ATM Network Performance Report

February 2019

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Summary

This report focusses on the performance of the Air Traffic Network in February 2019. The combined 75th percentile performance during February for airborne delay across the four major airports (Sydney, Melbourne, Brisbane and Perth) was **4.2** minutes. The median airborne delay across these airports was **0.8** minutes. These results did not meet the KPI targets and increased compared to the same period last year.

The airborne delay outcomes for February were the second highest (75th-percentile) and third highest (median) observed in FY 2019. This was a result of the high number of notable events during February (34 – highest for FY 2019). Seventeen of these events took place in Melbourne, and thirteen in Sydney. There were no notable events in Perth and only four in Brisbane, as a result of relatively favourable weather conditions at these locations.

While the overall number of notable events in February was high, there were no days where arrival airborne delay exceeded 20 minutes (75th percentile), while there were three such days in January where this occurred. The most disruptive event in Sydney was on February 8, when thunderstorm activity led to three hours of airborne arrival delay (75th percentile) in the high 20 minutes, and a fourth exceeding 50 minutes. The most disruptive event in Melbourne was on February 6, when thunderstorm activity led to two hours of airborne arrival delay (75th percentile) exceeding 40 minutes, and a third at 28 minutes.

The performance for the FY 2019 year to date is above the targets for the median (0.7 minutes, with target 0.5) and 75th percentile (3.7 minutes, with target 3.4). Compared to the same period in FY 2018 there has been an increase in the median (from 0.6 minutes) and the 75th percentile (from 3.5 minutes).

There were 34 notable events in February, which 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. Fifteen 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) or had other significant impacts such as cancelled flights.

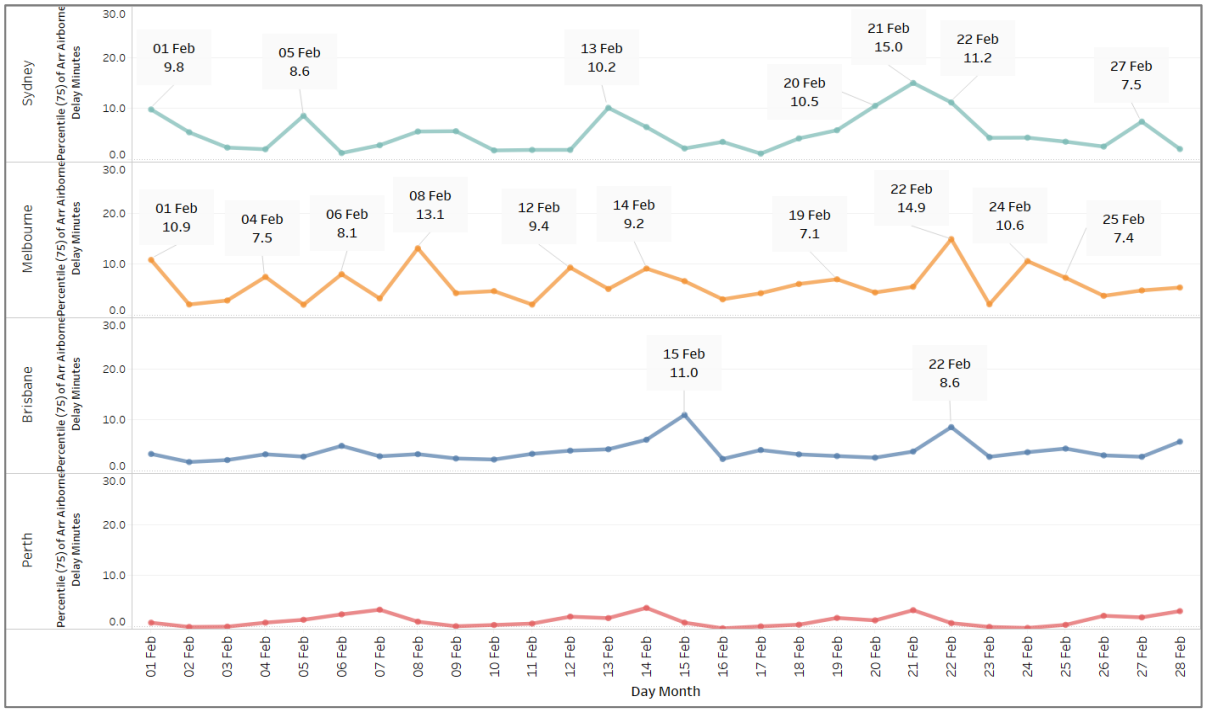

Figure 1: Notable prolonged delay impact events during February 2019

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

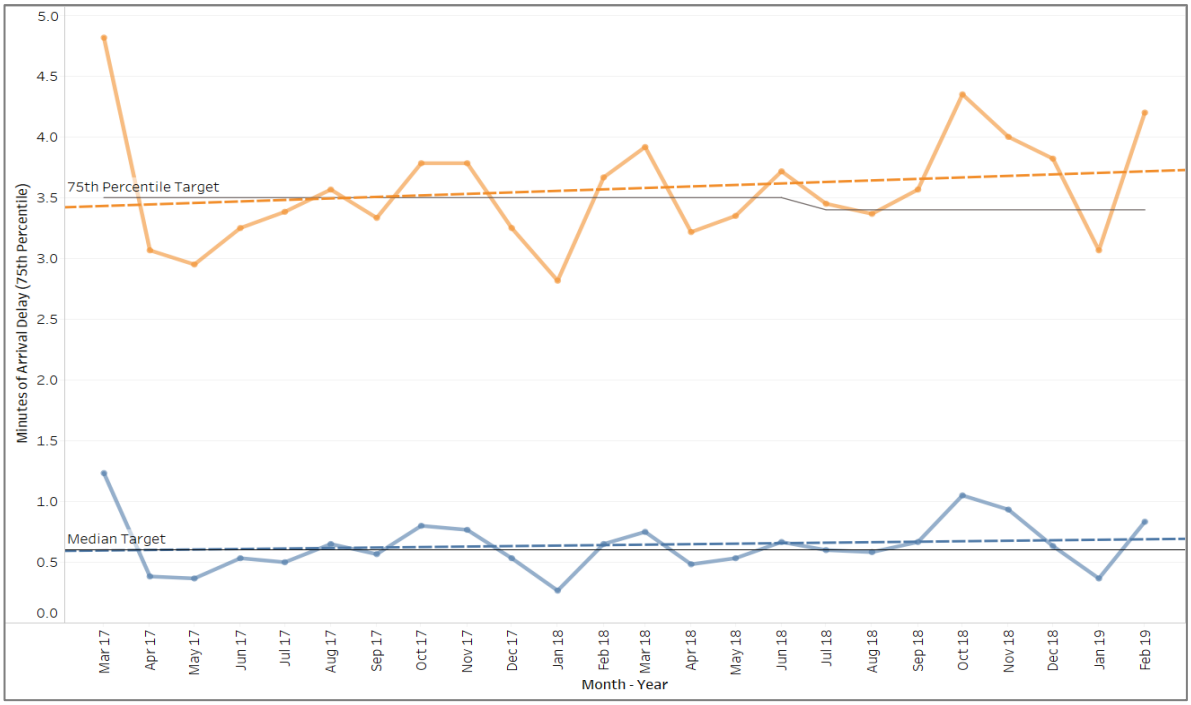

Figure 2: 24-month trend for airborne delay

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.

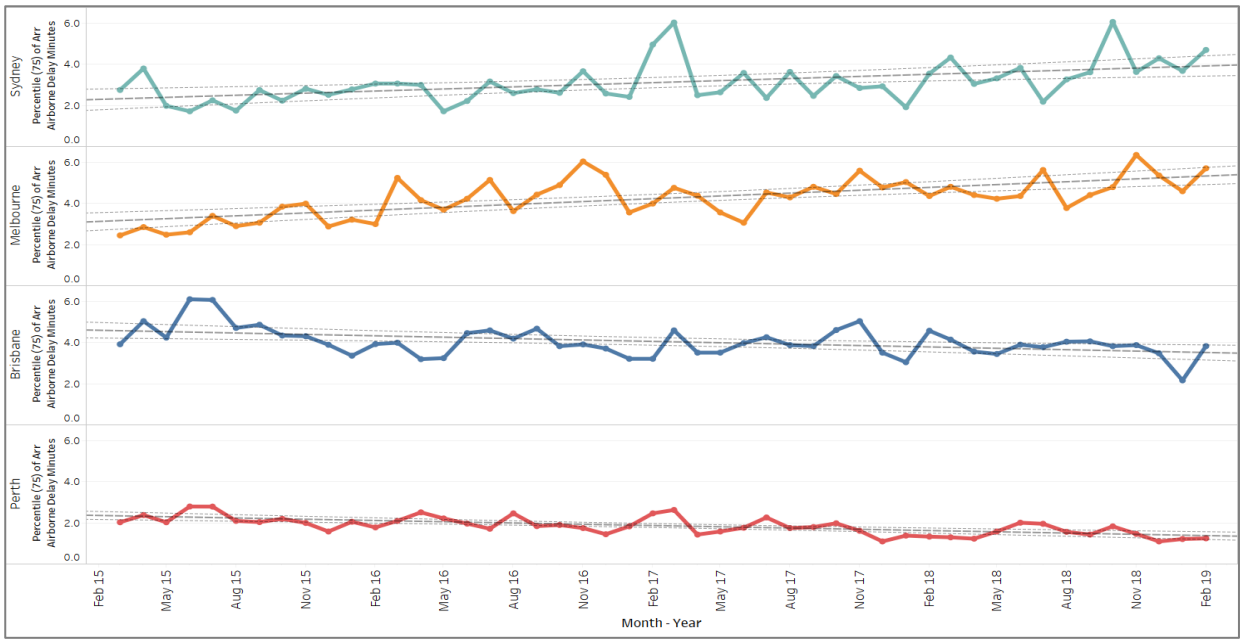

Figure 3: 48-month trend for airborne delay (75th percentile) by airport

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. February was the second highest month of adjusted total delay in 2018-19. There is no statistically significant trend.

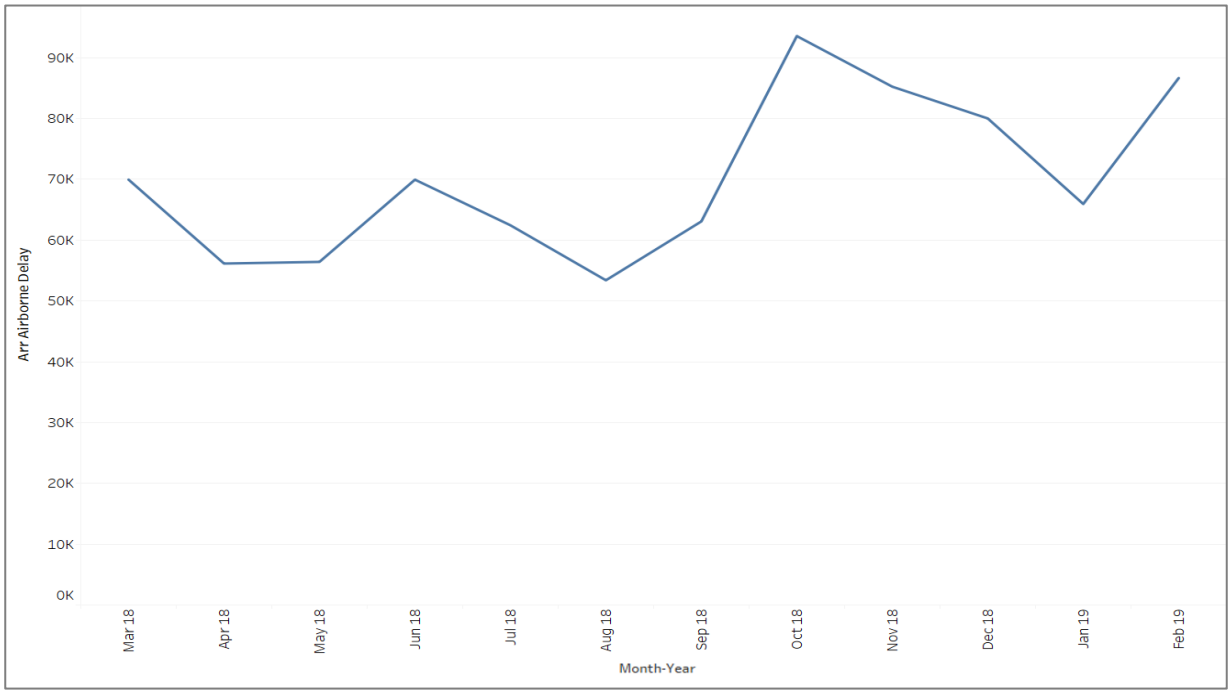

Figure 4: Total amount of airborne delay by month for Sydney, Melbourne, Brisbane and Perth Airports (March 2018 to February 2019, inclusive).

The runway configuration usage for each airport is shown in **Figure 5**. Compared to the same month last year, usage of parallel runways 16 and 34 are more balanced at Sydney (with only a difference of one hour, last year the 16 runways were used 38% more than the 34 runways). Single runway operations in Melbourne increased (25 hours additional hours), with Brisbane getting a little more usage of the crossing runway for arrivals. Perth had higher usage of a second runway for arrivals, and had a four-fold increase in the usage of runway 03 (arrivals from the south) although usage is still relatively low.

AIRPORT	Runway mode	February 2018	November 2018	December 2018	January 2019	February 2019
Sydney	16A/16D	260	240	217	263	221
	34A/34D	189	226	292	256	220
	SODPROPS (Single)	11	13	12	8	12
	34A/25D	2				
	25A/25D (Single)		25	6		6
	25A/16D	3	1			
	07A/16D	11				
	07A/07D (Single)		5			
Melbourne	16A/27D	225	215	255	295	178
	16A/16D (Single)	97	111	91	117	139
	34A/34D (Single)	60	94	79	55	42
	27A - 27/34D	58	48	63	34	63
	09A/09D (Single)	8	2	1	22	6
	27/34 LAHSO	22	24	30	19	21
	27A/27D (Single)	34	46	39	16	37
Brisbane	01A/01D (Single)	171	280	288	309	136
	01/14A 01D	28	38	97	156	48
	19A/19D (Single)	270	169	135	45	274
	01/32A 01D	7	15	6	17	1
	19/14A 19D		8			
	14A/14D (Single)			1		
Perth	21/24A 21D	157	74	224	237	164
	21A/21D (Single)	87	149	53	81	49
	03A 06/03D	60	3	38	28	62
	24A/24D (Single)	1	78	4	17	5
	06A/06D (Single)	6	26	4	5	20
	03A/03D (Single)	9	54	45		36

Figure 5: February runway configuration usage (hours) 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.

Sydney

Airborne delay

The 75th percentile performance figures for airborne delay at Sydney are indicated in **Figure 6.** February performance for the median (0.9 minutes) and the 75th percentile (4.7 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from 0.6 minutes) and 75th percentile performance (from 3.6 minutes).

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

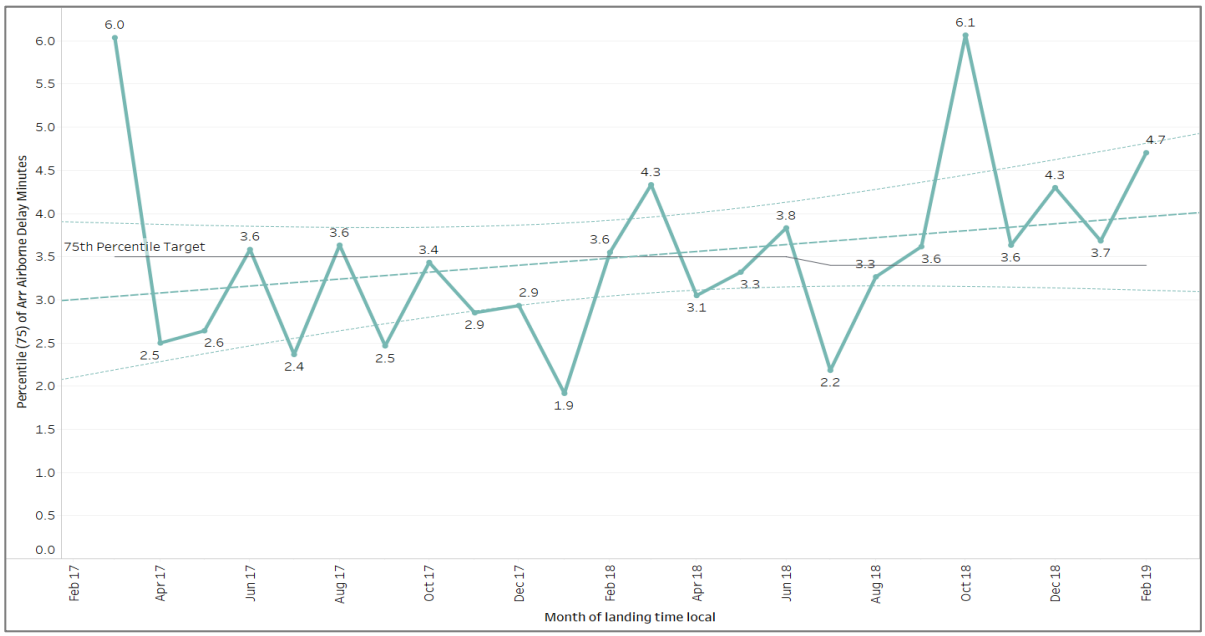

Figure 6: Sydney airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
01 February	18-21	9.8	Reduced capacity in afternoon and evening due to low cloud, wind and showers. Concentration of demand due to late non-compliant flights and off-schedule internationals in late afternoon.
02 February	09-10	5.4	Concentration of demand due to late non-compliant flights and off-schedule internationals. Persistent low cloud and showers, without reduced capacity.
05 February	07-10	8.6	Concentration of demand due off-schedule internationals.

08 February	18-21	5.5	Reduced capacity in afternoon and evening due to thunderstorms in the terminal manoeuvring area (TMA) and runway change. Level 1 GDP revision (rates reduced) about 5 hours prior to delay period due uncertainty of timing of thunderstorm. Level 3 GDP revision (rates reduced) at 1925 local.
13 February	08-11	10.2	Reduced capacity throughout the day due to worse than forecast low cloud. Concentration of demand due off-schedule internationals.
14 February	07-09	6.4	Reduced capacity in morning due to lower cloud base than forecast. Concentration of demand due off-schedule internationals.
16 February	11-12	3.5	No GDP. 37 Arrivals in 11L hour with tactical rate of 36. AUSCAL flight testing. 16R ILS not available with some low cloud.
18 February	18-19	4.2	Southern arrivals were processed to 34L only to reduce complexity due to weather diversions in TMA and reduced staffing levels.
19 February	18-19	5.8	Reduced capacity in afternoon and evening due to thunderstorms in the terminal manoeuvring area (TMA), some weather diversions.
20 February	18-20	10.5	Concentration of demand due to late non-compliant flights and off-schedule internationals. Winds and low cloud throughout the day. Level 1 GDP revision (rates reduced) about 5 hours prior to delay period for the afternoon peak.
21 February	07-09 & 11-12 & 18-21	15.0	Morning low cloud. Reduced capacity in afternoon and evening due to un-forecast low cloud. Concentration of demand due to late non-compliant flights and off-schedule internationals.
22 February	17-20	11.2	Reduced capacity in afternoon and evening due to worse than forecast low cloud. Concentration of demand due to late non-compliant flights and off-schedule internationals.
27 February	17-18	7.5	Reduced capacity in afternoon and evening due to worse than forecast low cloud. Concentration of demand due to late non-compliant flights and off-schedule internationals.

Table 1: Notable event descriptions for Sydney.

CTOT (Calculated take off time) variations

Variations from CTOT at Brisbane during the afternoon hours (1700-2100 local) are the focus of this section due to regular concentration of demand leading to increases in delay. Flights that appear at least twice (early) or five times (late) have been included in the table below.

Table 2 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	Local - ALDT HOUR	
Early	QLK230D	Wagga	17	4
	RXA833	YSDU	18	4
	RXA472	YGTH	17	3
	RXA629	YBTH	17	3
	JST661	YAYE	17	2
Late	QFA444	Melbourne	17	8
	TGG256	Melbourne	18	7
	VOZ883	Melbourne	20	6
	JST516	Melbourne	17	5
	VOZ863	Melbourne	18	5
	VOZ875	Melbourne	19	5

Table 2: CTOT variation for Sydney arrivals 1700-2200 local – February 2019. Number of occasions (minimum two) that each flight departed early or late with respect to its CTOT (-5 to +15 minutes)

The morning period (0700 to 1300 local) was also analysed as several delay events occurred during this period (Table 3).

CTOT Variation	ACID	ADEP	Local - ALDT HOUR	
Early	QLK220D	Wagga	7	5
	QLK202D	YMAY	7	4
	VOZ1148	YSTW	7	4
	QLK206D	YMAY	11	3
	QLK222D	Wagga	10	3
	RXA762	YMAY	7	2
	TGG762	Perth	7	2
Late	VOZ827	Melbourne	10	9
	QFA422	Melbourne	11	7
	VOZ932	Brisbane	11	7
	VOZ833	Melbourne	11	6
	QFA418	Melbourne	10	5
	QFA517	Brisbane	11	5
	VOZ811	Melbourne	8	5

Table 3: CTOT variation for Sydney arrivals 0700-1300 local – February 2019. Number of occasions (minimum two) that each flight departed early or late with respect to its CTOT (-5 to +15 minutes)

Melbourne

Airborne delay

The 75th percentile performance figures for airborne delay at Melbourne are indicated in **Figure 7.** February performance for the median (1.6 minutes) and the 75th percentile (5.7 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from 1.0 minutes) and 75th percentile performance (from 4.4 minutes).

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

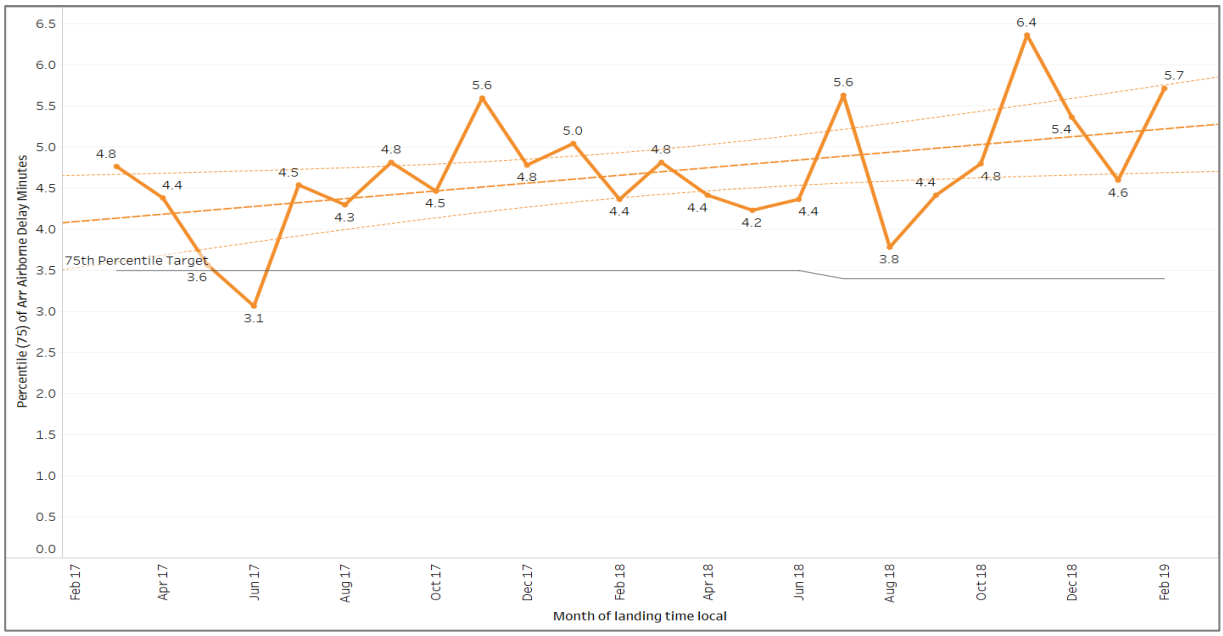

Figure 7: Melbourne airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
01 February	18-20	10.9	Concentration of demand due to late non-compliant flights and off-schedule internationals during evening peak period.
04 February	08-09	7.5	Concentration of demand due to late non-compliant flights and off-schedule internationals. Persisting forecast low cloud.
06 February	15-16 & 19-22	8.1	Concentration of demand due to late non-compliant flights and off-schedule internationals during low capacity period (single runway). Thunderstorms forecast throughout afternoon and evening. Thunderstorm presented in TMA at 1830 local. Multiple go-arounds. Second storm cell passed through at 2005 local.

08 February	08-12 & 18-19	13.1	Deteriorating conditions led to a Level 1 GDP revision (reduced rates) at 0530 local. These conditions lasted longer than anticipated by the revision. Aircraft declared an emergency. Concentration of demand due to late non-compliant flights and off-schedule internationals.
10 February	18-19	4.8	Unplanned single runway operations. GDP by demand run from 1300 to 2200 local.
12 February	18-19	9.4	Planned single runway operations during busy period. Concentration of demand due to late non-compliant flights during evening peak.
13 February	18-20	5.2	Reduced capacity due to unplanned change to single runway at 1625 local caused by highly variable winds.
14 February	18-20	9.2	Concentration of demand due to late non-compliant flights and off-schedule internationals during evening peak.
15 February	18-20	6.7	Concentration of demand due to late non-compliant flights and off-schedule internationals during evening peak.
17 February	18-19	8.8	GDP by demand 1400 to 2300 local. Single runway operations. Concentration of demand due to late non-compliant flights and off-schedule internationals during evening peak.
18 February	18-20	6.1	Concentration of demand due to late non-compliant flights and off-schedule internationals during evening peak.
19 February	07-08	7.1	Concentration of demand due to late non-compliant flights and off-schedule internationals during evening peak.
20 February	19-20	4.5	Concentration of demand due to late non-compliant flights and off-schedule internationals. Level 1 GDP revision (reduced rates) at 1200 local.
22 February	08-12 & 15-16 & 18-19	14.9	Delays due to emergency helicopter operation at 1530 local. Concentration of demand due to late non-compliant flights and off-schedule internationals.

24 February	18-21	10.6	Reduced capacity due to un-forecast wind direction. Two head of state flights and three go-arounds. GDP by demand from 1300 to 2300.
25 February	18-19	7.4	Variable winds prevented LAHSO operations (reduced rates from planned) for several hours in the early afternoon.
27 February	18-19	4.9	Concentration of demand due to late non-compliant flights and off-schedule internationals. Low capacity period (single runway operations.

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. 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. The period of CTOT variation analysis has been extended to 1300 local, as a couple of delay events extended to this time.

Table 5 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 (early) or five times (late). 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	QLK52D	Devonport	10	3
	RXA3151	YMAY	7	3
	RXA3653	Mildura	7	3
	RXA3752	Mount Gambi..	8	3
	QLK50D	Devonport	7	2
	QLK77D	Mildura	7	2
	VOZ804	Sydney	7	2
Late	TGG517	Brisbane	12	12
	QFA425	Sydney	12	8
	QFA427	Sydney	12	8
	VOZ318	Brisbane	12	8
	QFA417	Sydney	10	6
	QFA419	Sydney	10	6
	QFA423	Sydney	11	6
	QFA613	Brisbane	12	6
	JST509	Sydney	12	5

Table 5: CTOT variation for Melbourne arrivals 0700-1300 local – February 2019. Number of occasions that each flight departed early or late with respect to its CTOTs (-5 to +15 minutes).

The evening period (1700 to 2200 local) was also analysed as several delay events occurred during this period (Table 6).

CTOT Variation	ACID	ADEP	Local - ALDT HOUR	
Early	QLK58D	Devonport	17	4
	RXA3772	Mount Gambier	18	4
	JTE7485	Adelaide	21	3
	RXA3493	YMER	18	3
	RXA3683	Mildura	19	3
	QFA688	Adelaide	18	2
	QLK58D	Devonport	18	2
	RXA3187	YMAY	18	2
Late	VOZ858	Sydney	17	10
	JST531	Sydney	17	8
	QFA447	Sydney	17	7
	QFA465	Sydney	20	6
	VOZ742	Gold Coast	17	6
	QFA449	Sydney	18	5
	QFA455	Sydney	19	5
	QFA703	Cairns	17	5

Table 6: CTOT variation for Melbourne arrivals 1700-2200 local – February 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 8**. February performance (1.0 minutes median and 3.8 minutes 75th percentile) did not meet the targets. Compared to the same month last year, there was a decrease in the airborne delay median performance (from 1.4 minutes) and 75th percentile performance (from 4.6 minutes).

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

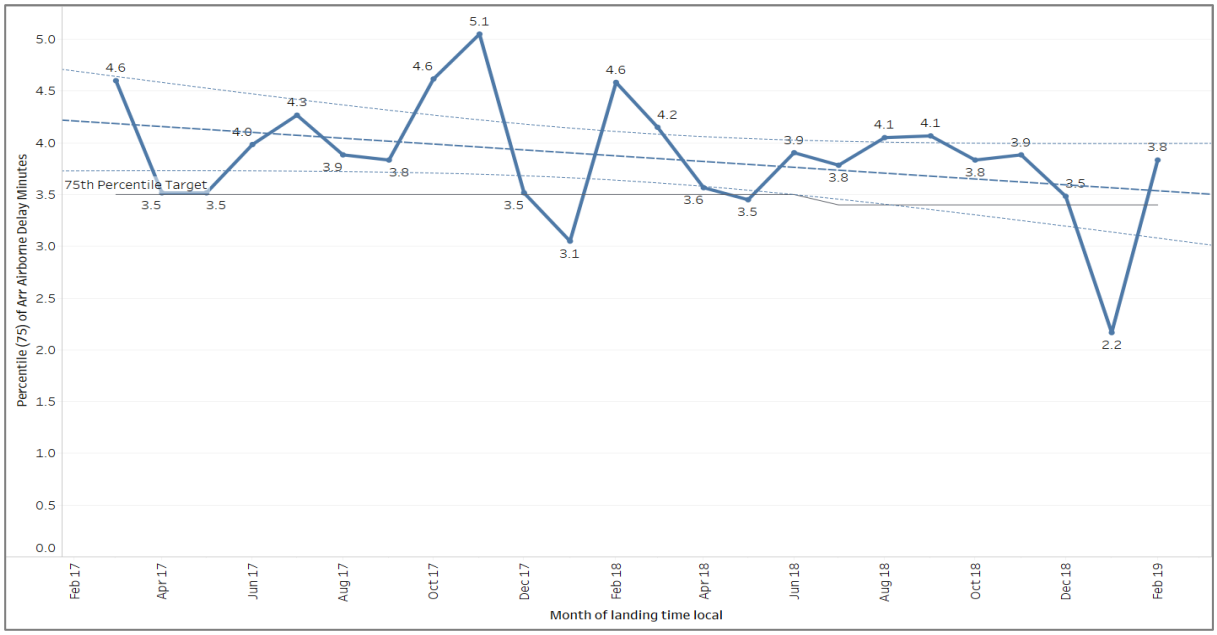

Figure 8: Brisbane airborne delay 75th percentile (last 24 months)

Notable events

Table 7 describes the notable airborne delay events during February in Brisbane.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
15 February	16-20	11.0	Concentration of demand due to late non-compliant flights and off-schedule internationals during an extended afternoon peak.
22 February	17-18	8.6	Wind shear, low cloud, turbulence and cross winds. Concentration of demand due to late non-compliant flights and off-schedule internationals during afternoon peak.
24 February	18-19	3.7	Wind shear, low cloud, turbulence and cross winds. Concentration of demand due to late non-compliant flights and off-schedule internationals during afternoon peak. GDP by demand from 0600 to 2300 local.

27 February	07-08	2.8	Concentration of demand due to late non-compliant flights and off-schedule internationals during afternoon peak.

Table 7: 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 (early) or five times (late) have been included in the table below. The analysis of CTOT variations was extended to cover 1700 to 2200 local as significant delay events were observed during this period.

Table 8 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	Local - ALDT HOUR	
Early	SKP738	YCCA	17	6
	TFR51	Darwin	21	5
	UJN	Maryborough	19	5
	QLK325	Bundaberg	18	4
	MEH	Maryborough	19	3
	QLK325D	Bundaberg	18	3
	JST833	YBPN	19	2
	TFX129	Rockhampton	21	2
	UJS	Maryborough	19	2
Late	QFA634	Melbourne	20	9
	JST566	Melbourne	18	6
	QFA546	Sydney	19	6
	QFA628	Melbourne	18	6
	QFA548	Sydney	19	5
	VOZ351	Melbourne	20	5
	VOZ1225	Canberra	18	5

Table 8: CTOT variation for Brisbane arrivals 1700-2200 local – February 2019. Number of occasions (minimum two) that each flight departed early or late with respect to its CTOT (-5 to +15 minutes)

The morning period (0700 to 1300 local) was also analysed as several delay events occurred during this period (Table 9).

CTOT Variation	ACID	ADEP	Local - ALDT HOUR	
Early	QLK319	Bundaberg	7	4
	QLK323	Bundaberg	10	3
	JST668	YAYE	12	2
	QLK331D	Gladstone	7	2
	QLK367D	Rockhampton	12	2
	QLK451D	Moranbah	11	2
	VOZ1238	Rockhampton	11	2
Late	JST560	Melbourne	8	6
	QFA512	Sydney	9	6
	QFA516	Sydney	10	6
	QFA612	Melbourne	11	6
	QJE1789	YBTL	11	6
	VOZ319	Melbourne	10	6
	QFA506	Sydney	8	5
	QFA604	Melbourne	8	5

Table 9: CTOT variation for Brisbane arrivals 0700-1300 local – February 2019. 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 9**. February performance (-0.5 minutes median and 1.3 minutes 75th percentile) met the targets. Compared to the same month last year, there was a decrease in the airborne delay median performance (from -0.3 minutes) and 75th percentile performance was unchanged.

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

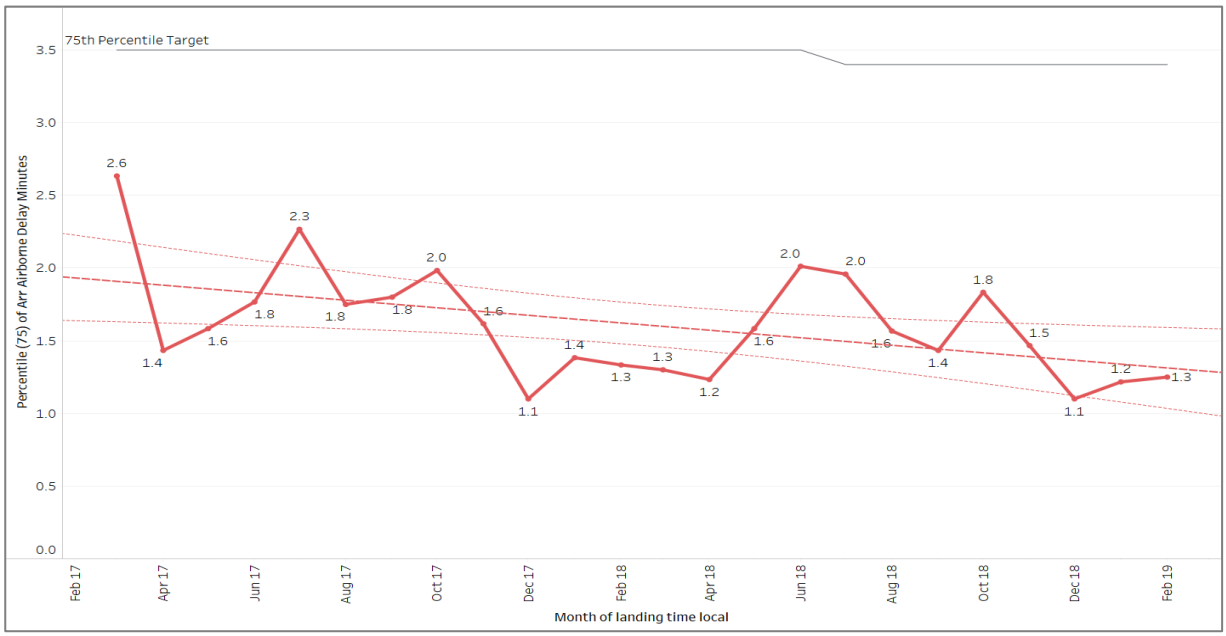

Figure 9: Perth airborne delay 75th percentile (last 24 months)

Notable events

There were no notable events in Perth in February.

Appendix B

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).