International Civil Aviation Organization

INFORMATION PAPER

Asia and Pacific (APAC)
Twelfth Meeting of the Meteorological Requirements Working Group (MET/R WG/12)

Bangkok, Thailand, 02 to 05 May 2023

Agenda Item 4: Collaboration between MET and ATM stakeholders

COLLABORATIVE DECISION MAKING BETWEEN AUSTRALIAN BUREAU OF METEOROLOGY, AIRSERVICES AUSTRALIA AND OTHER ATM STAKEHOLDERS

(Presented by Australia)

SUMMARY

This paper presents Meteorological Collaborative Decision Making (MET CDM), used in Australia, to formulate aircraft arrival rates for Air Traffic Flow Management (ATFM).

1. INTRODUCTION

1.1 MET CDM entails collaboration between Airservices operational and support staff, Australian Bureau of Meteorology, and airline Aviation Meteorologists (AVMET) to generate forecast products used to inform pre-tactical traffic management strategies. ATFM measures are used to reduce airborne delays via a Ground Delay Program (GDP) at Melbourne, Sydney, Brisbane, and Perth airports. The aim is to provide predictability and minimise alterations to published GDP. The planning process aims to optimise runway capacity by closing the gap between planned and actual arrival rates.

1.2 Airservices Network Coordination Centre (NCC) provides ATFM and the embedded NCC Bureau of Meteorology Unit (NCCMET) enhances this capability.

1.3 CDM involves sharing of information to improve Air Traffic Management (ATM). CDM is applied from long-range planning of schedules to the tactical decisions taken on day of operations. Each user may participate to a level that suits their operations and information requirements. However, to maximise ATM benefits, it is important that all affected users participate in information sharing.

2. DISCUSSION

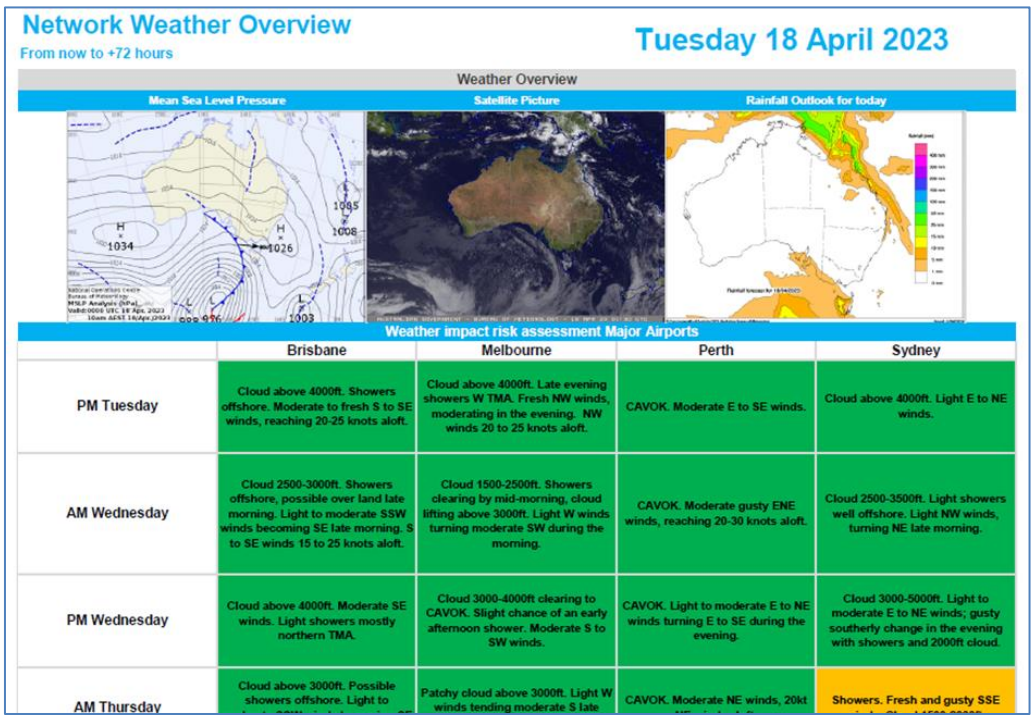
2.1 GDP - Arrivals (GDP-A) are utilised in Sydney, Brisbane, Perth, and Melbourne. The purpose of GDP-A is to reduce the airborne holding for airlines. For example, when weather conditions change (for better or worse) GDP-A revisions are made to provide new arrival rates.

2.2 GDP - Departures (GDP-D) is used at Perth, between 2130 to 0030 UTC on weekdays. for efficient management of departing traffic. At 0815 UTC the day before, the program is run and managed in the same way as GDP-A to meet the capacity based on meteorological and airport conditions.

2.3 NCC MET aids pre-tactical planning with:

- MET CDM products and services.

- Provision of a 72-hour rolling forecast (today, tomorrow and the following day), in consultation with other BoM forecasting centres; for GDP airports with a focus on prediction of major weather event(s) likely to cause traffic flow disruptions or reductions to airport capacity.
- Three-day forecast as part of the ATFM Daily Plan (ADP) are issued three times a day each morning, midday, and evening, or as otherwise amended.
- Seven-day meteorological impact outlook for the Network Operations Weekly Debrief and teleconference.



Network Weather Overview

From now to +72 hours

Tuesday 18 April 2023

Weather Overview

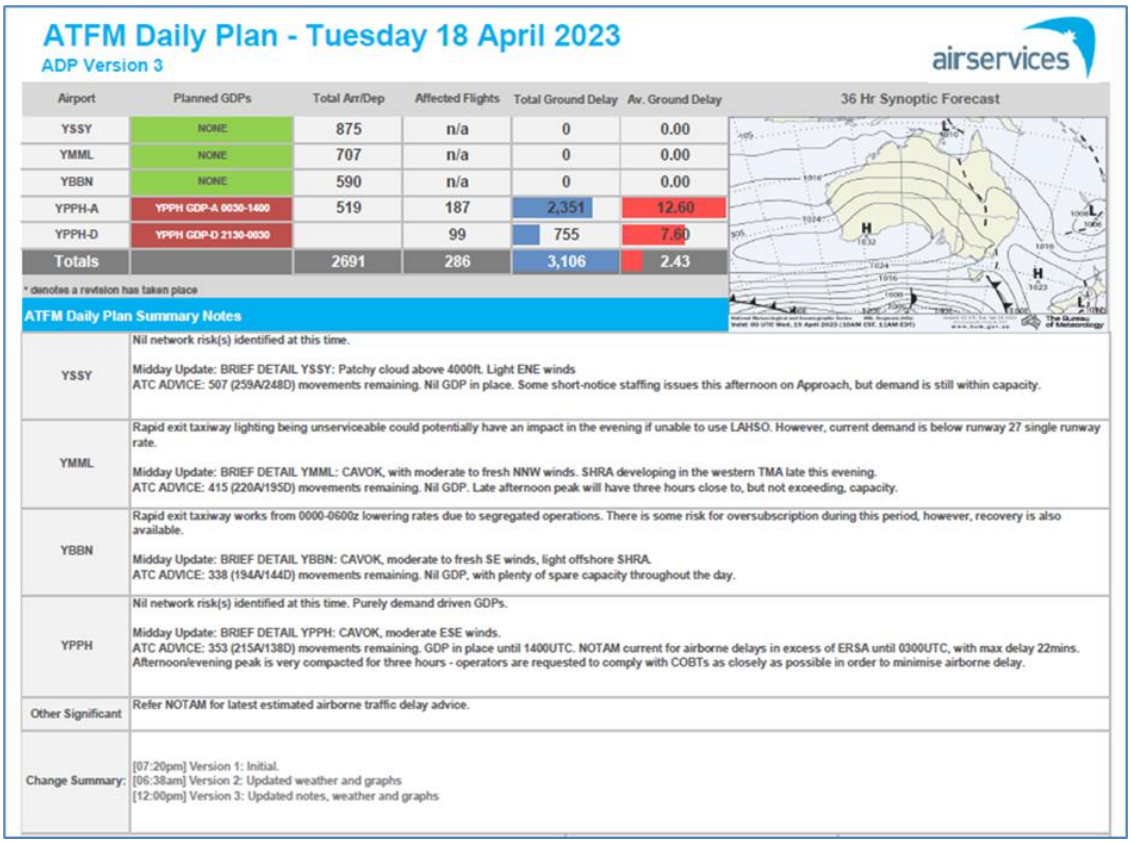
Mean Sea Level Pressure | Satellite Picture | Rainfall Outlook for today

Weather impact risk assessment Major Airports

	Brisbane	Melbourne	Perth	Sydney
PM Tuesday	Cloud above 4000ft. Showers offshore. Moderate to fresh S to SE winds, reaching 20-25 knots aloft.	Cloud above 4000ft. Late evening showers W TMA. Fresh NW winds, moderating in the evening. NW winds 20 to 25 knots aloft.	CAVOK. Moderate E to SE winds.	Cloud above 4000ft. Light E to NE winds.
AM Wednesday	Cloud 2500-3000ft. Showers offshore, possible over land late morning. Light to moderate SSW winds becoming SE late morning. S to SE winds 15 to 25 knots aloft.	Cloud 1500-2500ft. Showers clearing by mid-morning, cloud lifting above 3000ft. Light W winds turning moderate SW during the morning.	CAVOK. Moderate gusty ENE winds, reaching 20-30 knots aloft.	Cloud 2500-3500ft. Light showers well offshore. Light NW winds, turning NE late morning.
PM Wednesday	Cloud above 4000ft. Moderate SE winds. Light showers mostly northern TMA.	Cloud 3000-4000ft clearing to CAVOK. Slight chance of an early afternoon shower. Moderate S to SW winds.	CAVOK. Light to moderate E to NE winds turning E to SE during the evening.	Cloud 3000-5000ft. Light to moderate E to NE winds; gusty southerly change in the evening with showers and 2000ft cloud.
AM Thursday	Cloud above 3000ft. Possible showers offshore. Light to	Patchy cloud above 3000ft. Light W winds tending moderate S late	CAVOK. Moderate NE winds, 20kt	Showers. Fresh and gusty SSE

2.4 MET CDM includes:

- Modelling a full day GDP using the MET CDM proposed rates and runway configurations for GDP airports to identify factors (for example, weather and facilities) that may affect capacity.
- Review demand against declared arrival rates and determine the requirement for a GDP based on established parameters.
- Provide a recommendation whether a GDP is required or not and determine the appropriate timings for the GDP.
- GDP recommendations are discussed with the relevant operational ATC units. GDP ‘X-Factors’ may be applied with reference to local operational knowledge.
- GDP have programmed run times to allow airlines time to manage any changes.



ATFM Daily Plan - Tuesday 18 April 2023

ADP Version 3

airservices

Airport	Planned GDPs	Total Arr/Dep	Affected Flights	Total Ground Delay	Av. Ground Delay
YSSY	NONE	875	n/a	0	0.00
YMML	NONE	707	n/a	0	0.00
YBBN	NONE	590	n/a	0	0.00
YPPH-A	YPPH GDP-A 0030-1400	519	187	2,351	12.60
YPPH-D	YPPH GDP-D 2130-0030		99	755	7.60
Totals		2691	286	3,106	2.43

36 Hr Synoptic Forecast

* denotes a revision has taken place

ATFM Daily Plan Summary Notes

YSSY	Nil network risk(s) identified at this time. Midday Update: BRIEF DETAIL YSSY: Patchy cloud above 4000ft. Light ENE winds ATC ADVICE: 507 (259A/248D) movements remaining. Nil GDP in place. Some short-notice staffing issues this afternoon on Approach, but demand is still within capacity.
YMML	Rapid exit taxiway lighting being unserviceable could potentially have an impact in the evening if unable to use LAHSO. However, current demand is below runway 27 single runway rate. Midday Update: BRIEF DETAIL YMML: CAVOK, with moderate to fresh NNW winds. SHRA developing in the western TMA late this evening. ATC ADVICE: 415 (220A/195D) movements remaining. Nil GDP. Late afternoon peak will have three hours close to, but not exceeding, capacity.
YBBN	Rapid exit taxiway works from 0000-0600z lowering rates due to segregated operations. There is some risk for oversubscription during this period, however, recovery is also available. Midday Update: BRIEF DETAIL YBBN: CAVOK, moderate to fresh SE winds, light offshore SHRA. ATC ADVICE: 338 (194A/144D) movements remaining. Nil GDP, with plenty of spare capacity throughout the day.
YPPH	Nil network risk(s) identified at this time. Purely demand driven GDPs. Midday Update: BRIEF DETAIL YPPH: CAVOK, moderate ESE winds. ATC ADVICE: 353 (215A/138D) movements remaining. GDP in place until 1400UTC. NOTAM current for airborne delays in excess of ERSA until 0300UTC, with max delay 22mins. Afternoon/evening peak is very compacted for three hours - operators are requested to comply with COBTs as closely as possible in order to minimise airborne delay.
Other Significant	Refer NOTAM for latest estimated airborne traffic delay advice.
Change Summary:	[07:20pm] Version 1: Initial. [06:38am] Version 2: Updated weather and graphs [12:00pm] Version 3: Updated notes, weather and graphs

2.5 The benefits of MET CDM include:

- Using enhanced weather forecast information to determine pre-tactical arrival rates that better suit weather conditions on the day.
- Greater predictability between planned arrival rates the day before operations and the actual arrival rates on the day, which provides enhanced planning.
- Collaboration between meteorological experts across stakeholders builds understanding and consensus on the aviation implications.
- The process and business rules allow flexibility and responsiveness when setting arrival rates with consideration of weather constraints.
- Reduction in airborne delay (holding) saving fuel and money for airlines.

2.6 Airservices uses a software-based tool called ‘Harmony’ to manage GDP. Harmony accepts real-time updates to schedule data, either via flight plan submission, airline day of operations changes to scheduled departure times, or ATC live data. In accepting real-time updates, Harmony can display the most up-to-date demand/capacity information for any monitored airport, which in turn provides airlines, airports, and ATC with an enhanced capability to predict traffic management issues.

3. ACTION BY THE MEETING

3.1 Note the information contained in this paper.

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APPENDIX [A] Australian information sheet

Network Management – Balancing demand and capacity of Australia's aviation network

Airservices occupies a unique position in the heart of Australia's aviation ecosystem, working closely with our airline/airport customers, community, and industry to support the sustainable growth of aviation.

When it comes to Australia's aviation network, airspace and airports have limited capacity, akin to highways and city roads. Just like road traffic, air traffic can become congested. However, air traffic congestion is much more complex to coordinate, as we cannot simply stop aircraft.

Airservices' Network Coordination Centre (NCC) is tasked with managing the day-to-day demand for Australia's airspace and airports in close collaboration with all relevant stakeholders.

What is the process?

Step 1: Airlines send their flight schedules to the NCC the day prior to operations. Airports Coordination Australia (ACA), manages the allocation of slots for eight Australian airports, including Sydney, Melbourne, Brisbane, and Perth, upon which airline flight schedules are then based.

Step 2: Airservices establishes the available airport capacity though a collaborative process with the airlines and the Bureau of Meteorology. Factors which impact available capacity include adverse weather, including fog, thunderstorms and strong and/or gusty winds, airport and Airservices' infrastructure and systems unserviceability, including taxiway pavement failures, and Airservices' reduced service delivery.

Step 3: Airservices publishes this agreed-industry plan as a Ground Delay Program (GDP) to balance the demand with the available capacity, as established in the first two steps. The GDP instructs aircraft to wait on the ground for their turn to depart, aiming to reduce excessive airborne holding at the destination. This is a bit like traffic lights on a highway ramp restricting the flow of cars onto a busy road.

Throughout the day of operations, industry stakeholders work collaboratively to monitor the aviation network performance to respond to any events which put the network plan at risk. These include unforeseen adverse weather events and Airservices' reduced service delivery/infrastructure or system failures. In instances when these events impact the network performance to a sufficient degree to warrant action, an update to the GDP will be agreed-upon by industry.

airservices australia