ATM Network Performance Report

September 2018

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Summary

This report focusses on the performance of the Air Traffic Network in September 2018. The combined 75th percentile performance during September for airborne delay across the four major airports (Sydney, Melbourne, Brisbane and Perth) was **3.4** minutes, and the median was **0.6** minutes. These results are in line with the KPI targets and represent a slight increase compared to the same period last year.

The performance for the first quarter of 2018-19 is on track to meet the median target (0.6 minutes) and is slightly above the 75th percentile target (3.5 minutes). Compared to the first quarter in 2017-18 there has been no change in the median and a slight increase in the 75th percentile (from 3.4 minutes).

There were a total of 21 notable events during September. Details of these are shown in **Figure 1** and summarised in **Table 1.** Ten 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). Eleven 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).

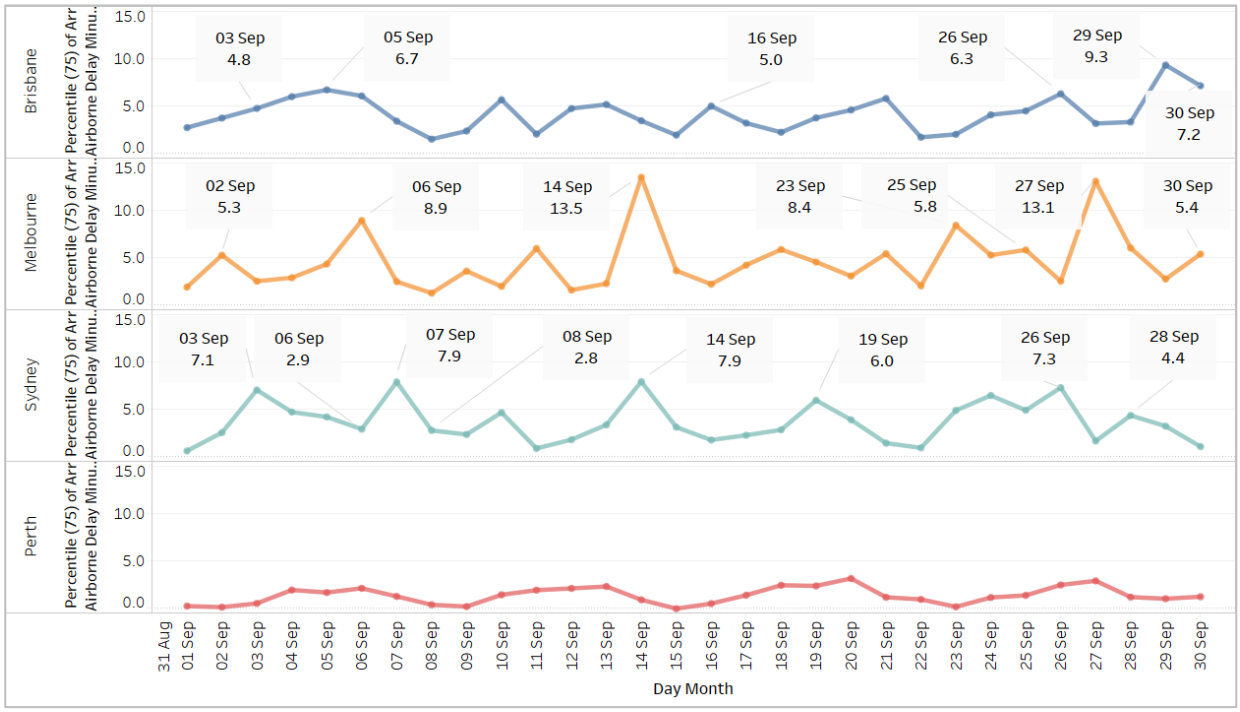

Figure 1: Notable delay impact events during September 2018

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

Location	Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
Sydney	03 September	18-19	7.1	Concentration of demand due to late arrival of several compliant aircraft during a low capacity period (tactical rates lowered due to showers).
	06 September	06-07	2.9	Decreased capacity in the early morning due to Simultaneous Opposite Direction Parallel Runway Operations (SODPROPS).
	07 September	16-20	7.9	Decreased capacity in afternoon due to multiple severe thunderstorms. Level 3 GDP Revision undertaken with 49 minutes of no arrivals.
	08 September	06-07	2.8	Concentration of demand during early morning due to off-schedule international arrivals during period of low rates due to low cloud.
	14 September	09-11	7.9	Reduced tactical rates due to unavailability of Instrument Landing System (ILS) for runway 34L.
	19 September	17-19	6.0	Decreased capacity during busy afternoon period due to single runway operations required later than planned.
	26 September	17-19	7.3	Concentration of demand due to late non-compliant and exempt flights during a busy period.
	28 September	18-19	4.4	Decreased capacity due to thunderstorms during the busy evening period. Level 2 GDP Revision with rates lowered by two arrivals per hour.
Melbourne	02 September	18-19	5.3	Concentration of demand due to late non-compliant flights during a busy period.
	06 September	16-18	8.9	Concentration of demand due to late non-compliant flights during an extended period of low capacity (single runway operations).
	14 September	17-20	13.5	Decreased capacity during busy period due to winds preventing Land and Hold Short Operations (LAHSO), resulting in decreased tactical rates and a Level 2 GDP Revision.

Melbourne	23 September	16-18	8.4	Concentration of demand due to late arrival of several compliant and non-compliant aircraft during a low capacity period (single runway operations).
	25 September	08-09	5.8	Concentration of demand due to off-schedule international arrivals during a busy period.
	27 September	16-21	13.1	Concentration of demand due to late non-compliant flights during an extended period of low capacity (single runway operations). Capacity further decreased by the earlier than forecast arrival of strong winds which prevented anticipated LAHSO at the beginning of a busy period.
	30 September	19-20	5.4	Concentration of demand due to late non-compliant flights during an extended period of low capacity (single runway operations).
Brisbane	03 September	18-19	4.8	Concentration of demand due to late and early non-compliant, and medical flights during a busy period.
	05 September	18-19	6.7	Concentration of demand due to late non-compliant and exempt flights during a busy period.
	16 September	18-19	5.0	Concentration of demand due to late international arrivals during a busy period.
	26 September	17-18	6.3	Concentration of demand due to late non-compliant and exempt flights during a busy period.
	29 September	15-18	9.3	Decreased capacity due to military aircraft displays as part of Riverfire event. No arrivals for 34 minutes.
	30 September	11-12	7.2	Decrease capacity due to unforecast thunderstorms in the morning. No arrivals for 54 minutes.

Table 1: Notable event descriptions

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.

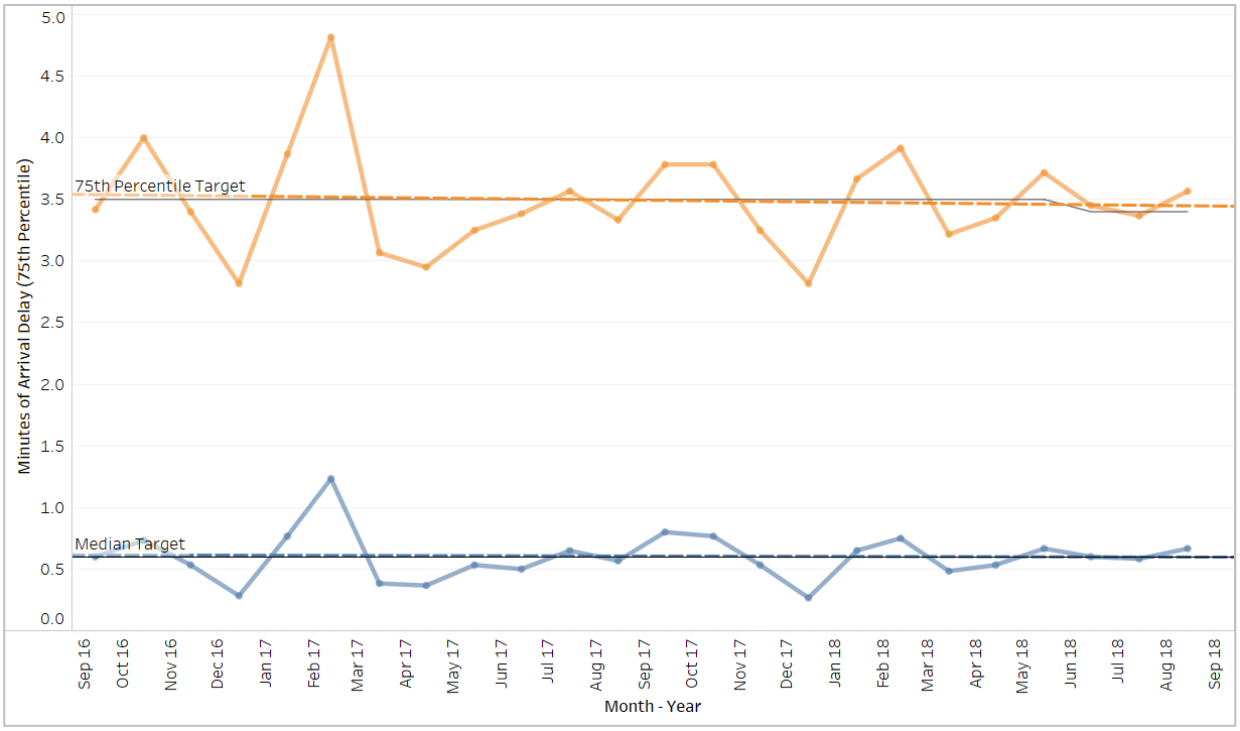

Figure 2: 24-month trend for airborne delay

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

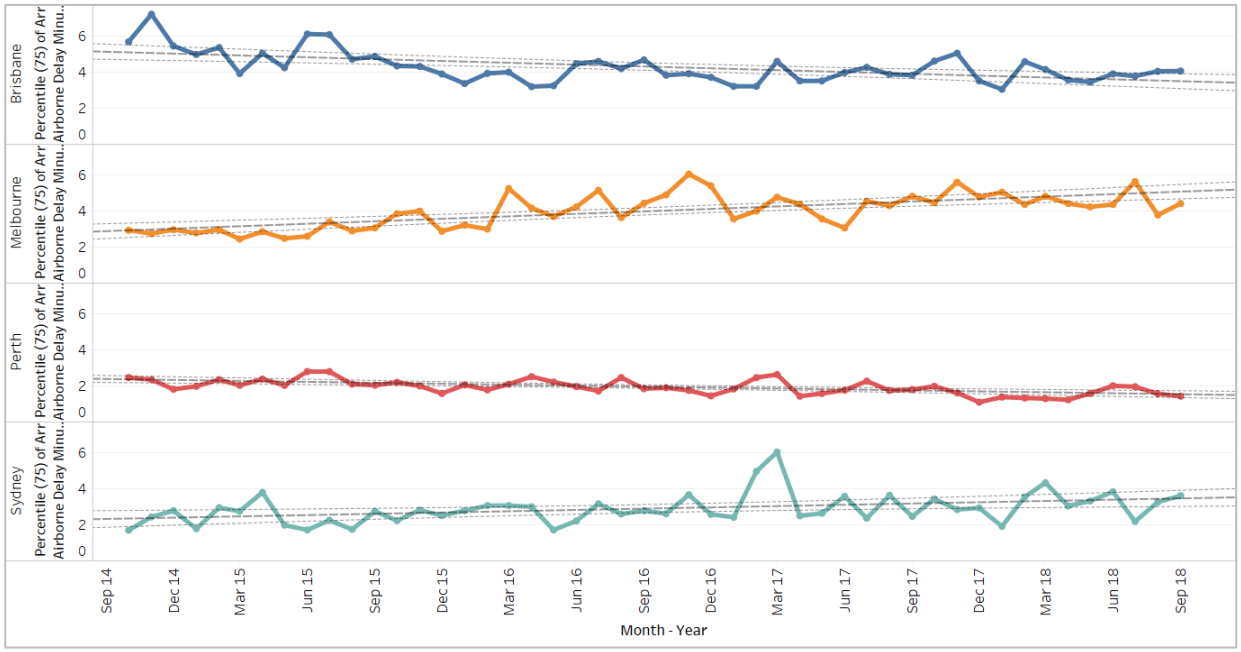

Figure 3: Long-term airborne delay (75th percentile) by airport

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. September was the fifth lowest month of adjusted total delay in the October 2017 to September 2018 period. There is no significant trend.

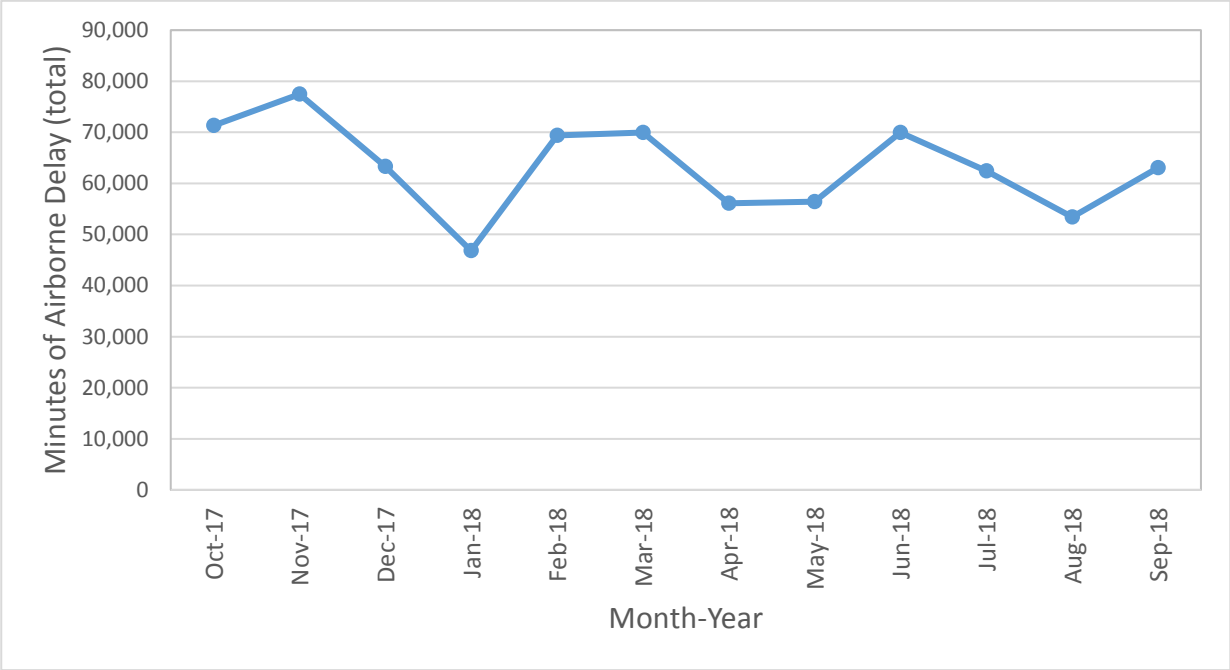

Figure 4: Total amount of airborne delay by month for Sydney, Melbourne, Brisbane and Perth Airports.

Sydney

Airborne delay

The 75th percentile performance figures for airborne delay at Sydney are indicated in **Figure 5.** September performance met the target for the median (0.5 minutes) and was above the target for the 75th percentile (3.6 minutes). Compared to the same month last year, there was an increase in the airborne delay median (from -0.1 minutes) and 75th percentile (from 2.5 minutes) performance. The long-term trend for airborne delay at Sydney is upwards. However, the 24-month trend is flat.

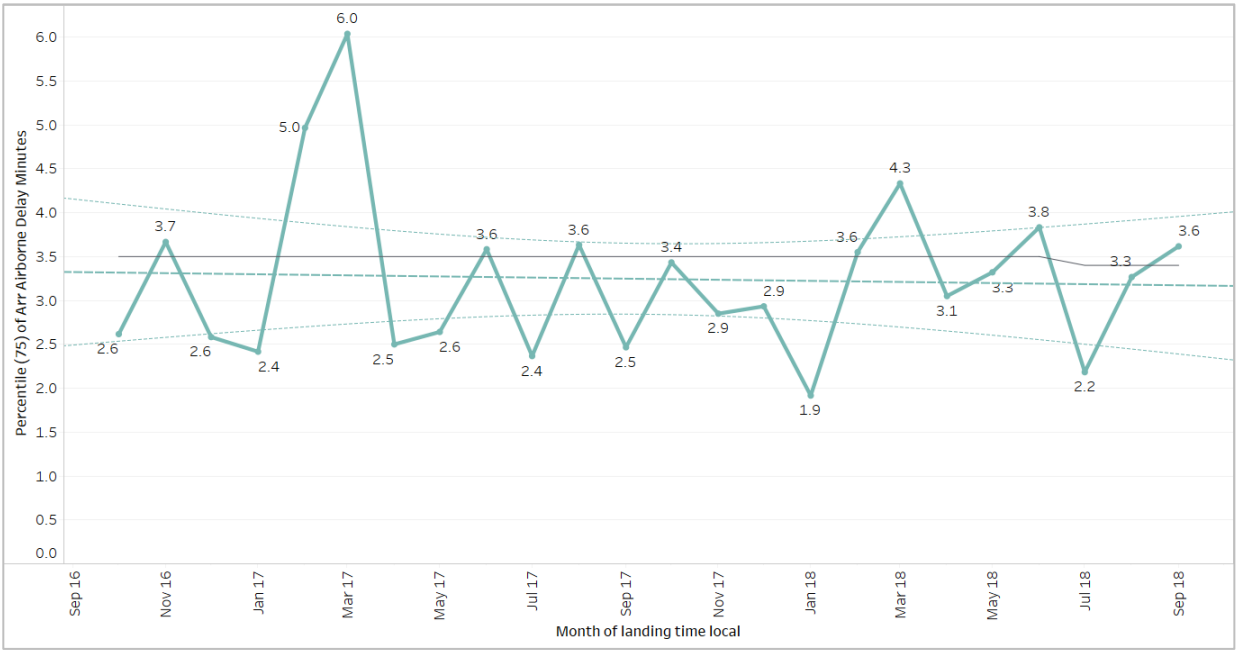

Figure 5: Sydney airborne delay 75th percentile (last 24 months)

Notable events

The following commentary describes the notable airborne delay events during September in Sydney:

- 03 September (1800-1900 local) – Delay 7.1 minutes
  - Concentration of demand due to the late arrival of several compliant aircraft during a low capacity period.
  - Decreased capacity due to lower rates for showers did not allow this concentration to be absorbed which resulted in increased airborne delay.
- 06 September (0600-0700 local) – Delay 2.9 minutes
  - Decreased capacity in the early morning due to Simultaneous Opposite Direction Parallel Runway Operations (SODPROPS).
- 07 September (1600-2000 local) – Delay 7.9 minutes
  - Decreased capacity in afternoon due to multiple severe thunderstorms.
  - Level 3 GDP Revision at 1830 local. Rate dropped to zero for 30 minutes and remained 10 to 14 lower than planned for the remainder of the evening.
  - No arrivals for 49 minutes starting at 1804 local.
- 08 September (0600-0700 local) – Delay 2.8 minutes

  - Concentration of demand during early morning due to off-schedule international arrivals.
  - Decreased capacity during this period due to tactical rates reduced for low cloud did not enable the concentration to be absorbed which resulted in increased airborne delay.
- 14 September (0900-1100 local) – Delay 7.9 minutes
  - Reduced tactical rates due to unavailability of Instrument Landing System (ILS) for runway 34L.
  - Runway configuration changed to 16 parallel to mitigate impact of ILS outage.
    - Level 2 GDP Revision conducted to increase rates from 30 to 38.
- 19 September (1700-1900 local) – Delay 6.0 minutes
  - Decrease capacity during afternoon period due to single runway operations required to continue for one hour later than planned.
- 26 September (1700-1900 local) – Delay 7.3 minutes
  - Concentration of demand due to late non-compliant and exempt flights during a busy period.
- 28 September (1800-1900 local) – Delay 4.4 minutes
  - Decreased capacity due to thunderstorms during the busy evening period.
  - Level 2 GDP Revision with rates lowered by two arrivals per hour.

Melbourne

Airborne delay

The 75th percentile performance figures for airborne delay at Melbourne are indicated in **Figure 6.** September performance (1.0 minute median and 4.4 minutes 75th percentile) did not meet the targets. Compared to the same month last year, there was a decrease in the airborne delay median (from 1.5 minutes) and 75th percentile (from 4.8 minutes) performance. The long-term trend for airborne delay at Melbourne is upwards. However, the 24-month trend is flat.

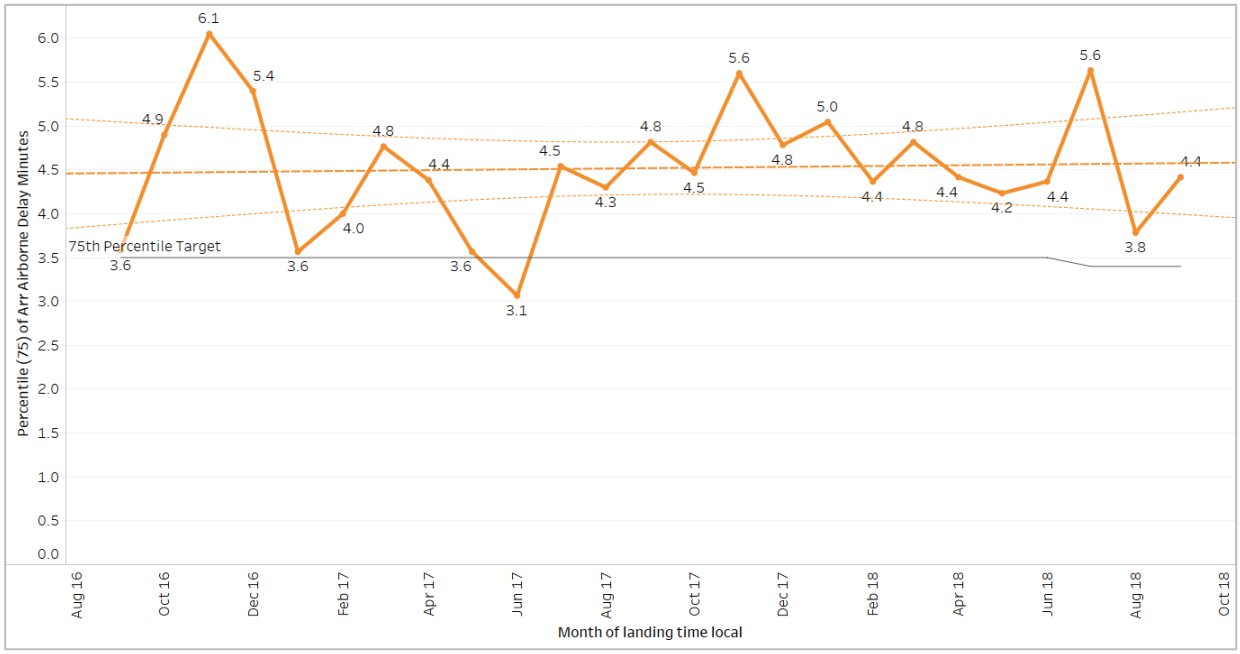

Figure 6: Melbourne airborne delay 75th percentile (last 24 months)

Notable events

The following commentary describes the most significant airborne delay events during September in Melbourne.

- 02 September (1800-1900 local) – Delay 5.3 minutes
  - Concentration of demand due to late non-compliant flights during a busy period.
- 06 September (1600-1800 local) – Delay 8.9 minutes
  - Concentration of demand due to late non-compliant flights during a busy period.
  - Decreased capacity due to an extended period of single runway operations did not allow the concentration to be absorbed which resulted in increased airborne delay.
- 14 September (1700-2000 local) – Delay 13.5 minutes
  - Decreased capacity due to winds preventing anticipated Land and Hold Short Operations (LAHSO) during busy period.
    - Tactical rates decrease by six slots an hour for two hours.
    - Level 2 GDP Revision conducted at 1845 with rate reduced by six for an additional hour.
- 23 September (1600-1800 local) – Delay 8.4 minutes
  - Concentration of demand due to late arrival of several compliant and non-compliant flights.

    - Decreased capacity due to an extended period of single runway operations did not allow the concentration to be absorbed which resulted in increased airborne delay.
- 25 September (0800-0900 local) – Delay 5.8 minutes
    - Concentration of demand due to off-schedule international arrivals during a busy period.
- 27 September (1600-2100 local) – Delay 13.1 minutes
    - Concentration of demand due to late arrival of several compliant and non-compliant flights at the beginning of a peak period.
    - Low capacity due to an extended period of single runway operations did not allow the concentration to be absorbed which resulted in increased airborne delay.
        - Capacity was further decreased by the earlier than forecast arrival of strong winds which prevented anticipated LAHSO at the beginning of a busy period.
- 30 September (1900-2000 local) – Delay 5.4 minutes
    - Concentration of demand due to late non-compliant flights during a busy period.
    - Decreased capacity due to an extended period of single runway operations did not allow the concentration to be absorbed which resulted in increased airborne delay.

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.

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	QLK286D	YMLT	Melbourne Arrivals	18	8
	QLK58D	YDPO	Melbourne Arrivals	18	6
	QLK85D	YMIA	Melbourne Arrivals	18	4
	RXA3683	YMIA	Melbourne Arrivals	19	3
	QFA1016	YMHB	Melbourne Arrivals	18	2
	RXA3772	YMTG	Melbourne Arrivals	18	2
Late	QFA839	YPDN	Melbourne Arrivals	18	10
	VOZ1333	YMHB	Melbourne Arrivals	19	5
	QFA449	Sydney Departures	Melbourne Arrivals	18	4
	QFA451	Sydney Departures	Melbourne Arrivals	18	4
	QFA455	Sydney Departures	Melbourne Arrivals	19	4
	VOZ870	Sydney Departures	Melbourne Arrivals	19	4
	QFA10	Perth Departures	Melbourne Arrivals	19	3
	QFA453	Sydney Departures	Melbourne Arrivals	19	3
	VOZ342	Brisbane Departures	Melbourne Arrivals	19	3
	VOZ858	Sydney Departures	Melbourne Arrivals	18	3
	VOZ862	Sydney Departures	Melbourne Arrivals	18	3
	VOZ866	Sydney Departures	Melbourne Arrivals	18	3
	JST477	YWLM	Melbourne Arrivals	18	2
	JST519	Sydney Departures	Melbourne Arrivals	18	2
	JST523	Sydney Departures	Melbourne Arrivals	19	2
	QFA453	Sydney Departures	Melbourne Arrivals	18	2
	QFA457	Sydney Departures	Melbourne Arrivals	19	2
	QFA469	Sydney Departures	Melbourne Arrivals	18	2
	QFA1016	YMHB	Melbourne Arrivals	18	2
	VOZ278	YSCB	Melbourne Arrivals	18	2
	VOZ874	Sydney Departures	Melbourne Arrivals	19	2

Table 3: CTOT variation for Melbourne arrivals 0700-1100 local –September 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**. September performance (1.2 minutes median and 4.1 minutes 75th percentile) did not meet the targets. Compared to the same month last year there was an increase in the median (from 1.0 minutes) and the 75th percentile (from 3.8 minutes) of airborne delay. The long-term trend for airborne delay at Brisbane is downwards. However, the 24-month trend is flat.

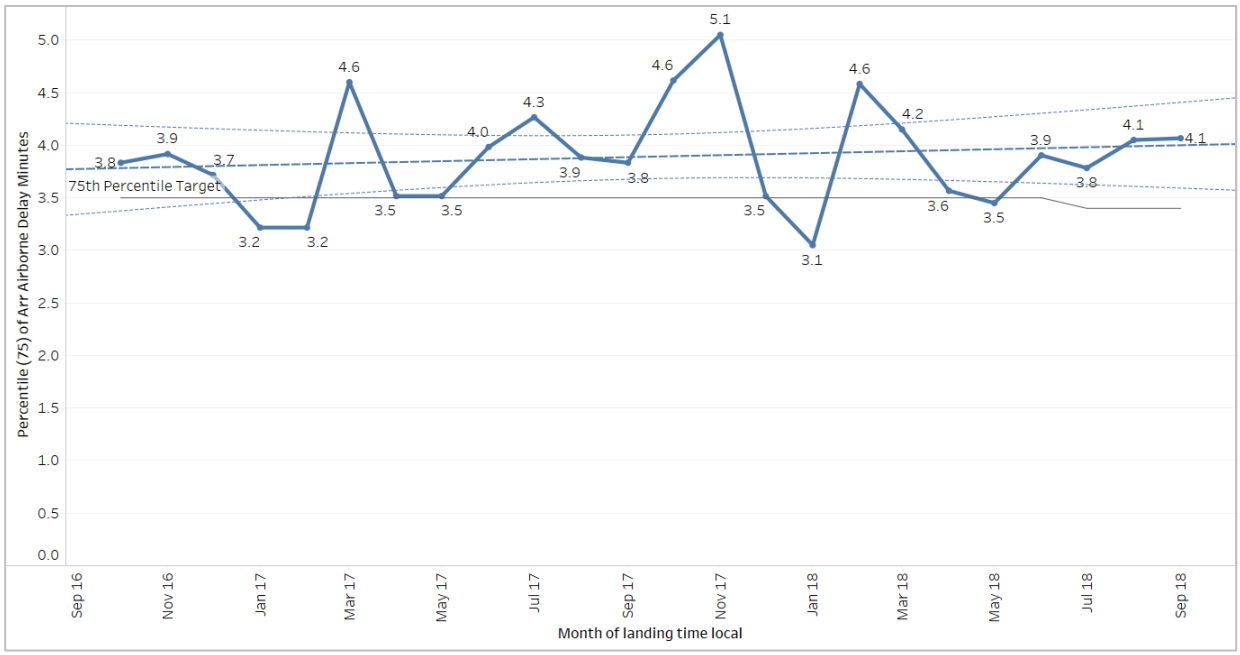

Figure 7: Brisbane airborne delay 75th percentile (last 24 months)

Notable events

The following commentary describes the most significant airborne delay events during September in Brisbane:

- 03 September (1800-1900 local) – Delay 4.8 minutes
  - Concentration of demand due to late and non-compliant flights, and medical flights during a busy period.
- 05 September (1800-1900 local) – Delay 6.7 minutes
  - Concentration of demand due to late non-compliant and exempt flights during a busy period.
- 16 September (1800-1900 local) – Delay 5.0 minutes
  - Concentration of demand due to late international arrivals during a busy period.
- 26 September (1700-1800 local) – Delay 6.3 minutes
  - Concentration of demand due to late non-compliant and exempt flights during a busy period.
- 29 September (1800-1900 local) – Delay 9.3 minutes
  - Decrease capacity due to military aircraft displays as part of Riverfire event.
    - No arrivals for 34 minutes.

- 30 September (1800-1900 local) – Delay 7.2 minutes
    - Decreased capacity due to unforecast thunderstorms in the morning.
        - No arrivals for 54 minutes.

CTOT Variation

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.

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	UJS	YMYB	Brisbane Arrivals	19	3
	QLK465D	YMRB	Brisbane Arrivals	18	2
	UJN	YMYB	Brisbane Arrivals	19	2
	VOZ1248	YBRK	Brisbane Arrivals	18	2
Late	VOZ341	Melbourne Departures	Brisbane Arrivals	19	8
	VOZ454	YPDN	Brisbane Arrivals	18	7
	QFA628	Melbourne Departures	Brisbane Arrivals	19	6
	VOZ337	Melbourne Departures	Brisbane Arrivals	18	6
	QFA544	Sydney Departures	Brisbane Arrivals	19	5
	QFA626	Melbourne Departures	Brisbane Arrivals	18	4
	UJV	YBWW	Brisbane Arrivals	19	4
	QFA975	YBTL	Brisbane Arrivals	18	3
	QFA540	Sydney Departures	Brisbane Arrivals	18	2
	QJE1598	YPAD	Brisbane Arrivals	19	2
	QLK517D	YBMK	Brisbane Arrivals	18	2
	TGG532	Melbourne Departures	Brisbane Arrivals	18	2
	VOZ454	YPDN	Brisbane Arrivals	19	2
	VOZ469	Perth Departures	Brisbane Arrivals	19	2
	VOZ965	Sydney Departures	Brisbane Arrivals	18	2
	VOZ973	Sydney Departures	Brisbane Arrivals	19	2
	VOZ1225	YSCB	Brisbane Arrivals	19	2

Table 4: CTOT variation for Brisbane arrivals 1800-2000 local September 2018. Number of occasions 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**. September performance (-0.3 minutes median and 1.4 minutes 75th percentile) met the targets. Compared to the same month last year there was a decrease in the median (from -0.1 minutes) and 75th percentile (from -0.1 minutes) of airborne delay. The long-term and 24-month trend for airborne delay at Perth is downwards.

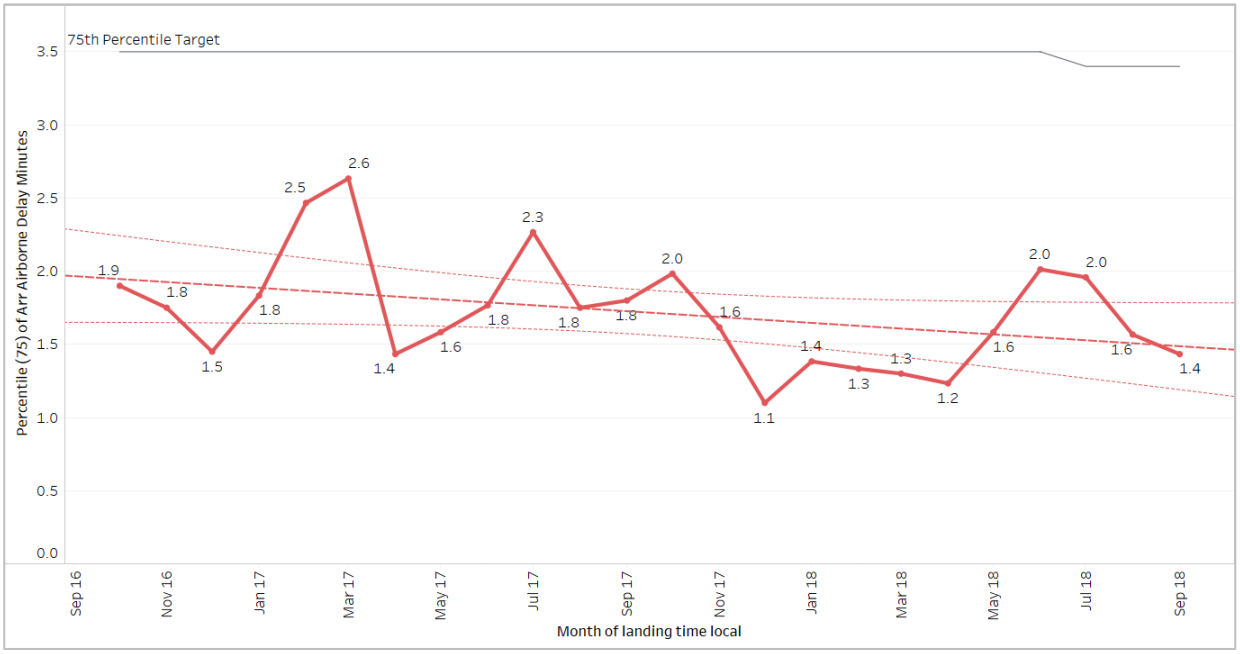

Figure 8: Perth airborne delay 75th percentile (last 24 months)

Notable events

There were no notable events at Perth during September 2018.

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).