
	QFA409	Sydney	Melbourne Arrivals	8	2
	QFA415	Sydney	Melbourne Arrivals	10	2
	QFA461	Sydney	Melbourne Arrivals	10	2
	QFA1010	Hobart	Melbourne Arrivals	7	2
	TGG513	Brisbane	Melbourne Arrivals	10	2

Table 3: CTOT variation for Melbourne arrivals 0700-1100 local – December 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**. December performance (0.8 minutes median and 3.5 minutes 75th percentile) did not meet the targets. Compared to the same month last year, the median and 75th percentile of airborne delay were steady.

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

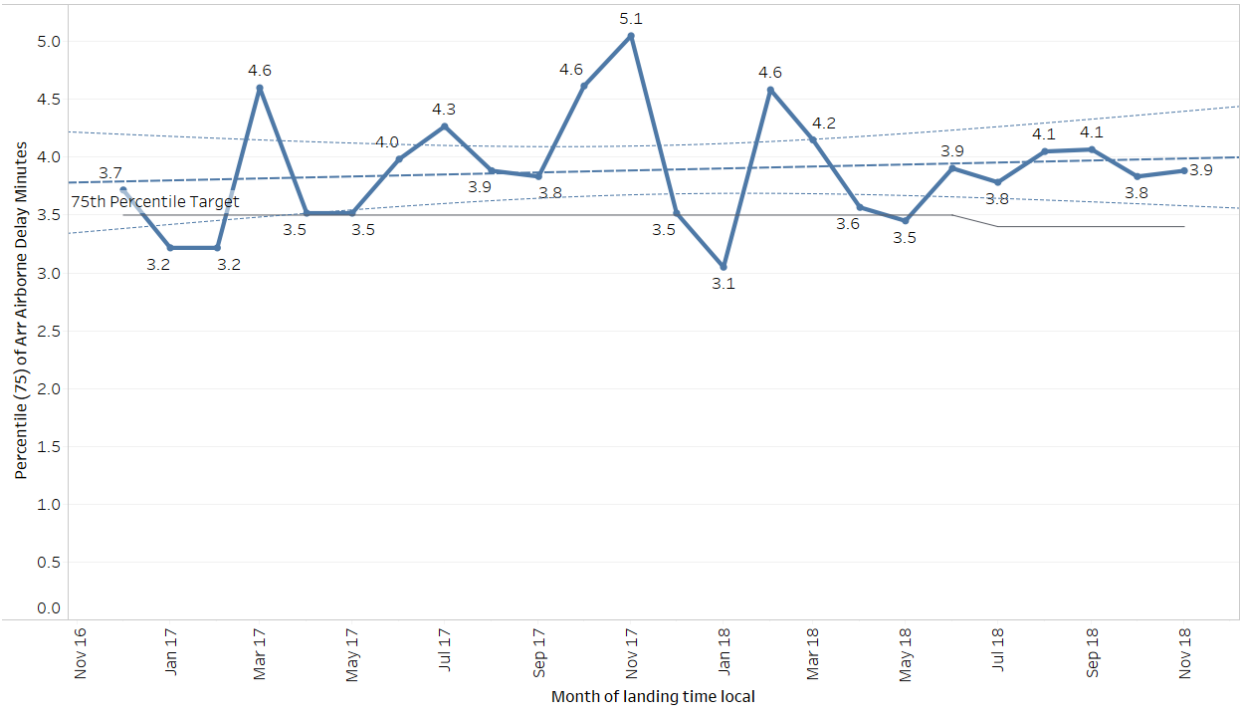

Figure 7: Brisbane airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
06 December	20-21	6.7	Concentration of demand due to longer than anticipated flight times during the evening peak period.
07 December	19-20	5.9	Concentration of demand due to late non-compliant flights during evening peak period.
14 December	16-22	9.9	Reduced capacity due to thunderstorms in the afternoon and evening. Periods of 20 minutes and 23 minutes with no arrivals. Concentration of demand due to late departures from Sydney and Melbourne airports that also experienced thunderstorms.

21 December	17-22	9.5	Reduced capacity due to thunderstorms in late afternoon and evening. Level 1 GDP Revision with rates reduced and Level 3 GDP Revision (Ground Stop) due to increasing airborne delay.
22 December	18-19	3.4	Reduced capacity due to thunderstorms in the evening. Increased traffic due to aircraft diverted from Gold Coast Airport.
23 December	18-19	4.1	Concentration of demand due off-schedule internationals and late non-compliant flights.

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	UJX	Maryborough	Brisbane Arrivals	19	3
	MEH	Maryborough	Brisbane Arrivals	18	2
	PCF3	Sydney	Brisbane Arrivals	19	2
	QLK325	Bundaberg	Brisbane Arrivals	18	2
	QLK325D	Bundaberg	Brisbane Arrivals	18	2
	UJI	Maryborough	Brisbane Arrivals	19	2
	UJL	Toowoomba	Brisbane Arrivals	19	2
Late	VOZ341	Melbourne	Brisbane Arrivals	18	13
	VOZ1225	Canberra	Brisbane Arrivals	18	11
	QFA628	Melbourne	Brisbane Arrivals	18	7
	QFA632	Melbourne	Brisbane Arrivals	19	6
	VOZ1248	Rockhampton	Brisbane Arrivals	18	6
	JST566	Melbourne	Brisbane Arrivals	18	5
	JST820	Sydney	Brisbane Arrivals	19	5
	QFA544	Sydney	Brisbane Arrivals	18	4
	QJE1757	Cairns	Brisbane Arrivals	18	4
	VOZ469	Perth	Brisbane Arrivals	19	4
	JST566	Melbourne	Brisbane Arrivals	19	3
	QFA542	Sydney	Brisbane Arrivals	18	3
	VOZ965	Sydney	Brisbane Arrivals	18	3
	VOZ981	Sydney	Brisbane Arrivals	19	3
	MEH	Maryborough	Brisbane Arrivals	19	2
	QFA548	Sydney	Brisbane Arrivals	19	2
	QFA562	Sydney	Brisbane Arrivals	18	2
	QJE1550	Canberra	Brisbane Arrivals	18	2
	QLK341D	Gladstone	Brisbane Arrivals	18	2
	QLK467D	Moranbah	Brisbane Arrivals	18	2
	TGG382	Sydney	Brisbane Arrivals	18	2
				19	2
	TGG532	Melbourne	Brisbane Arrivals	18	2
	VOZ347	Melbourne	Brisbane Arrivals	19	2
	VOZ454	Darwin	Brisbane Arrivals	18	2
	VOZ616	Mackay	Brisbane Arrivals	19	2
	VOZ973	Sydney	Brisbane Arrivals	18	2
	VOZ977	Sydney	Brisbane Arrivals	19	2
	VOZ1642	Launceston	Brisbane Arrivals	18	2

Table 5: CTOT variation for Brisbane arrivals 1800-2000 local – December 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**. December performance (-0.6 minutes median and 1.1 minutes 75th percentile) met the targets. Compared to the same month last year airborne delay decreased for the median (from -0.4 minutes) and the 75th percentile was steady.

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

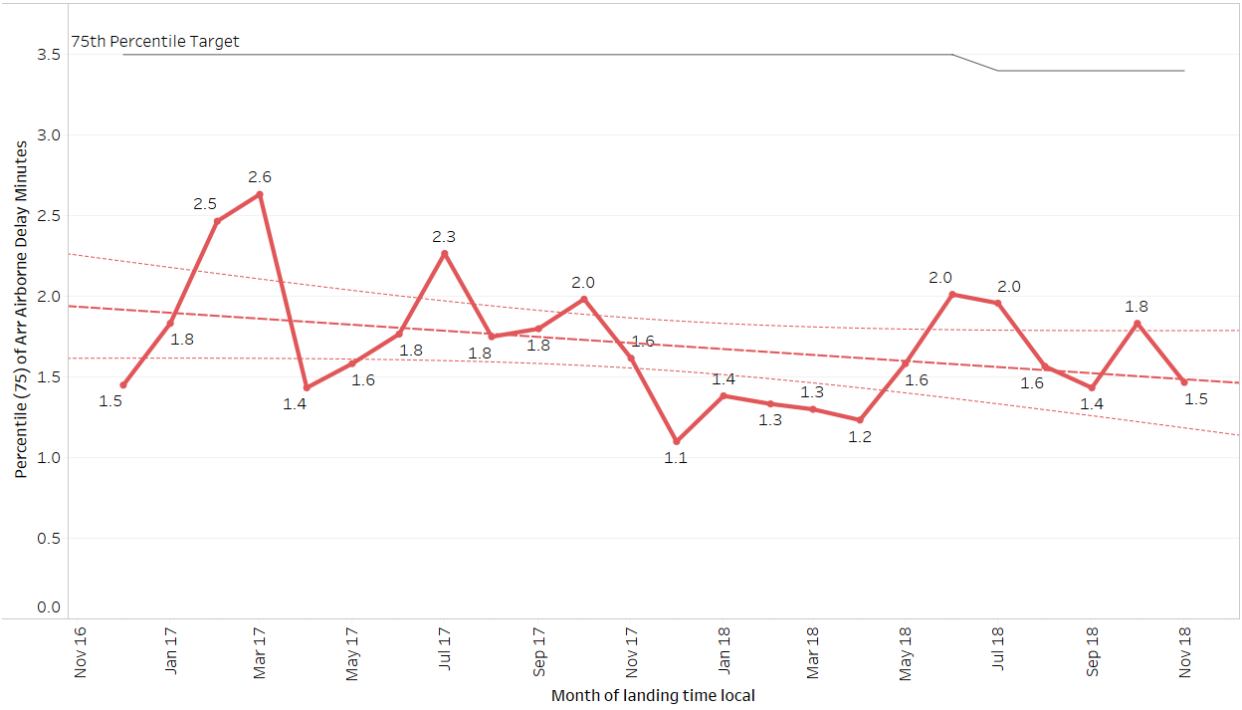

Figure 8: Perth airborne delay 75th percentile (last 24 months)

Notable events

There were no notable events in Perth in December.

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).