ATM Network Performance Report

April 2019

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Summary

This report focusses on the performance of the Air Traffic Network in April 2019. The combined 75th percentile performance during April for airborne delay across the four major airports (Sydney, Melbourne, Brisbane and Perth) was **3.7** minutes. The median airborne delay across these airports was **0.7** minutes. These results did not meet the KPI targets and increased compared to the same period last year.

The airborne delay outcomes for April were the forth lowest (75th percentile) and fifth lowest median) observed in FY 2019. Airborne delay was lower than the preceding two months (4.2 minutes February, 4.4 minutes March) corresponding to a decrease in the number of notable events this month (26 compared to 34 in February and 36 in March). There were 10 notable events in Sydney, 11 in Melbourne and 5 in Brisbane.

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 (3.8 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 26 notable events in April, which are summarised under each of the airport sections below**.** Thirteen 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).

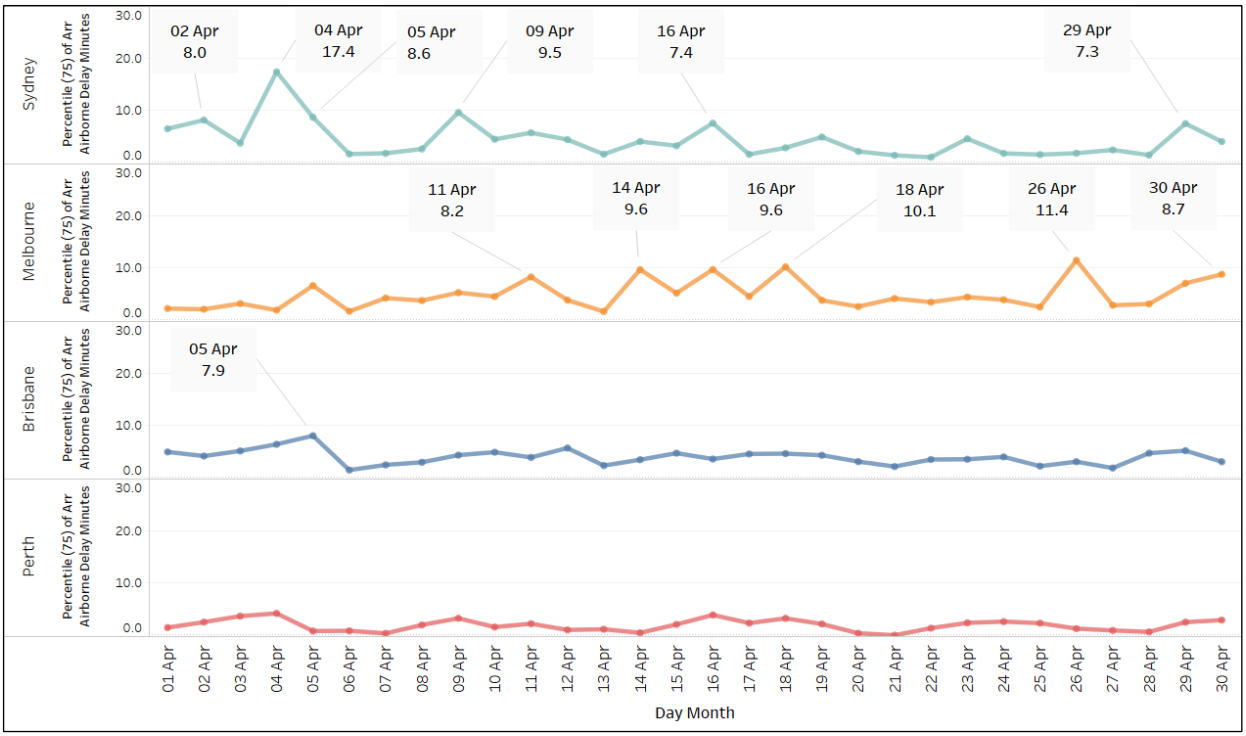

Figure 1: Notable prolonged delay impact events during April 2019

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 shows an increase in both measures.

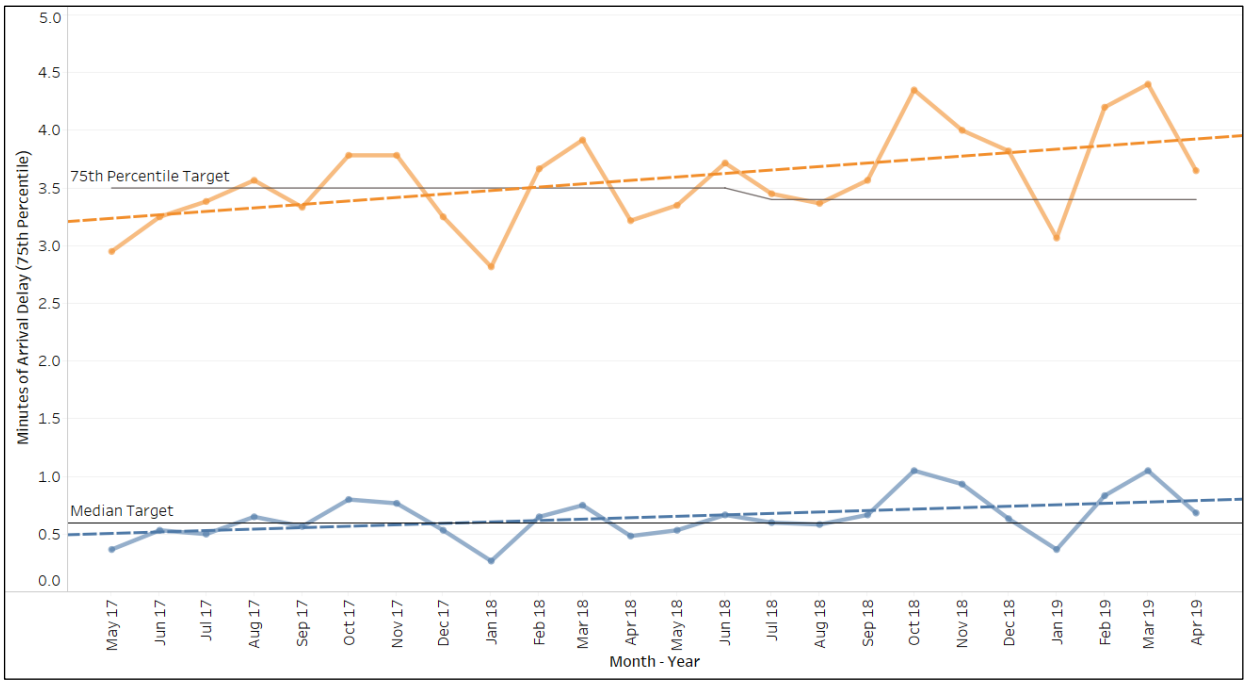

Figure 2: 24-month trend for airborne delay

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, and the trends for Brisbane and Perth are downwards. More detailed analysis for each airport is presented later in this report.

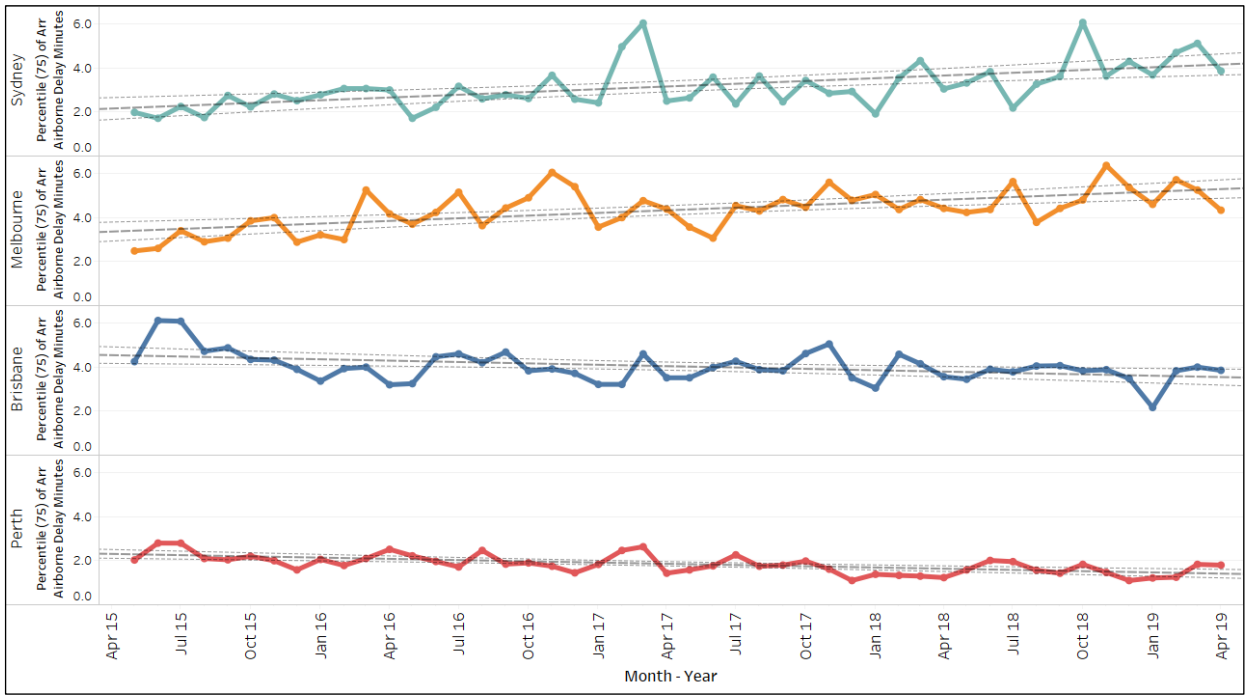

Figure 3: 48-month trend for airborne delay (75th percentile) by airport

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. April was the fifth lowest month of adjusted total delay in 2018-19.

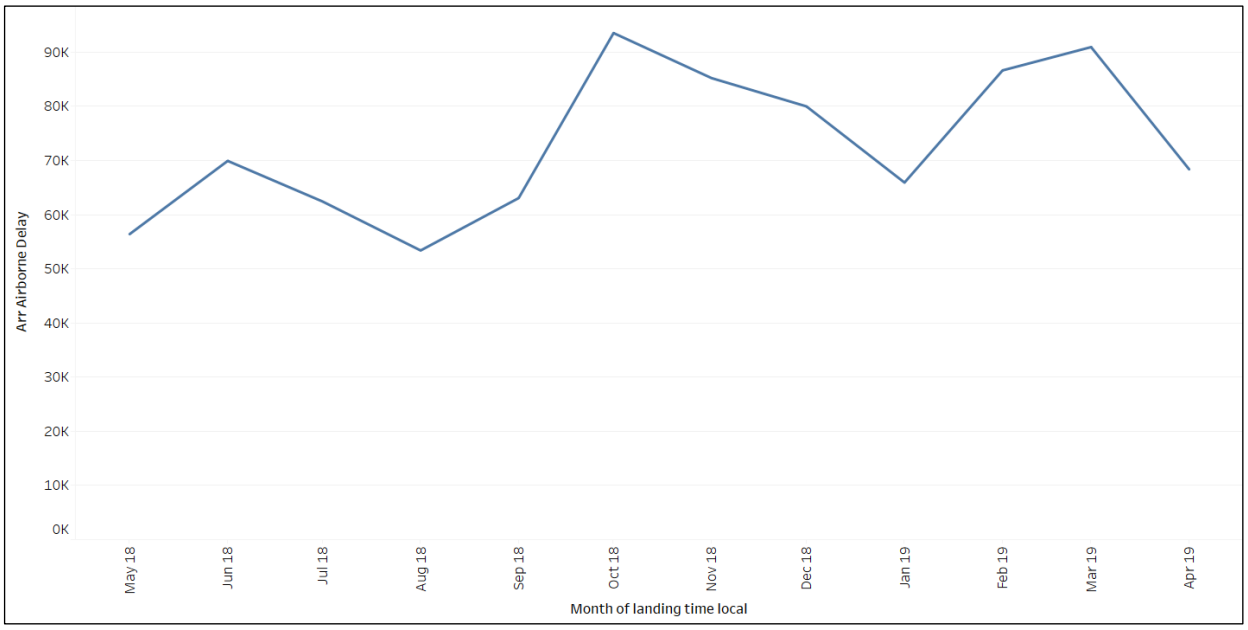

Figure 4: Total amount of airborne delay by month for Sydney, Melbourne, Brisbane and Perth Airports (May 2018 to April 2019, inclusive).

Runway configuration

The runway configuration usage for each airport is shown in **Figure 5**. Single runway operations at Sydney were low (20 hours total) and decreased in Melbourne (28 hours less than the same month last year. However, single runway operations increased modestly at Brisbane (37 hours more) and by almost five times in Perth (403 hours compared to 82 in April last year).

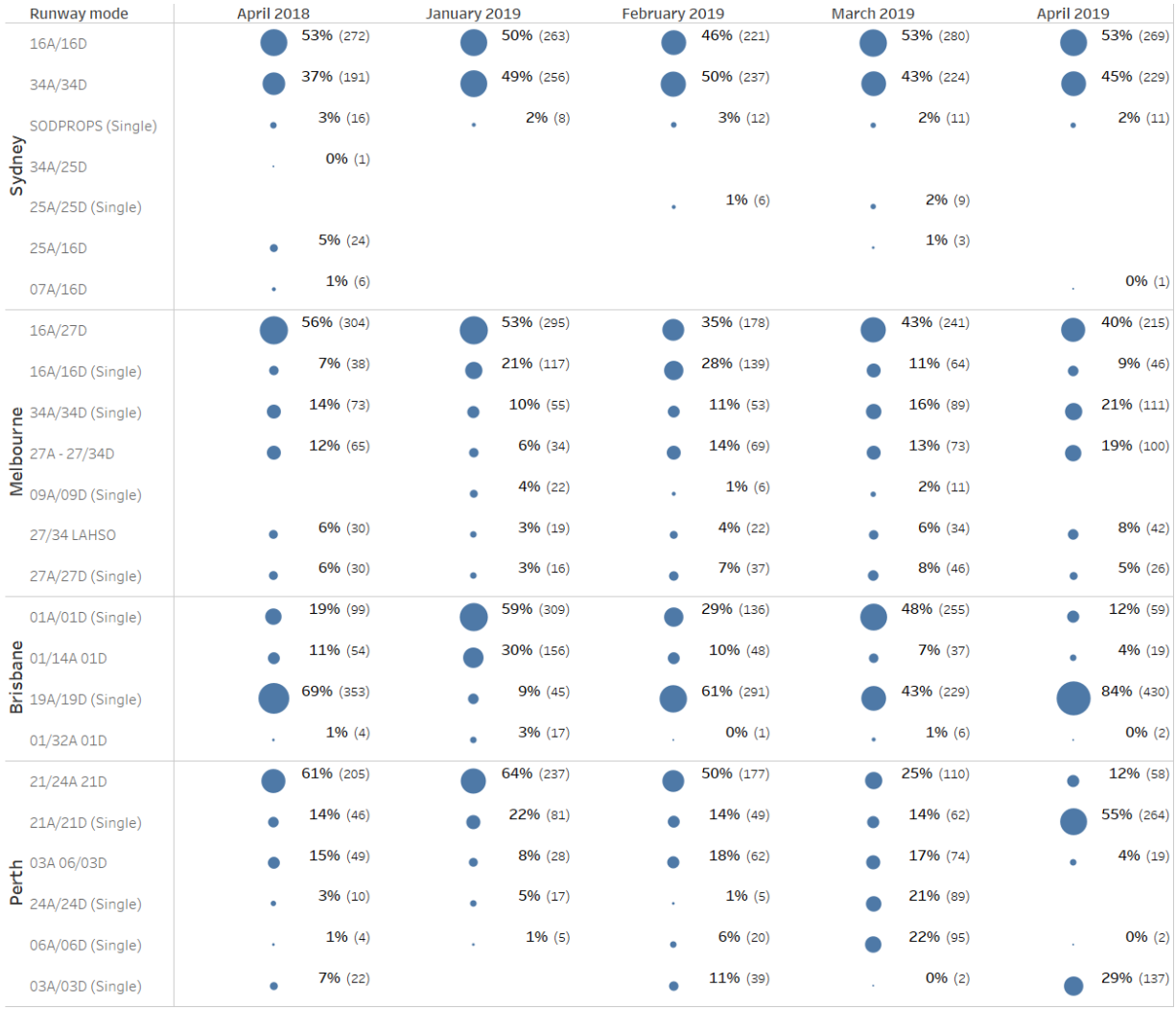

Figure 5: April runway configuration usage (percentage of total and hours in brackets) by airport (Sydney 06-22L, Melbourne 06-23L, Brisbane 06-22L and Perth 06-21L). Single runway configurations indicated in parentheses. Note: Sydney runway mode selection takes into account the Long Term Operating Plan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

Traffic levels and composition changes

Figure 6 shows traffic levels and composition changes since the beginning of 2017. Overall traffic levels are relatively steady across all four airports. The changes in total traffic from 2017 to 2018 were 0.0% at Sydney, 1.7% at Melbourne, -1.3% at Brisbane and 0.2% Perth.

However, there have been changes to the domestic-international flight mix during this time. Sydney, Melbourne and Brisbane have all seen an increase in the level of international traffic (orange bars). In 2018, international traffic increased by 4% in Sydney, 10% in Melbourne and 8% in Brisbane compared to 2017. This indicates that there are more flights potentially impacting on the effectiveness Ground Delay Program as ground delay is only applied to domestic flights. An increase in aircraft that are not required to comply to with a regulated arrival time may lead to increases in airborne delay.

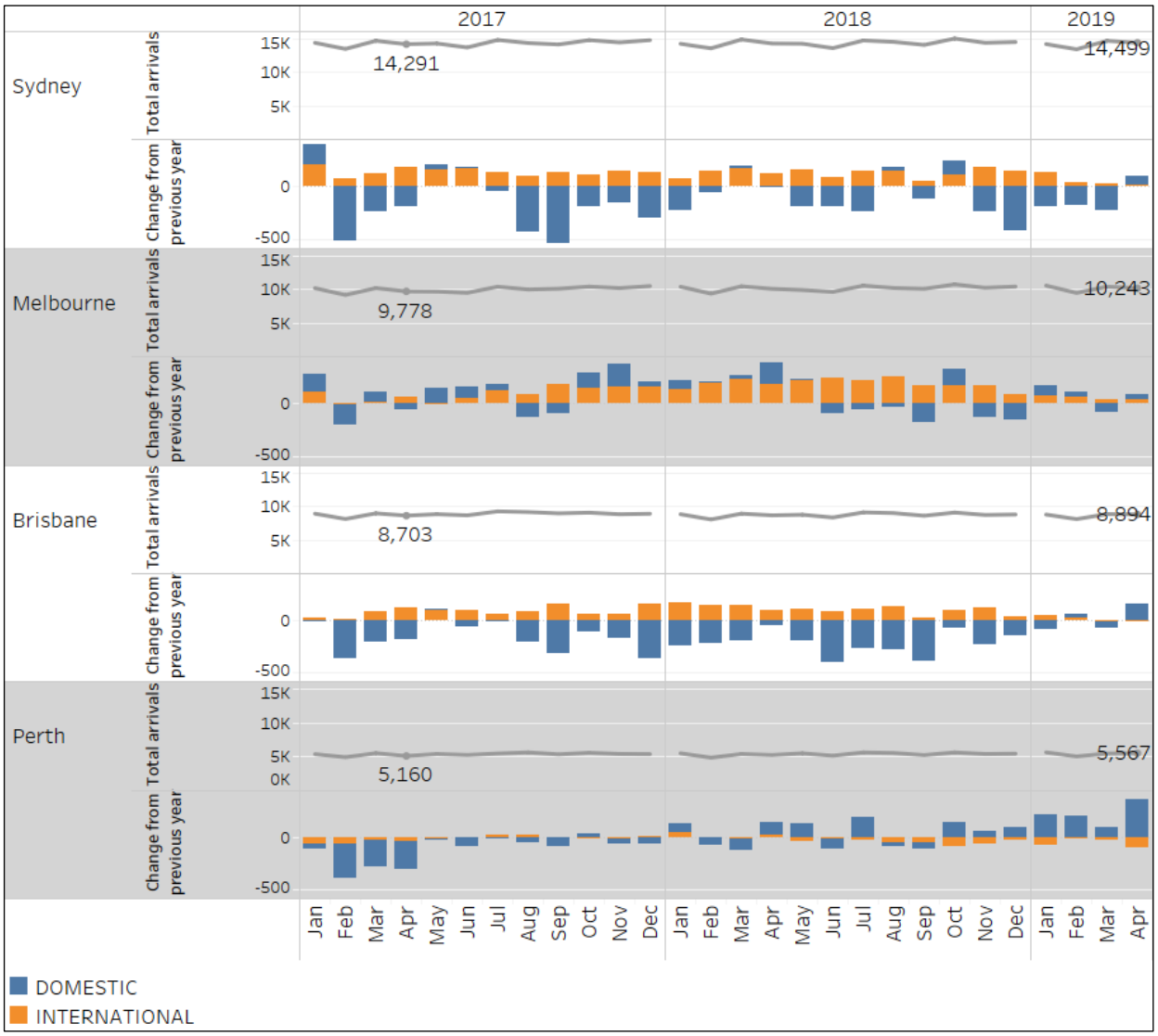

Figure 6: Traffic levels and composition change since January 2017. Grey lines show overall traffic numbers (annotated figures compare current month to same month two years earlier). Coloured bars show change in traffic compared to the same month the previous year for domestic (blue) and international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

Demand and capacity

Figure 7 details estimates of the number of hours each month where demand is significantly above capacity (hours where demand is three or more flights higher than the METCDM rate). There has been an increase in the number of hours of with excess demand at Melbourne in the last 24 months. The 24-month trend is down in Brisbane, and flat in Sydney and Perth.

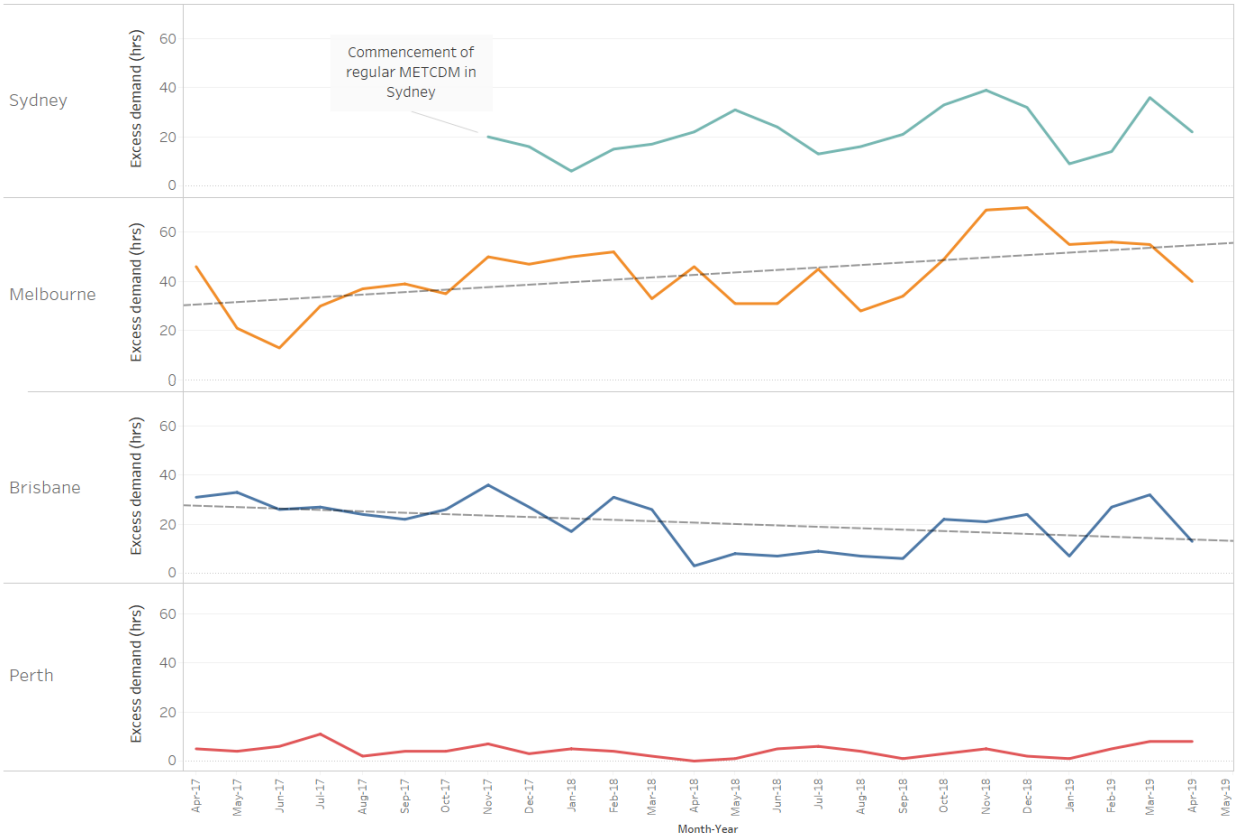

Figure 7: Excess demand estimates. Line indicates number of hours where estimated demand exceeds the METCDM rate for that hour by three or more flights. Demand is estimated using Harmony Base Estimated Landing Time.

Sydney

Airborne delay

The 75th percentile performance figures for airborne delay at Sydney are indicated in **Figure 8.** April performance for the median (0.6 minutes) and the 75th percentile (3.9 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from 0.3 minutes) and 75th percentile performance (from 3.1 minutes).

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

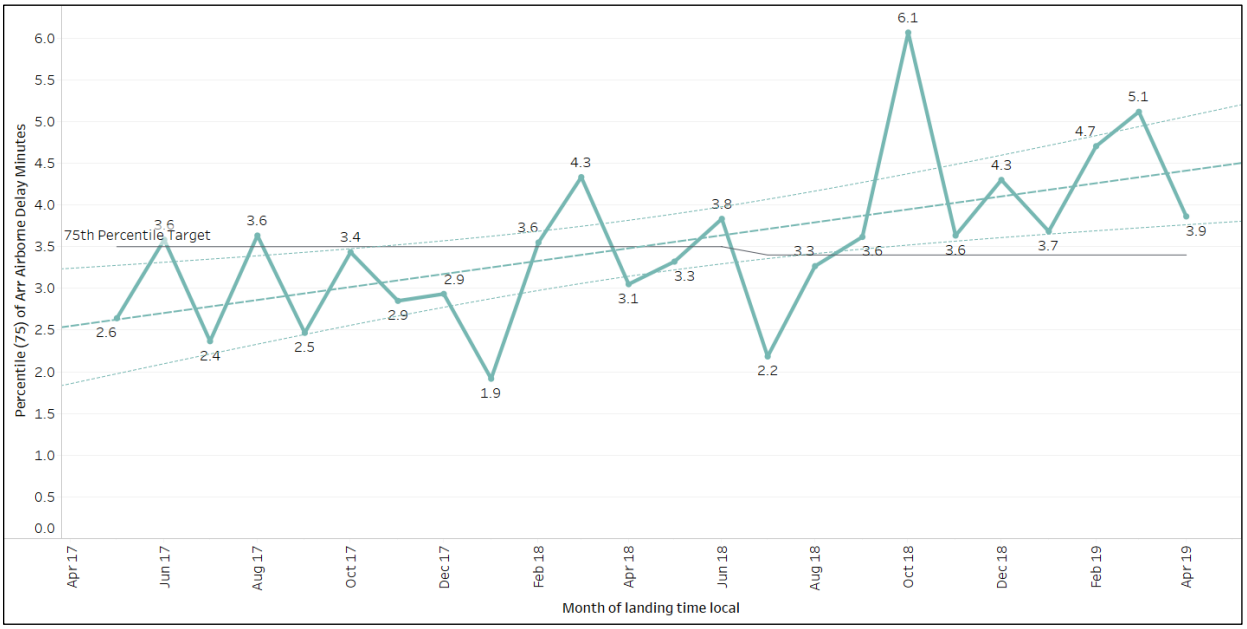

Figure 8: Sydney airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
01 April	18-19	6.3	Reduced capacity in evening due to showers. Tactical rates reduced.
02 April	08-09	8.0	Concentration of demand due to off-schedule international flights during morning peak period.
03 April	07-10	3.6	Reduced capacity in the morning dur to fog. Level 2 GDP Revision at 0525L with rates reduced. Level 2 GDP Revision at 0725L to extend period of reduced rates.
04 April	18-22	17.4	Reduced capacity in the evening due to convective weather impacting approach. Tactical rates reduced.

05 April	18-20	8.6	Reduced capacity in the evening due to showers. Tactical rates reduced.
09 April	17-20	9.5	Reduced capacity due to thunderstorms in the evening combined with concentration of demand due to two medical flights. Tactical rates reduced.
16 April	07-09	7.4	Concentration of demand due to off-schedule international flights during morning peak period.
19 April	08-09	4.8	Concentration of demand due to off-schedule international flights during morning peak period.
29 April	08-09	7.3	Reduced capacity due hazard reduction burns (tactical rates reduced) and runway inspection following fuel leak. (no arrivals for eight minutes).
30 April	08-09	3.9	Concentration of demand due to off-schedule international flights during morning peak period.

Table 2: Notable event descriptions for Sydney.

Melbourne

Airborne delay

The 75th percentile performance figures for airborne delay at Melbourne are indicated in **Figure 9.** April performance for the median (1.0 minutes) and the 75th percentile (4.3 minutes) did not meet the targets. Compared to the same month last year, there was a decrease in the airborne delay median performance (from 1.1 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.

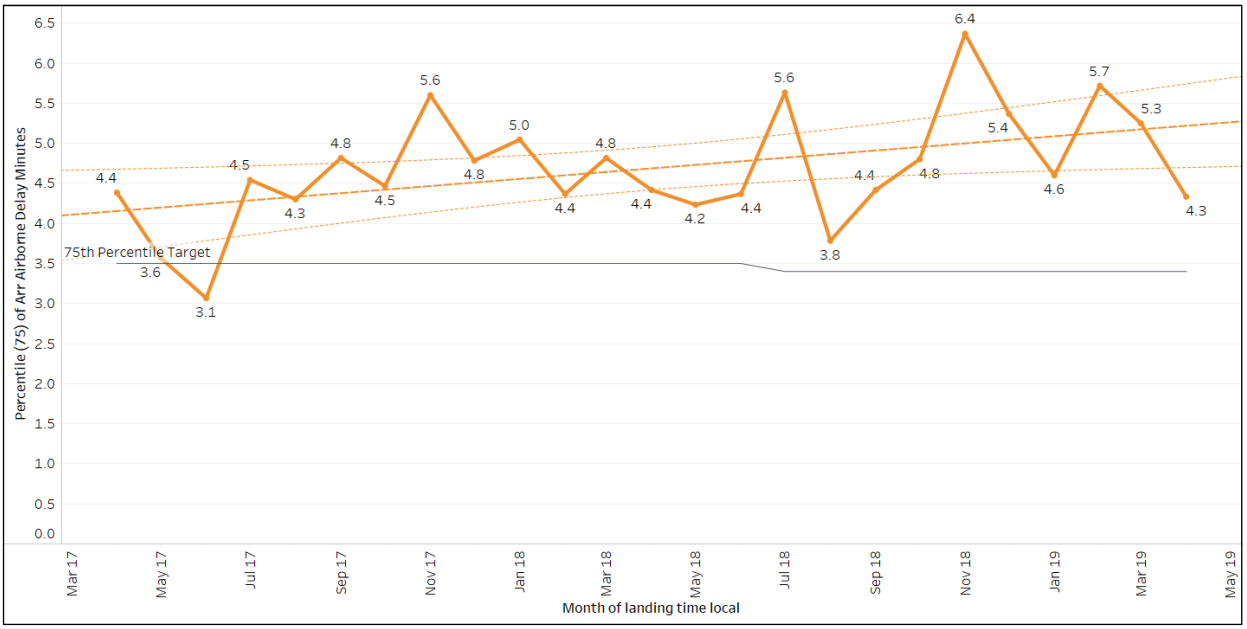

Figure 9: Melbourne airborne delay 75th percentile (last 24 months)

Notable events

Table 3 describes the notable airborne delay events during April in Melbourne.

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
05 April	08-10	6.5	Concentration of demand due to late non-compliant flights and off-schedule internationals during morning peak period.
11 April	18-20	8.2	Concentration of demand due to late non-compliant flights and off-schedule internationals during an extended period of low capacity (single runway operations).
14 April	18-21	9.6	Concentration of demand due to late non-compliant flights at the beginning of a period of low capacity (single runway operations).

15 April	11-12	5.0	Concentration of demand due to late non-compliant flights and off-schedule internationals during the late morning.
16 April	07-09 & 11-12	9.6	Concentration of demand due to late non-compliant flights, off-schedule internationals and flights with longer than anticipated flight times during a low capacity period (single runway operations).
18 April	16-21	10.1	Late non-compliant flights at the start of a low capacity period (single runway operations).
23 April	07-08	4.3	Concentration of demand due to off-schedule international flights during morning peak period.
24 April	11-12	3.7	Concentration of demand due to late non-compliant flights during late morning.
26 April	18-20	11.4	Concentration of demand due to late non-compliant flights and off-schedule internationals during a low capacity period (single runway operations).
29 April	07-10	6.9	Reduced capacity due to low cloud preventing Land and Hold Short Operations (LAHSO). Reduced tactical rates.
30 April	07-09 & 11-12	8.7	Reduced capacity due winds preventing LAHSO. Tactical rates reduced.

Table 3: 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. **Table 4** 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	RXA3657	Mildura	11	7
	QLK79D	Mildura	11	3
	JST433	Gold Coast	9	2
	QLK50D	Devonport	7	2
	QLK77D	Mildura	7	2
	RXA3653	Mildura	8	2
	RXA3752	Mount Gambier	8	2
Late	QFA421	Sydney	11	8
	QFA409	Sydney	8	6
	JST981	Perth	7	5
	QFA413	Sydney	9	5
	QFA415	Sydney	9	5
	QFA423	Sydney	11	5
	TGG229	Sydney	11	5

Table 4: CTOT variation for Melbourne arrivals 0700-1100 local – April 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 2000 local) was also analysed as several delay events occurred during this period (**Table 5**).

CTOT Variation	ACID	ADEP	Local - ALDT HOUR	
Early	RXA3772	Mount Gambier	18	4
	QLK286D	Launceston	18	3
	JST441	Gold Coast	18	2
	JST740	Launceston	18	2
	RXA3187	Albury	18	2
	RXA3683	Mildura	19	2
Late	JST521	Sydney	17	10
	VOZ858	Sydney	17	8
	VOZ878	Sydney	20	8
	QFA453	Sydney	18	7
	QFA459	Sydney	19	7
	QFA479	Sydney	20	7
	VOZ874	Sydney	19	7
	VOZ882	Sydney	20	7
	JST525	Sydney	20	5
	QFA445	Sydney	17	5
	QFA447	Sydney	17	5
	RXA3493	Merimbula	18	5

Table 5: CTOT variation for Melbourne arrivals 1700-2000 local – April 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**. April performance for the median (1.2 minutes) and 75th percentile (4.3 minutes) did not meet the targets. Compared to the same month last year, there was an increase in the airborne delay median performance (from 0.9 minutes) and 75th percentile performance (from 3.6 minutes).

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

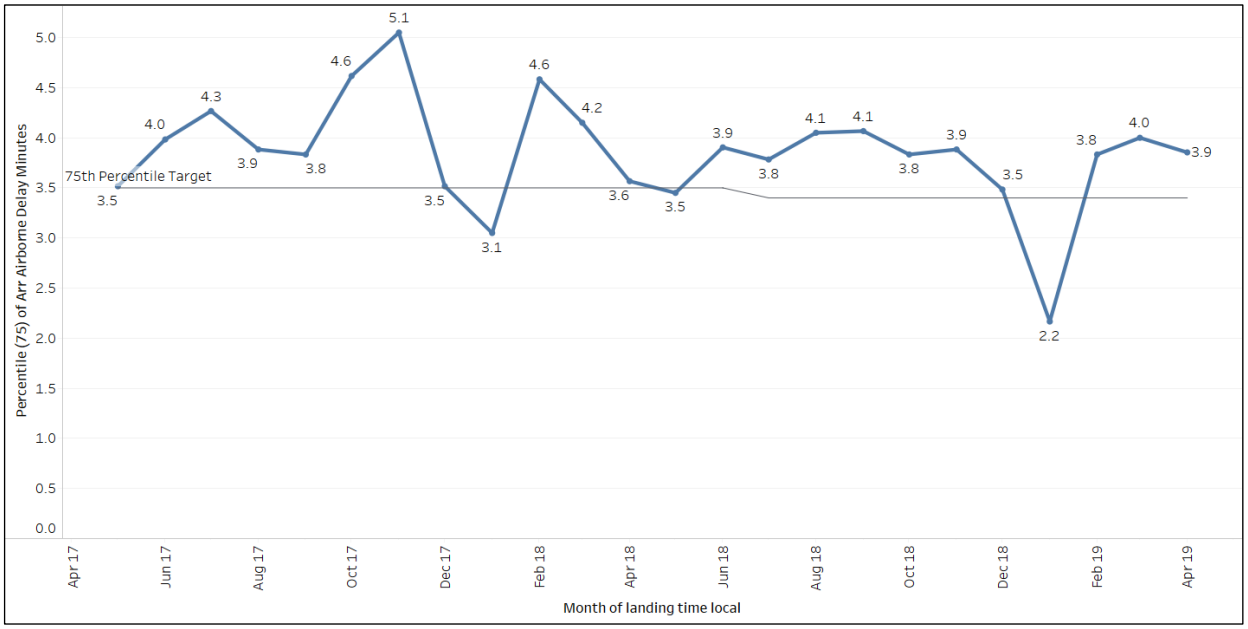

Figure 10: Brisbane airborne delay 75th percentile (last 24 months)

Notable events

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

Day	Local Time	Delay (minutes – 75th percentile)	Event Descriptions (*Contributing causes to increased delays*)
04 April	07-08	6.3	Concentration of demand due to off-schedule international flights during morning peak period.
05 April	17-19	7.9	Concentration of demand due to late non-compliant flights during evening peak period.
12 April	17-18	5.5	Concentration of demand due to late non-compliant flights during evening peak period.

28 April	18-19	4.5	Concentration of demand due to late non-compliant flights, off-schedule internationals and a medical flight during the evening peak period.
29 April	19-20	5.0	Concentration of demand due to off-schedule internationals and flights with longer than anticipated flight times during the evening peak period.

Table 6: Notable event descriptions for Brisbane.

CTOT variations

Variations from CTOT at Brisbane during the afternoon hours (1700-2000 local) are the focus of this section due to regular concentration of demand leading to increases in delay. **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	9
	JST833	Proserpine	19	3
	QJE1795	YBTL	21	2
	QJE1797	YBTL	19	2
	QLK325	Bundaberg	18	2
	QLK369D	Rockhampton	20	2
	QLK465D	Moranbah	18	2
	QLK561	YROM	18	2
	YJS	Maryborough	19	2
Late	JST566	Melbourne	21	7
	QFA634	Melbourne	21	6
	QFA825	Darwin	17	6
	QFA626	Melbourne	18	5
	TGG384	Sydney	20	5

Table 7: CTOT variation for Brisbane arrivals 1700-2000 local – April 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**. April 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) trend for airborne delay at Perth is downwards. However, the 24-month trend is flat.

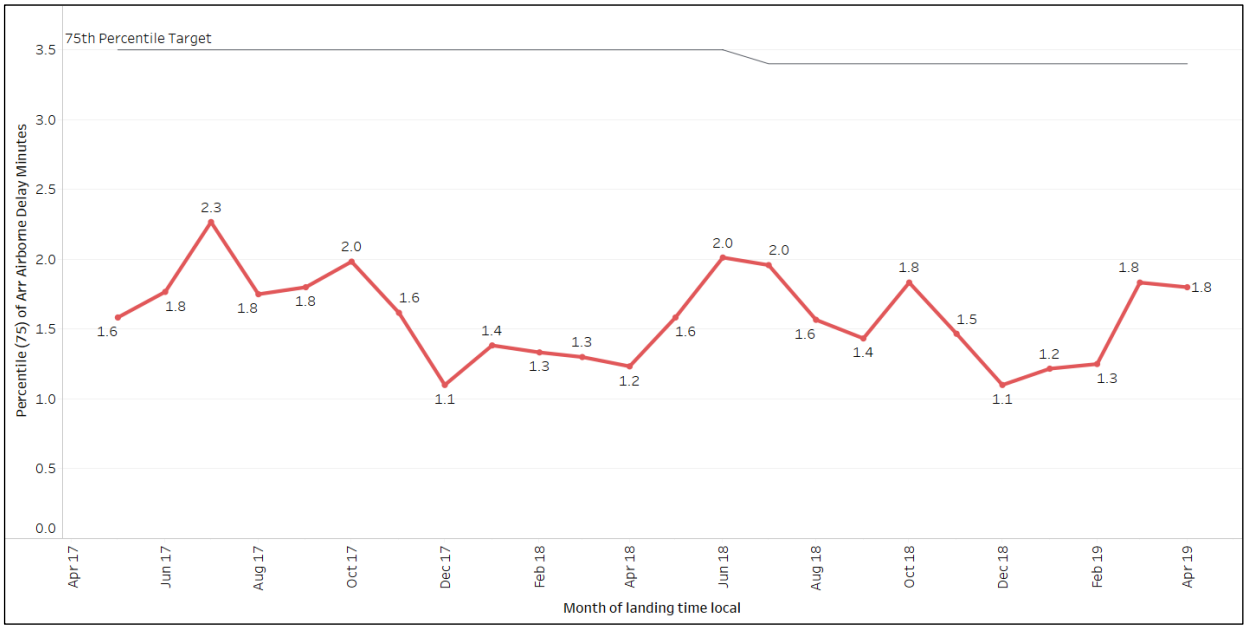

Figure 11: Perth airborne delay 75th percentile (last 24 months)

Notable events

There were no notable events in Perth in April.

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).