ATM Network Performance Report

September 2019

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Summary

September Performance

Network Performance in September was affected by a high number of instances of lower capacity operations at Melbourne and Sydney in response to meteorological conditions compared to previous months. The combined 75th percentile performance during September for airborne delay across the four major airports (Sydney, Melbourne, Brisbane and Perth) was **4.6** minutes. The median airborne delay across these airports was **1.1** minutes. These results did not meet the KPI targets of 3.4 minutes and 0.5 minutes respectively. The median and 75th percentile increased compared to the same period last year.

The main contributing factors to significant delay increases experienced during September include:

- continued taxiway works on Rapid Exit Taxiway F at Melbourne Airport,
- worse than (or different to) forecast conditions, and
- single runway operations at Sydney.

The taxiway works at Melbourne airport are planned to be complete in early 2020. During this time, close monitoring of the airborne delay is being undertaken to ensure appropriate controls are in place to regulate delay. This includes offering revisions to the Ground Delay Program (GDP) through a Collaborative Decision Making (CDM) process with our airline customers. The result of this CDM process can be a higher appetite for airborne delay by airlines in favour of decreased gate holding, which explains some of the observed increase in airborne delay.

There were 36 notable events in September, which was two lower than in August (but still equal to the highest seen in the previous FY). This month there were sixteen notable events in Sydney, thirteen in Melbourne, six in Brisbane and one in Perth.

The 36 notable events in September 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. Seventeen 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).

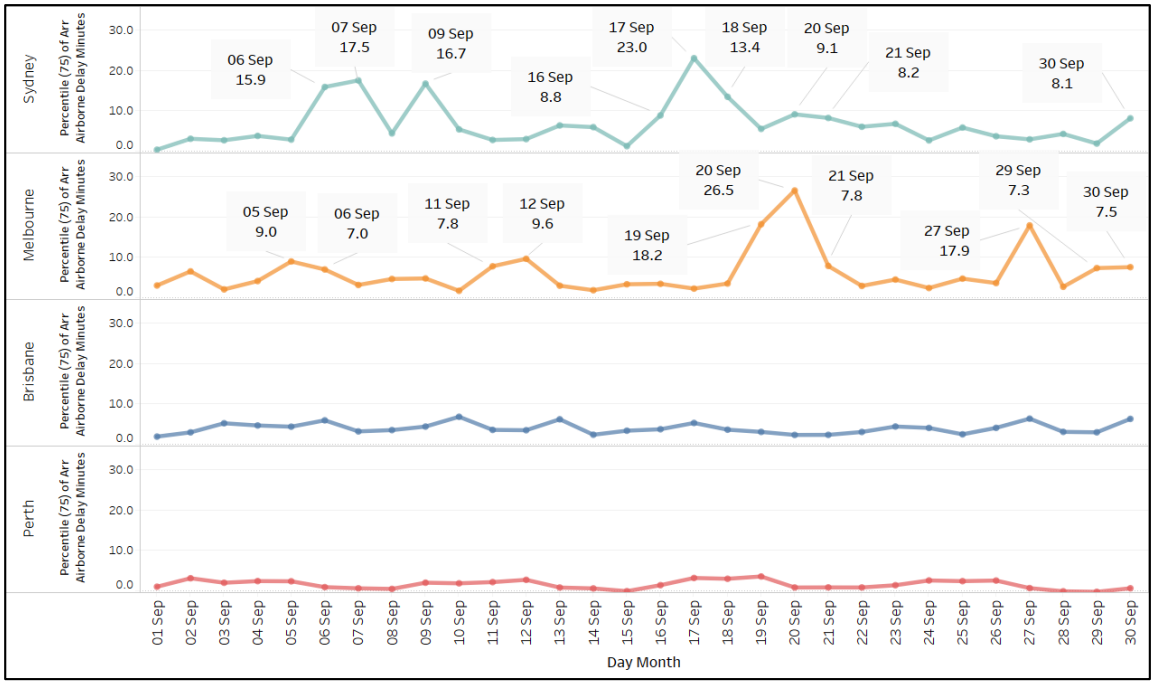

Figure 1: Notable prolonged delay impact events during September 2019
Numbers underneath the dates indicate the extent of the 75th percentile of airborne delay in minutes across the day.

Network Wide Performance

Airborne delay

The 24-month combined median and 75th percentile airborne delay at the four major airports is indicated in **Figure 2**. The trends are upward for both measures.

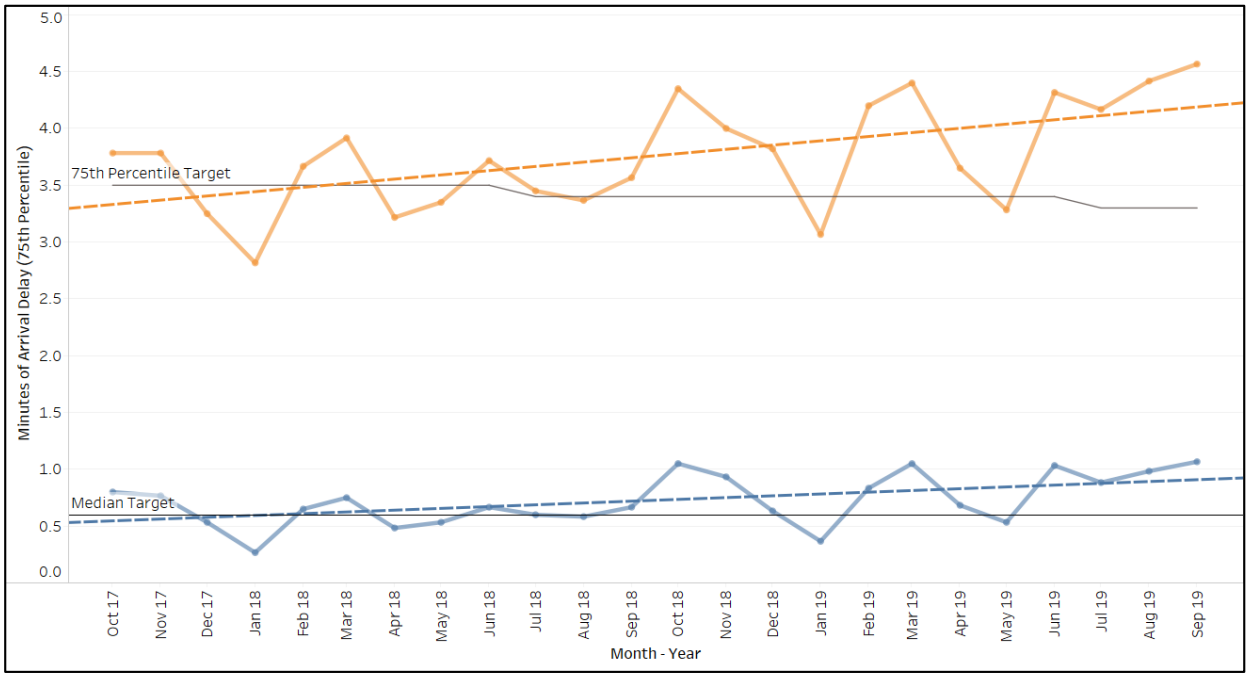

Figure 2: 24-month trend for airborne delay

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.

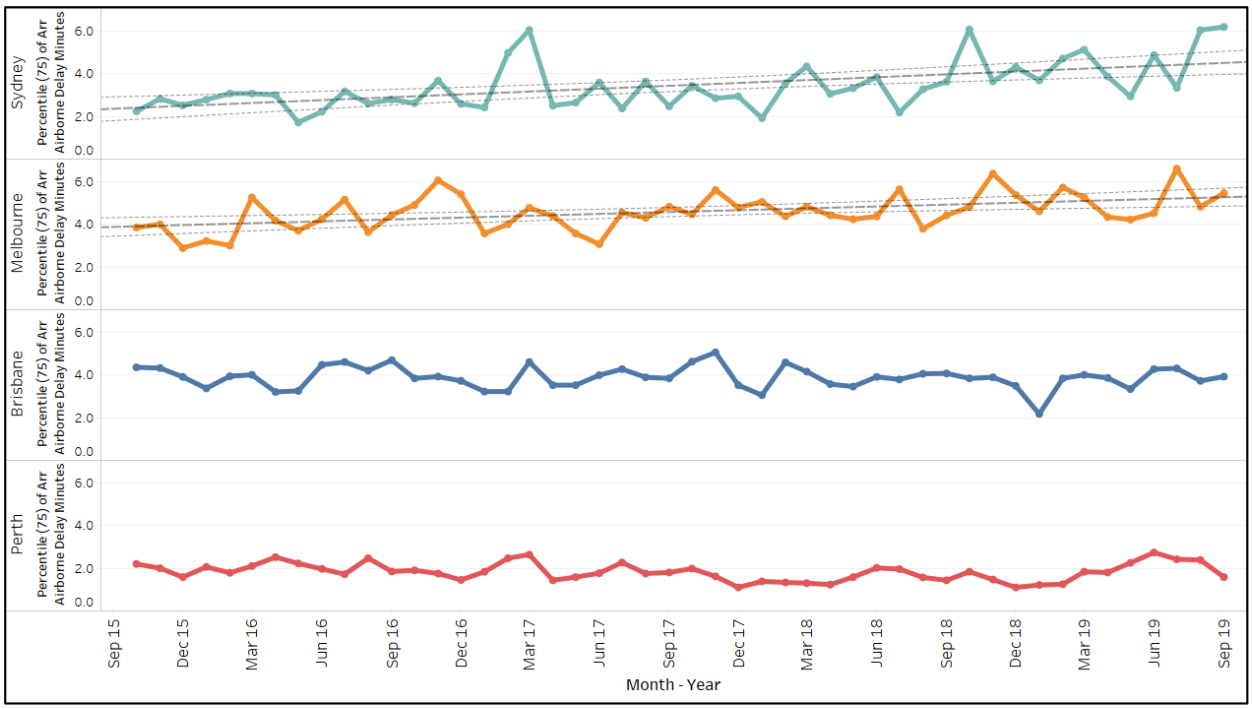

Figure 3: 48-month trend for airborne delay (75th percentile) by airport

Runway configuration

The runway configuration usage for each airport is shown in **Figure 5**. In Melbourne the availability of Land and Hold Short Operations (LAHSO) increased by around 5% compared to the same month last year (55 hours compared to 52 hours in September 2018). Single runway usage decreased by 11% (202 hours compared to 227 hours in September 2018). The use of Runway 34 for arrivals (single runway 34 and LAHSO operations) decreased by 6% (to 161 hours) compared to August (171 hours).

In Sydney the use of parallel 34 runway operations decreased by 7% compared to the same month last year (215 hours compared to 232 hours in September 2018). Additionally, the use of parallel 16 operations increased by 2% compared to the same month last year (258 hours compared to 254 hours in September 2018). The overall single runway usage (runway 07/25 and SODPROPS) increased by only 14 hours compared to the same month last year, with the use of single runway 25 increasing by 188% (23 hours compared to 8 hours in September 2018). The use of Runway 25 decreased from August 2019 (68 hours). Extended use of runway 25 only is dictated by weather conditions, as opposed to SODPROPS which is generally used in low demand periods for noise sharing purposes.

Brisbane had single runway operations for 94% of the time for September in 2018 and 88% of the time in September 2019. Single runway 01 operations increased by 21% compared to the same month last year (282 hours compared to 233 hours in September 2018). Single runway 19 operations decreased by 32% (167 hours compared to 245 in September 2018). The use of two runways for arrival in Brisbane almost doubled compared to the same month last year (61 hours compared to 32 hours in September 2018). In September 2018 and 2019 the more common configuration was runways 01 and 14 for arrival, with Runway 01 for departure.

Perth was required to use single runway operations for 42% of the time in September 2019. Single runway operations are 1% lower compared to the same month last year (202 hours compared to 204 hours in September 2018). Changes to reporting at Perth now captures weekend operating configurations which are creating artefact changes to year on year differences (September 2018 had 336 hours, compared to September 2019 having 480 hours of recorded runway usage). Typically weekends at Perth have low traffic volumes which favour single runway configurations.

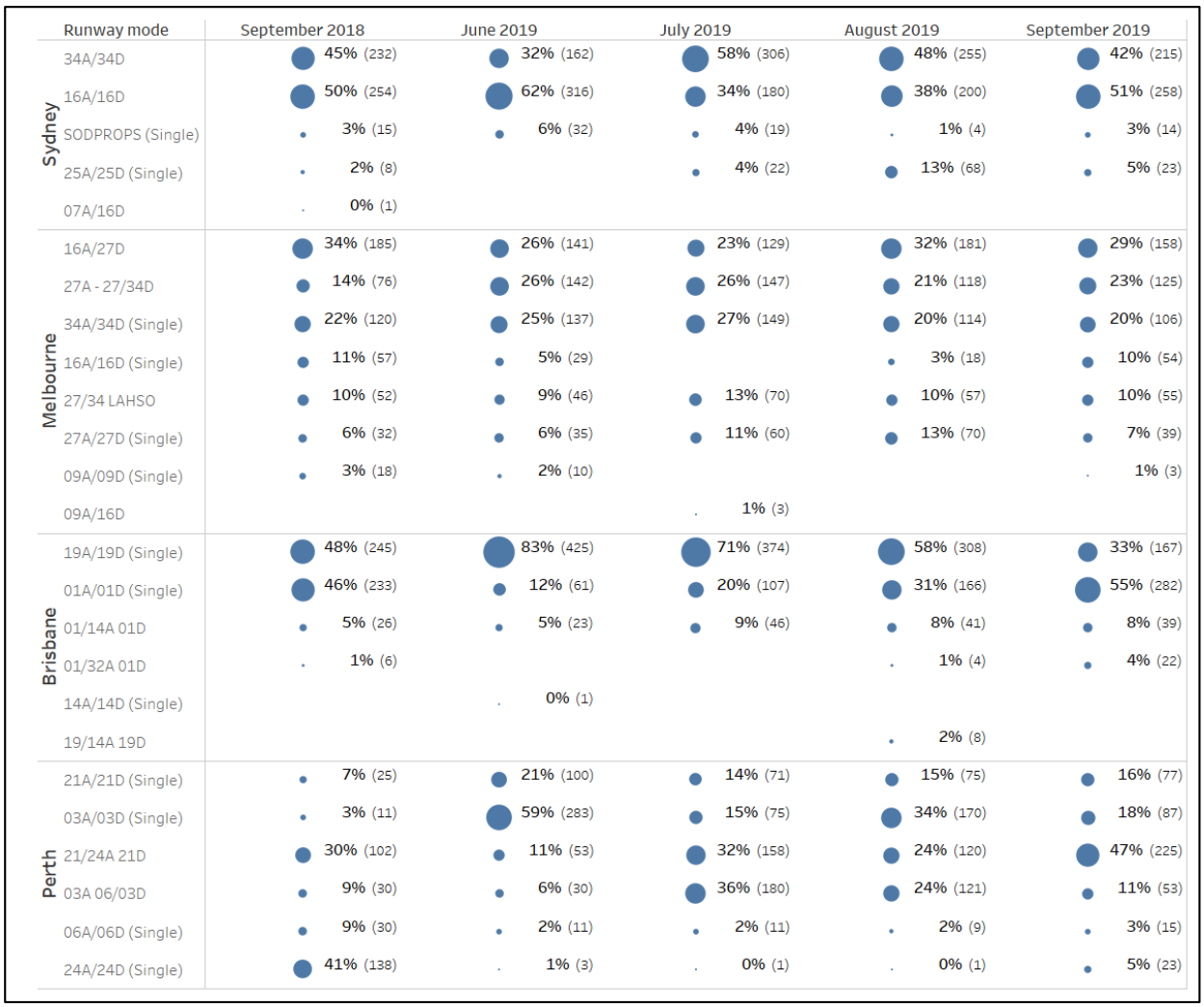

Figure 5: September runway configuration usage (percentage of total and hours in brackets) by airport (Sydney 06-22L, Melbourne 06-23L, Brisbane 06-22L and Perth 06-21L). Single runway configurations indicated in parentheses. Note: Sydney runway mode selection takes into account the Long Term Operating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

Traffic levels and composition changes

Figure 6 shows traffic levels and composition changes since the beginning of 2017.

Comparing overall traffic levels in September 2019 to September 2018, Melbourne (-0.2%) has decreased, while Sydney (0.5%), Brisbane (3.6%) and Perth (4.3%) have increased. International traffic numbers decreased in Melbourne (-3.7%) and Perth (-0.8%), while Sydney (0.7%) and Brisbane (2.6%) showed an increase.

In Sydney the domestic traffic comparison between months in 2018 and 2019 fluctuates (September 2019 is slightly up on September 2018). The general increase of international traffic in 2018 has levelled off in 2019. Traffic in Melbourne for 2019 is fairly steady compared to the previous year, with the strong growth of international traffic in 2018 no longer seen. In 2018 Brisbane traffic generally showed a decrease compared to the same month in the previous year, but with growth in international traffic. For 2019 traffic is increasing, driven by domestic traffic, as international growth has slowed. Perth traffic levels were relatively stable in 2018, while 2019 has shown overall growth driven by domestic traffic (with a drop in the international component).

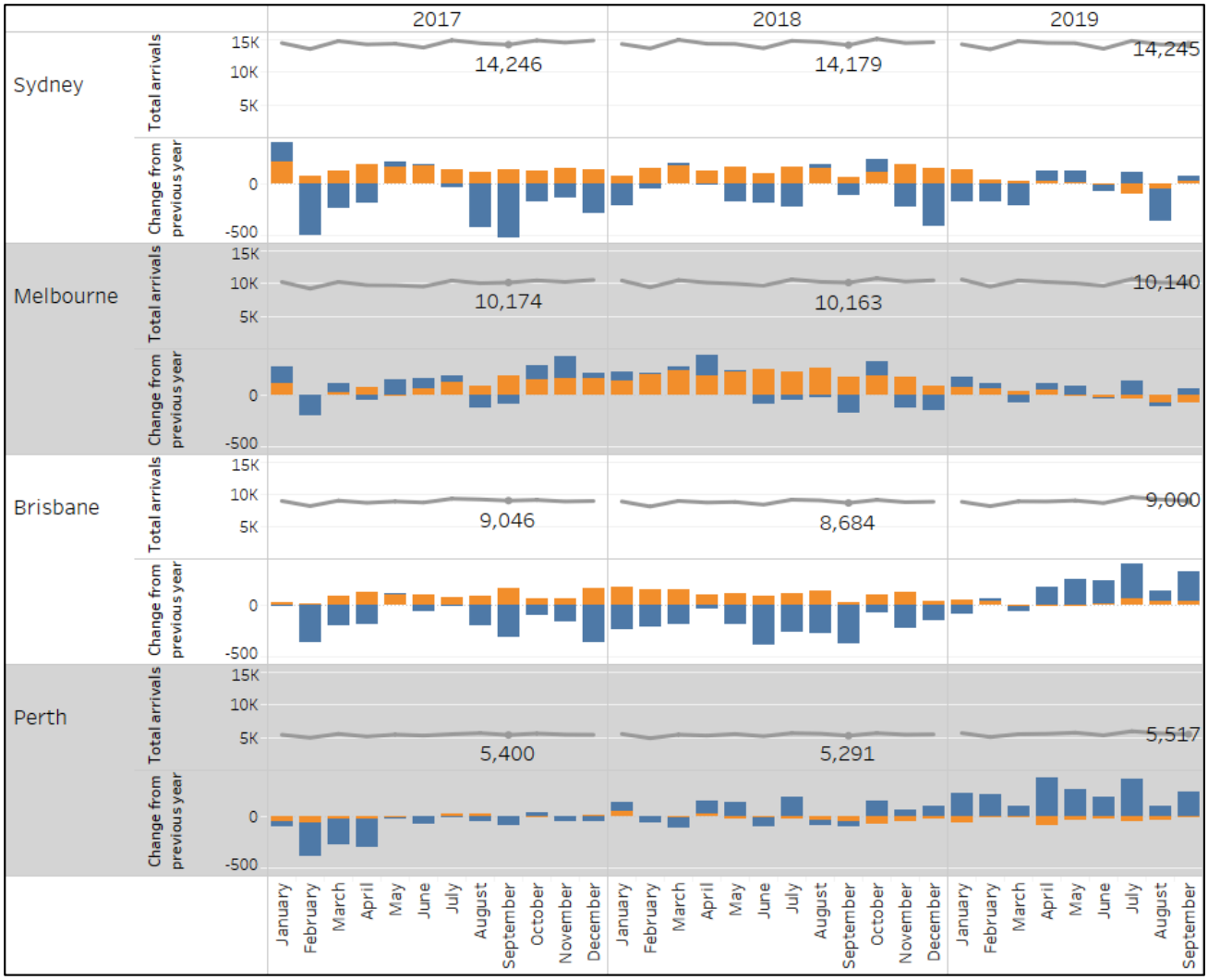

Figure 6: Traffic levels and composition change since January 2017. Grey lines show overall traffic numbers (annotated figures compare current month to same month one and two years earlier). Coloured bars show change in traffic compared to the same month the previous year for domestic (blue) and international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

Demand and capacity

Figure 7 details estimates of the number of hours each month where scheduled 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 and upward in Perth.

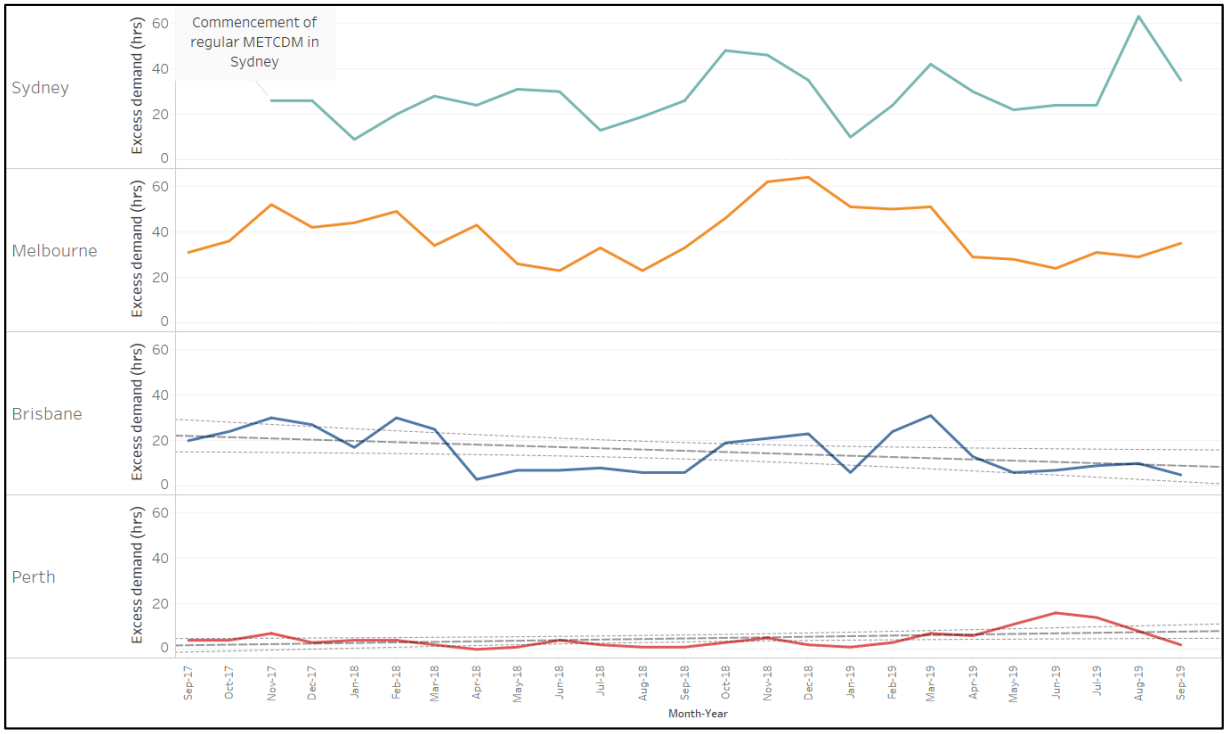

Figure 7: Excess demand estimates. Line indicates number of hours where estimated demand exceeds the METCDM rate for that hour by three or more flights. Demand is estimated using Harmony Base Estimated Landing Time.

Sydney

Airborne delay

The 75th percentile performance figures for airborne delay at Sydney are indicated in **Figure 8.** September performance for the median (1.4 minutes) and the 75th percentile (6.2 minutes) did not meet the targets (0.5 minutes and 3.4 minutes respectively). Compared to the same month last year, there was an increase in the airborne delay performance for the median (from 0.5 minutes) and 75th percentile (from 3.6 minutes).

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

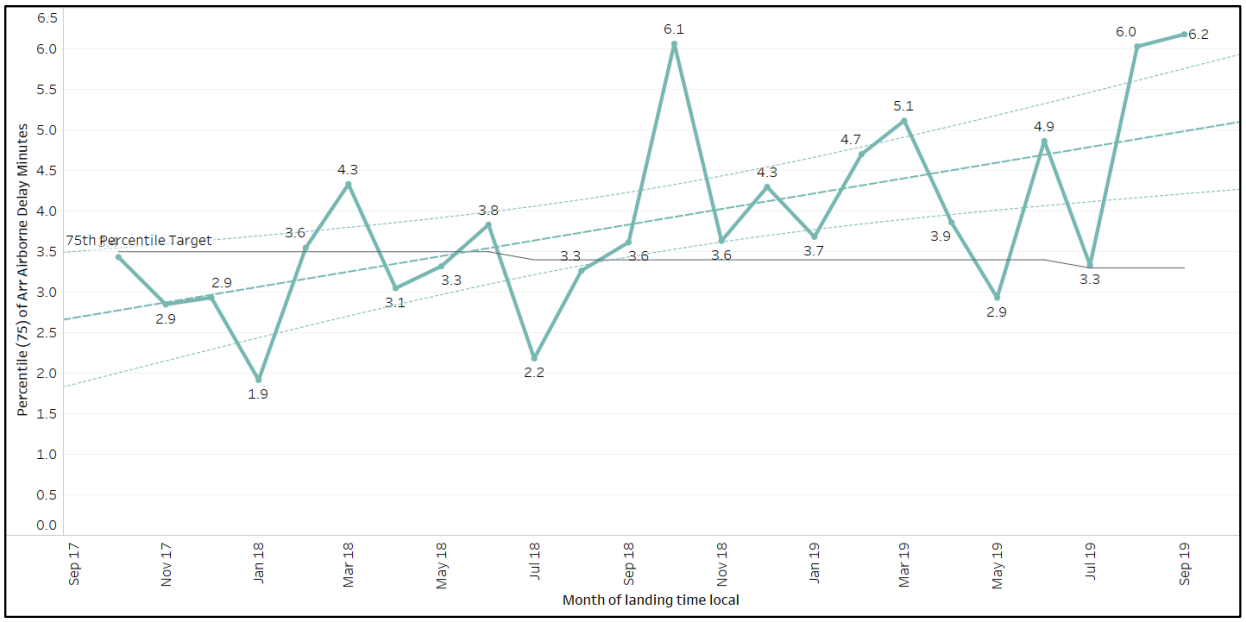

Figure 8: Sydney airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
5 September	05-07	2.8	Concentration of demand due to off-schedule internationals.
6 September	07-09 & 18-22	15.9	Morning: Tactical rates reduced from plan due to low cloud. Afternoon: Concentration of demand due to off-schedule internationals and non-compliant flights during extended period of planned single runway operations, compounded by further reduced tactical rates due to strong winds.
7 September	09-19	17.5	Extended period of planned single runway operations with strong and varying winds. Some concentration of demand due to off-schedule internationals and non-compliant flights.

8 September	08-10	4.4	Concentration of demand due to off-schedule internationals and non-compliant flights during extended period of planned single runway operations with strong winds. Level 1 revision performed at 1215 local to increase tactical rates for the afternoon.
9 September	08-11 & 17-20	16.7	Morning: Extended period of planned single runway operations, further reduction in tactical rates due to strong winds, wind shear and showers. Some concentration of demand due to off-schedule internationals and non-compliant flights. Afternoon: Diversions in circuit due turbulence and winds. Concentration of demand due to off-schedule internationals and non-compliant flights.
10 September	08-09	5.4	Strong headwinds on final reduced tactical rates. Concentration of demand due to off-schedule internationals. Two medical emergencies also sequenced during this period
13 September	07-10	6.4	Reduced tactical rates to manage breaks for PRM staff. Concentration of demand due to off-schedule internationals.
14 September	07-09	5.9	Management of late notice unavailability of tower staff member required lowering of tactical rates. Low cloud conditions. Concentration of demand due to off-schedule internationals.
16 September	17-20	8.8	Weather caused diversions in the TMA and led to a reduction in the tactical arrival rate.
17 September	06-10 & 17-21	23.0	Morning: Strong head winds on final and poor visibility led to a reduction in the tactical rate. Weather diversions in the circuit plus an emergency flight also led to increases in delays experienced. Afternoon: Strong head winds on final led to a reduction in the tactical rate and consequential elevated delays.
18 September	06-10 & 18-19	13.4	Morning: Level 2 revision due to worse than forecast conditions at 0745 local. Multiple go-arounds, strong winds and low cloud, concentration of demand due to off-schedule internationals. Afternoon: Level 1 revision due to worse than forecast conditions at 1600 local, low cloud and showers with weather diversions. Concentration of demand due to off-schedule internationals and non-compliant flights.
20 September	18-20	9.1	Lower than forecast cloud was experienced with substantial reductions in the tactical rate. Similar conditions were experience in Melbourne which had a consequential impact on returning flights.
21 September	06-07 & 13-14	8.2	Morning: Flights due to land prior to curfew end absorbed delay. Concentration of demand due to off-schedule internationals. Afternoon: low cloud, showers and winds.

23 September	17-19	6.8	Emergency flight, strong and gusty winds. Level 2 revision due to weather conditions different to forecast to provide single runway rates at 1710 local.
27 September	05-08	2.9	Flights due to land prior to curfew end absorbed delay. Concentration of demand due to off-schedule internationals and late departures out of Melbourne.
30 September	06-08 & 18-19	8.1	Morning: Flights due to land prior to curfew end absorbed delay. Concentration of demand due to off-schedule internationals. Afternoon: lower cloud than forecast, concentration of demand due to non-compliant flights.

Table 2: Notable event descriptions for Sydney.

CTOT variations

Variations from CTOT at Sydney from 0600-2300 local are the focus of this section due to notable events evident at almost any time of day at some point during the month. **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	4
	QFA829	Darwin	6	3
	RXA333	YGFN	18	3
	RXA454	Griffith	8	3
	JST746	Launceston	12	2
	PE724	YTRE	16	2
	QLK47D	Dubbo	18	2
	QLK101D	YCFS	7	2
	QLK175D	YPMQ	18	2
	QLK181	YMOR	10	2
	QLK202D	Albury	7	2
	QLK220D	Wagga	7	2
	QLK261	YLHI	16	2
	RXA114	YMRY	8	2
	RXA311	YGFN	9	2
	RXA953	YARM	7	2
	VOZ1148	YSTW	7	2
Late	VOZ859	Melbourne	17	7
	JST506	Melbourne	11	5
	TGG377	Brisbane	16	5
	VOZ853	Melbourne	16	5
	VOZ1354	Darwin	19	5

Table 3: CTOT variation for Sydney arrivals 0600-2300 local – September 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.** September performance for the median (1.5 minutes) and the 75th percentile (5.5 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 1.0 minutes) and 75th percentile (from 4.4 minutes)

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

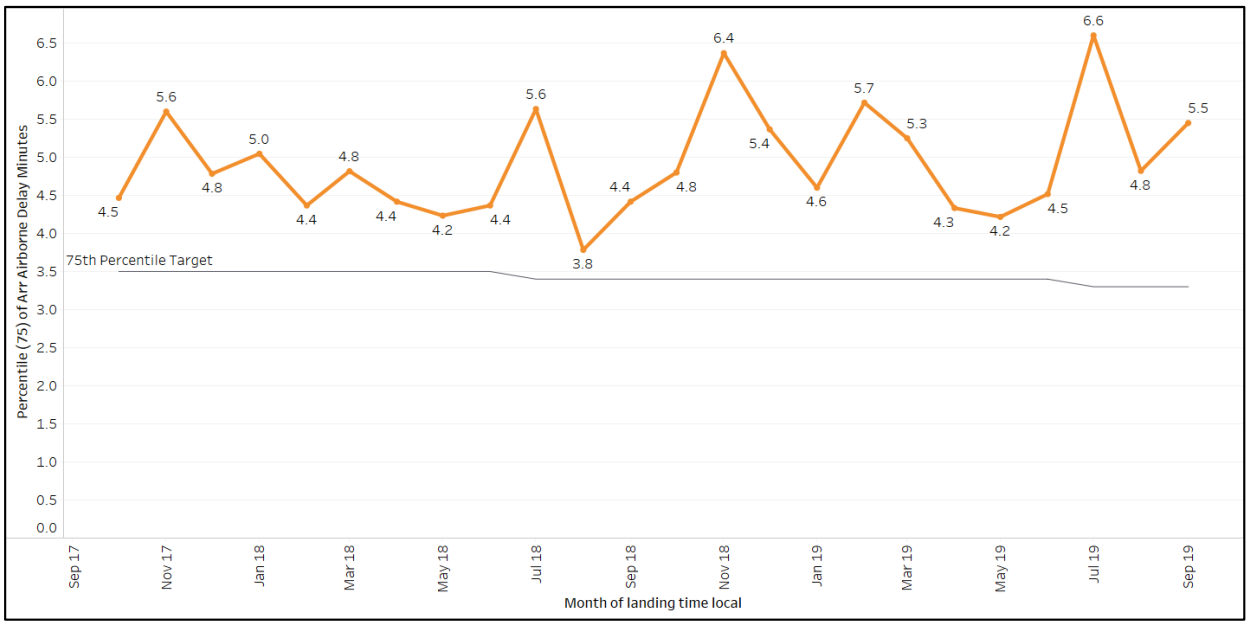

Figure 9: Melbourne airborne delay 75th percentile (last 24 months)

Notable events

Table 4 describes the notable airborne delay events during September in Melbourne. Any delay figures marked with an asterisk in the table indicates that the arrival rate reduction required for the Rapid Exit Taxiway F works was a contributing factor to the delay event. Eight of the thirteen events had the taxiway works as a contributing factor. Collaborative decision making with our airline customers about the impact of these works on network performance has resulted in an increased tolerance for Airborne Delay for arrivals into Melbourne rather taking higher levels of ground holding. The works are anticipated to be completed in early 2020 with a break over the Christmas period to avoid disruption during the busy holiday period. Co-ordination group meetings with airlines and airports decided to monitor the situation each month to determine if any further controlling actions are required to manage delay. GDP intervention to reduce airborne delays by absorbing more gate delay was offered, and through a collaborative process not implemented on two days (September 11 and 20), with a decision to accept the elevated airborne delay.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
2 September	19-20	6.5 *	Extended period of unplanned single runway operations.
4 September	18-19	4.1	Forecast showers and low cloud. Concentration of demand due to non-compliant flights.
5 September	16-18	9.0 *	Extended period of planned single runway operations. Forecast showers and low cloud. Concentration of demand due to non-compliant flights.
6 September	18-20	7.0	Winds, conditions different to forecast leading to single runway operations.
11 September	18-20	7.8 *	Variable conditions led to an extended period of unplanned single runway operations.
12 September	08-09	9.6 *	Extended period of planned single runway operations. Concentration of demand due to off-schedule internationals.
19 September	08-10 & 17-23	18.2 *	Morning: Extended period of planned single runway operations with strong and gusty winds. Afternoon: Extended period of planned single runway operations with strong and gusty winds. Concentration of demand due to non-compliant flights.
20 September	07-22	26.5 *	Extended period of planned single runway operations with turbulence, strong and gusty winds. Concentration of demand due to non-compliant flights.
21 September	11-12 & 15-16	7.8 *	Morning: Extended period of planned single runway operations with showers. Afternoon: conditions different to forecast leading to continued use of runway 34. Extended period of planned single runway operations with showers.
25 September	18-19	4.7	Concentration of demand due to non-compliant flights.
27 September	08-12 & 17-20	17.9 *	Morning: Extended period of planned single runway operations. Afternoon: Concentration of demand due to knock-on of earlier delays and non-compliant flights.

29 September	-	7.3	Concentration of demand due to non-compliant flights. Showers and low cloud.
30 September	18-20	7.5	Concentration of demand due to non-compliant flights.

Table 4: Notable event descriptions for Melbourne.

CTOT variations

Variations from CTOT at Melbourne from 0600-2300 local are the focus of this section due to notable events evident at almost any time of day at some point during the month. **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	RXA3752	Mount Gambier	8	5
	JST437	Gold Coast	16	3
	QLK282D	Launceston	11	3
	QLK286D	Launceston	18	3
	JST831	Proserpine	13	2
	QFA797	YBAS	15	2
	QLK50D	Devonport	7	2
	QLK280D	Launceston	7	2
	RXA3493	Merimbula	18	2
	RXA3653	Mildura	7	2
	RXA3685	Mildura	19	2
	RXA3772	Mount Gambier	18	2
	TFR22	Sydney	23	2
	TGG213	Sydney	8	2
	VOZ740	Gold Coast	16	2
	VOZ1371	Launceston	17	2
	VOZ1594	Williamtown	16	2
Late	QFA445	Sydney	17	10
	QFA421	Sydney	11	8
	VOZ318	Brisbane	11	8
	JST477	Williamtown	16	7
	JST702	Hobart	17	7
	QFA417	Sydney	10	7
	QFA467	Sydney	21	7
	TGG263	Sydney	19	7
	VOZ1508	YBSU	15	7
	JST471	Williamtown	20	6
	JST515	Sydney	16	6
	JST517	Sydney	19	6
	QFA479	Sydney	20	6
	QFA839	Darwin	17	6
	TGG585	Cairns	15	6
	VOZ870	Sydney	19	6
	VOZ882	Sydney	20	6
	JST439	Gold Coast	17	5
	JST677	Darwin	6	5
	JST712	Hobart	16	5
	JST793	YBSU	12	5
	QFA427	Sydney	12	5
	QFA439	Sydney	15	5
	QFA443	Sydney	16	5
	QFA491	Sydney	22	5
	TGG279	Sydney	22	5
	VOZ328	Brisbane	15	5
	VOZ738	Gold Coast	14	5
	VOZ834	Sydney	12	5
	VOZ838	Sydney	13	5
	VOZ872	Sydney	19	5
	VOZ1294	Cairns	16	5
	VOZ1594	Williamtown	16	5

Table 5: CTOT variation for Melbourne arrivals 0600-2300 local – September 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**. September performance did not meet the target for the median (1.3 minutes) or the 75th percentile (3.9 minutes). Compared to the same month last year, there was an increase in the airborne delay median performance (from 1.2 minutes) and a decrease in the 75th percentile (from 4.1 minutes).

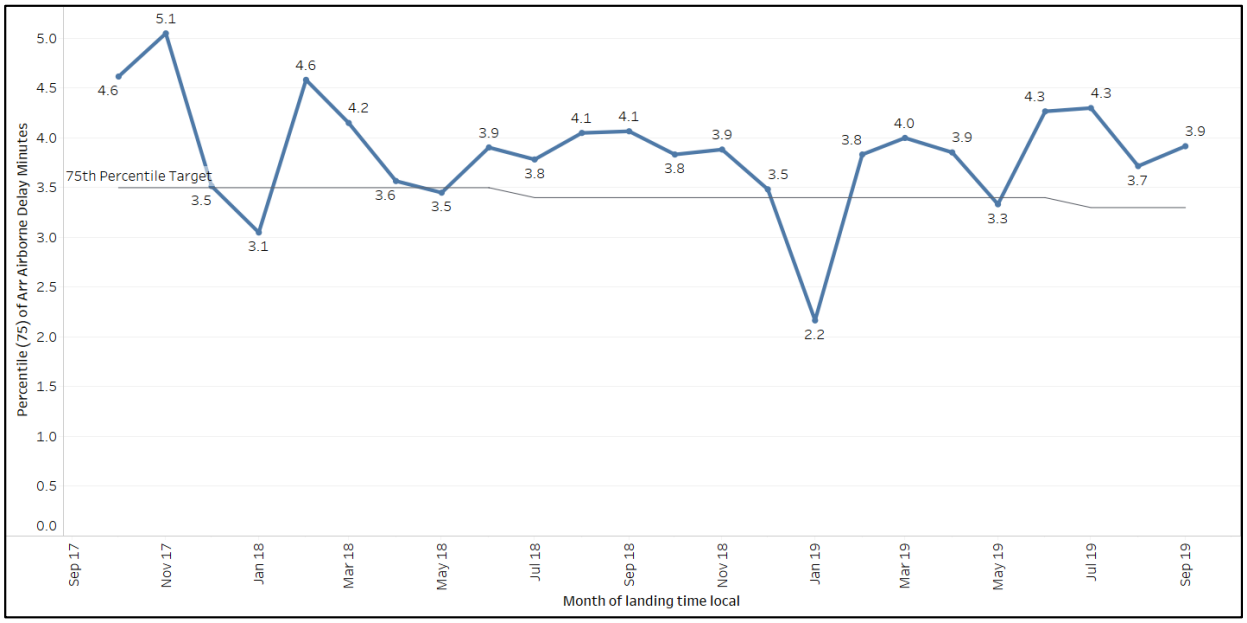

Figure 10: Brisbane airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
5 September	19-20	4.3	No GDP. Period of planned single runway operations with winds.
10 September	18-19	6.8	Period of planned single runway operations with turbulence and uncertain wind direction.
17 September	17-19	5.3	Forecast thunderstorm. Concentration of demand due to off-schedule internationals and non-compliant flights.
26 September	19-20	4.0	Period of planned single runway operations. Concentration of demand due to off-schedule internationals and non-compliant flights.

28 September	16-17	3.0	Forecast thunderstorm. Riverfire displays. Concentration of demand due to off-schedule internationals and non-compliant flights.
30 September	08-09	6.3	Reduced visibility lowered tactical Rates longer than planned.

Table 6: Notable event descriptions for Brisbane.

CTOT variations

Variations from CTOT at Brisbane from 0600-2300 local are the focus of this section to be consistent with Sydney and Melbourne which each had notable events at various time periods across the day. **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	5
	JST826	Sydney	15	3
	JST833	Proserpine	19	2
	SKP738	YCCA	15	2
	TFX133	Rockhampton	21	2
	VEB	Dubbo	12	2
	VOZ973	Sydney	19	2
Late	JST818	Sydney	20	7
	JST576	Melbourne	20	6
	QFA624	Melbourne	17	6
	QFA628	Melbourne	19	6
	VOZ705	Hobart	16	6
	QFA634	Melbourne	21	5
	QFA636	Melbourne	22	5
	QFA825	Darwin	17	5
	VOZ333	Melbourne	17	5
	VOZ341	Melbourne	19	5

Table 7: CTOT variation for Brisbane arrivals 0600-2300 local – September 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**. September performance for the median (-0.3 minutes) and the 75th percentile (1.6 minutes) met the targets. Compared to the same month last year, there was no change in the airborne delay median performance (from -0.3 minutes) and an increase in 75th percentile performance (from 1.4 minutes).

The 24-month trend for airborne delay at Perth is upwards.

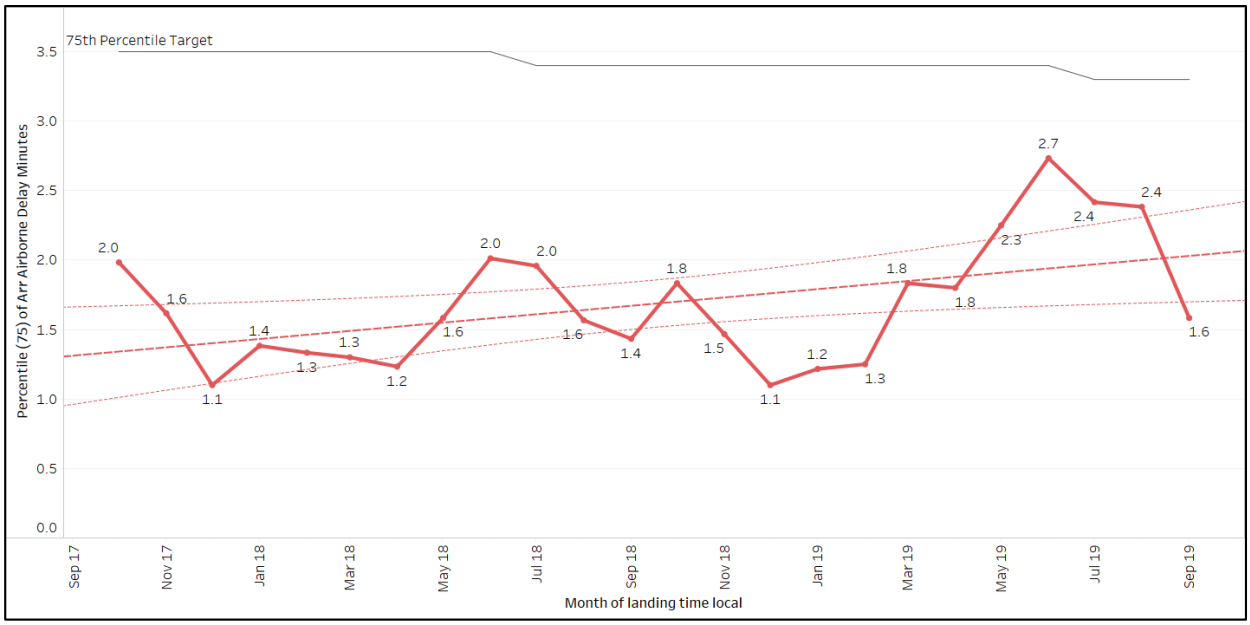

Figure 11: Perth airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
12 September	10-11	2.7	Concentration of demand due to 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).