



ICAO

Sixth Meeting of the Asia/Pacific Airport Collaborative  
Decision Making Task Force (APA-CDM/TF/6)  
*Video Teleconference, 28 to 30 April 2021*

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**Agenda Item 5: Integration of A-CDM with ATFM**

**INTEGRATION OF AIRPORT-COLLABORATIVE DECISION MAKING (A-CDM) WITH  
AIR TRAFFIC FLOW MANAGEMENT (ATFM) IN SINGAPORE**

(Presented by Singapore)

**SUMMARY**

This paper presents the integration of Airport-Collaborative Decision Making (A-CDM) with Air Traffic Flow Management (ATFM) in Singapore.

**1. INTRODUCTION**

1.1 A-CDM and ATFM each uses its own set of information to optimise operational predictability and can be implemented on a standalone basis, without requiring the information from each other. However, there are useful information which resides within both A-CDM and ATFM that would help each other to further optimise its operations. Optimal operational predictability can only be achieved, if both ATFM and A-CDM share a common set of integrated information for its operations.

1.2 The integration of ATFM and A-CDM network will complement each other and together, create a seamless air traffic environment. This would improve flight and ATM efficiency throughout the three phases of flight (arrival, turnaround and departure), benefiting all CDM partners. Ultimately, it will also improve overall passenger experience for the travelling community.

**2. DISCUSSION**

2.1 When considerations are made on integration between ATFM and A-CDM, exchange of operational information between the two systems needs to be enabled for ATFM information, flight updates, and departure information to be shared among the two systems.

ATFM and A-CDM Integration in Singapore

2.2 Below details a milestone approach which was taken by Singapore in identifying the required information exchanges for ATFM-ACDM integration. Each local ATFM-ACDM integration will unlikely be the same, as the system architecture and operational requirements will be different.

2.3 Using A-CDM milestones approach as a guideline for local ATFM-ACDM integration.

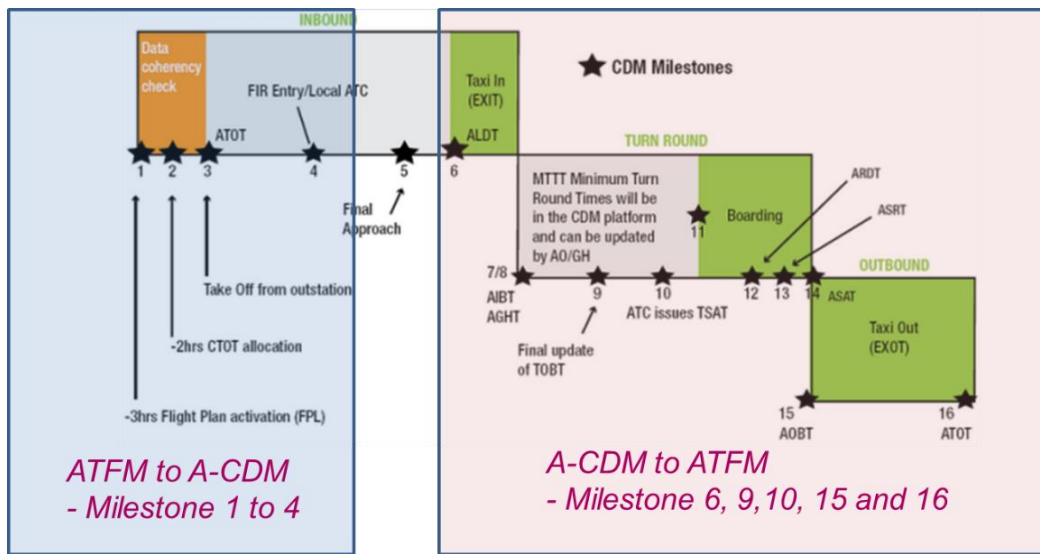


Figure 1. Milestone approach

Sharing of scheduled Departure and Arrival information from A-CDM to ATFM during the planning phase

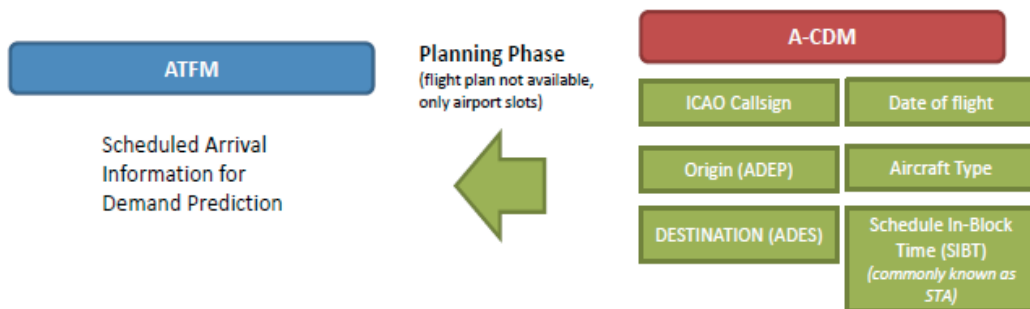


Figure 2. Arrival information (planning phase)

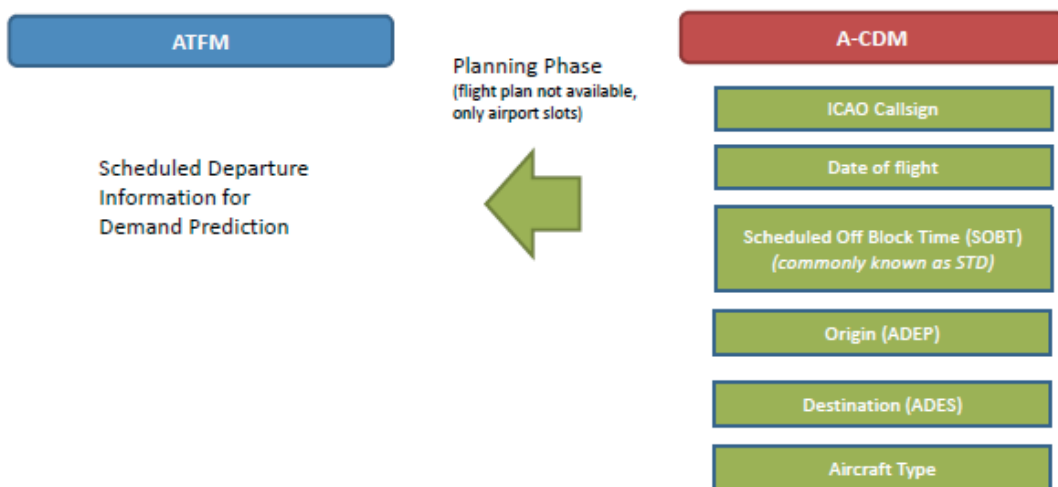


Figure 3. Departure information (planning phase)

2.4 Scheduled departure and arrival information (commonly known as airport slots) which resides in the A-CDM system are shared with ATFM system for traffic demand prediction. The scheduled information is critical for the ATM unit to conduct preliminary assessments on demand-capacity balancing in the strategic phase of ATFM implementation. With integration of ATFM and A-CDM systems, most updated information on airport slots are automatically being fed to the ATFM system, constantly updating the demand prediction.

Sharing of Departure information between ATFM and A-CDM during the pre-tactical and tactical phase

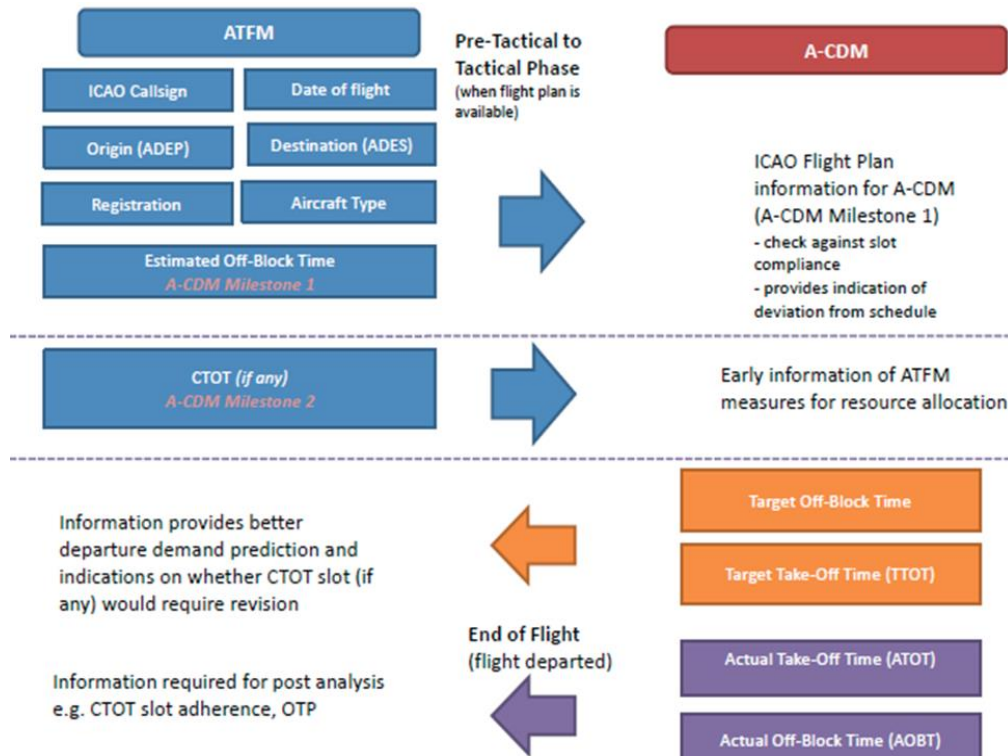


Figure 4. Departure information (pre-tactical and tactical phase)

2.5 EOBT within the ICAO Flight Plan (FPL) that is available in the ATFM system is sent to the A-CDM system and this helps to provide early indication on deviation from schedule timings, achieving the objectives of A-CDM Milestone 1. When ATFM measures are implemented, CTOTs generated by the ATFM system are shared with the A-CDM system. CDM partners will have early awareness of delays to departure due to ATFM restrictions, achieving the objectives of A-CDM Milestone 2.

2.6 The A-CDM system also shares the target and actual time references (A-CDM Milestones 9, 10, 15 and 16) with ATFM system. TOBT and TTOT can provide ATFM with more accurate real-time departure demand as compared to EOBT. The target times can also be used for planning purposes such as enabling early notification on whether the CTOTs could be comply with, allowing sufficient time for the ATFMU to coordinate for the necessary revision when needed. ATOT and AOBT updates the flight progress and supports the Post Operational Analysis (POA) stage towards the end of an ATFM measure. In addition, ATOT and TTOT when shared with the destination’s ATFM/ACDM systems, can help to fulfil A-CDM Milestone 3 requirement as well as facilitate a more accurate prediction of arrival time.

Sharing Arrival information between ATFM and A-CDM during the pre-tactical and tactical phase

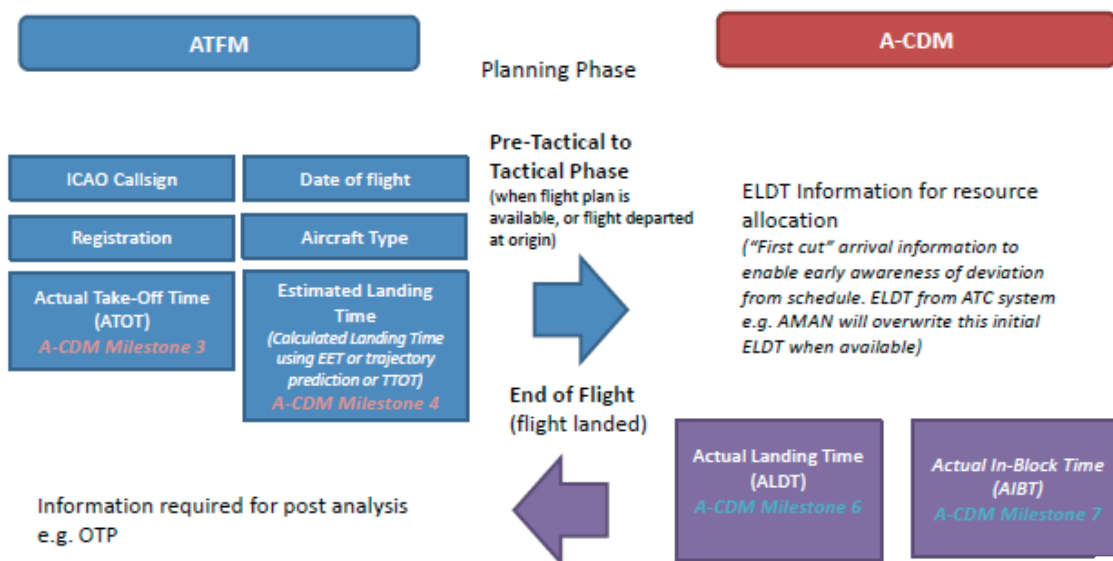


Figure 5. Arrival information (pre-tactical and tactical phase)

2.7 ATOT information received by the ATFM system will update the Estimated Landing Times (ELDTs) and this 'first cut' arrival information will be shared with the A-CDM system. When ATFM measures (i.e. Arrival GDP) are implemented, arrivals are expected to experience some ground delays at their departure aerodrome which would imply that there are possibilities of these affected flights deviating from their schedule or intended operating times. In such cases, ATFM system would also share the Calculated Landing Times (CLDTs) arising from the implemented ground delay, with the A-CDM system.

### 3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper;

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