International Civil Aviation Organization

Twelfth Meeting of the Air Traffic Management Sub-Group (ATM/SG/12) of APANPIRG

Bangkok, Thailand, 23 – 27 September 2024

Agenda Item 3: Performance Frameworks and Metrics

PROPOSED REGIONAL MONITORING AND REPORTING SCHEME FOR A-CDM IMPLEMENTATION IN THE ASIA PACIFIC REGION

(Presented by ATFM/IR/SWG)

SUMMARY

This paper presents the proposal of the Regional Monitoring and Reporting Scheme for A-CDM Implementation in the Asia Pacific Region.

1. INTRODUCTION

1.1 During the ATFM/SG/13 meeting, the following conclusion was agreed:

a) It was proposed to develop an annual regional monitoring and reporting scheme for the elements of the Asia Pacific A-CDM Implementation Plan and the task to be undertaken by ATFM/IR/SWG.

b) The meeting agreed to the proposal. The Chair reminded the ATFM/IR/SWG members to include A-CDM experts in the ATFM/IR/SWG for this task. IATA suggested that Airport Council International (ACI) might also be included in this matter, which was agreed by the meeting.

1.2 Hong Kong China, as the rapporteur of ATFM/IR/SWG, has organized two online meetings in March and August 2024 with draft reporting schemes to facilitate the discussions and gather suggestions among members of ATFM/IR/SWG. Representatives from the following member states/ administrations/ organizations participated in the meetings:

China, Hong Kong China, India, Indonesia, Japan, Malaysia, Mongolia, New Zealand, Republic of Korea, Singapore, Thailand, Vietnam, ACI, CANSO and IATA.

1.3 After consolidating comments received, Hong Kong China has prepared a proposal for the Regional Monitoring and Reporting Scheme for A-CDM Implementation in the Asia Pacific Region.

2. DISCUSSION

Elements of the Scheme

2.1 It was agreed during the online meetings that the proposed scheme should include the following elements:

a) Agreed basis for monitoring A-CDM implementation in the future

b) Traffic density for each particular reporting airport/ group of reporting airports

c) Flexibility in reporting content where items could be categorized as “Required” or “Optional”, with choice of “Not Applicable” as reporting response to cater for various scales and local needs of different airports in the region

Proposed Implementation Plan

2.2 The Regional Monitoring and Reporting Scheme is proposed to be implemented in two stages:

a) **First Stage:** All international airports in the regions are required to report implementation or planning for implementation status of A-CDM. Reporting for domestic airports in the region will be optional. Reporting for international airport without planning of and/or implementation of A-CDM would be accepted with justification. This is in line with the ICAO APAC Seamless ANS Plan which recommends all international aerodromes to consider implementation of A-CDM with integration to ATM.

b) To allow enough time to gather essential information so as to form an agreed basis for future A-CDM monitoring purpose, it is proposed that the first stage will last for initially ***three*** years, or when it is considered adequate information has been acquired to form basis of monitoring implementation status of A-CDM in the region.

c) During the reporting period of first stage, stakeholders are welcomed to provide suggestions on future reporting elements such as integration of A-CDM with ATFM system for cross border traffic management, consideration of airport capacity and demand during reporting of A-CDM implementation status, more detailed reporting metrices etc. The reporting form will be further developed and refined for use in next stage.

d) **Second Stage:** International airports in the regions are required to report implementation or planning for implementation status of A-CDM. Reporting for domestic airports in the region will be strongly encouraged. Basis for monitoring and updated information regarding A-CDM implementation status will be published periodically for reference by stakeholders.

e) Reporting for airports without planning of and/or implementation of A-CDM could be accepted with justification during both stages, with reference to ICAO NCLB initiatives.

Proposed Reporting Scheme

2.3 The proposal of the Reporting Scheme, sample reporting form as well as the reporting flow chart are included in the appendix of this working paper. It is proposed that the reporting date to be 28th of February each year, year 2025 would be considered as a trial year to collect essential information and comments to kickstart the analysis process.

2.4 The following A-CDM implementation status are proposed upon completion of reporting form: Not Applicable, Initiation, On-going, Partly Implemented, Fully Implemented.

2.5 The ATFM/IR/SWG seeks the support from the ATM/SG for the conduct of the Reporting Scheme in the year 2025.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) support the proposed Regional Monitoring and Reporting Scheme for A-CDM Implementation in the Asia Pacific Region;

c) support the implementation timeline for the proposed reporting scheme;

d) support the trial Reporting Scheme to be conducted in year 2025; and

e) discuss any relevant matters as appropriate.

…….

APPENDIX:

Proposal for ICAO Asia Pacific A-CDM Monitoring and Reporting Scheme

Background

In ATFM/SG/13, ICAO presented a brief on A-CDM implementation in APAC and a proposal to develop an annual regional monitoring and reporting scheme for the elements of the Asia/Pacific A-CDM Implementation Plan, noting that there was currently no mechanism for States to report implementation progress. The meeting was reminded of the ASBU (Aviation System Block Upgrades) elements of the GANP (Global Air Navigation Plan) related to A-CDM and Network Operations (NOPS), elements A-CDM- B0/1, B0/2, B1/1, and NOPS-B0/4, B1/3.

The meeting also noted the performance expectations related to A-CDM in the APAC Seamless ANS Plan, which recommends that all international aerodromes consider implementing A-CDM with integration to ATM. It was proposed to develop an annual regional monitoring and reporting scheme for the elements of the Asia Pacific A-CDM Implementation Plan and the task to be undertaken by ATFM/IR/SWG. The meeting agreed to the proposal. The Chair reminded the ATFM/IR/SWG members to include A-CDM experts in the ATFM/IR/SWG for this task. IATA suggested that Airport Council International (ACI) might also be included in this matter, which was agreed by the meeting.

As stated in the Manual of A-CDM Implementation by EUROCONTROL: *"Airport Collaborative Decision Making is the concept which aims at improving Air Traffic Flow and Capacity Management (ATFCM) at airports by reducing delays, improving the predictability of events and optimising the utilisation of resources. Implementation of Airport CDM allows each Airport CDM Partner to optimise their decisions in collaboration with other Airport CDM Partners, knowing their preferences and constraints and the actual and predicted situation. The decision making by the Airport CDM Partners is facilitated by the sharing of accurate and timely information and by adapted procedures, mechanisms and tools."*

On 19 March 2024, Hong Kong China, the Rapporteur of ATFM/IR/SWG organized an online discussion session with other ATFM/IR/SWG members as well as other stakeholders to present the first draft of the reporting scheme. Since then various comment has been received from different parties concerning the applicability of reporting elements on different airports, reporting format, expected outcome of reporting elements etc.

After consolidating the comments, draft reporting scheme [version 3.0] was proposed for circulation to members of ATFM/IR/SWG and other concerning stakeholders for comment. Having received further comment during the online discussion session on 29 Aug 2024, the reporting scheme is revised to draft version 4.0.

The New Draft Reporting Scheme

Based on the comment on first draft A-CDM reporting scheme, the following were concluded:

1. A **basis is needed** for monitoring A-CDM implementation in the future
2. **Not all reporting elements are applicable** to States with different airports operating at **various scales and local needs**
3. Aerodrome **traffic density** should be considered in the reporting scheme
4. Future reporting metrices to be based on **airport capacity and demand**
5. "**Phases of Planning for A-CDM Implementation"** and **"Phases of A-CDM Implementation"** should be clearly defined and reported:
    a. Phases of Planning for A-CDM Implementation (ICAO A-CDM Implementation Guidance)
        i. Initiation phase
        ii. Implementation phase
        iii. Operation and Monitoring phase
    b. Phases of A-CDM Implementation (EUROCONTROL A-CDM Implementation Manual)
        i. Information Sharing
        ii. Milestone Approach for the turn-round process (In-bound, turn-around and out-bound planning)
6. Reporting element to be categorized as "Required" and "Optional"

It is proposed that the reporting scheme to be introduced in stages as follow:

First Stage:

Require all international airports in the region to report implementation or planning for implementation status of A-CDM. Reporting for domestic airports in the region will be optional. Reporting for international airport without planning of and/or implementation of A-CDM would be accepted with justification (e.g. A-CDM is not required based on local situations of …)

The requirements are in line with the performance expectation of APAC Seamless ANS Plan version 3.0. The provision of initial stage of reporting would also provide ICAO with latest status of A-CDM implementation information to form basis needed to monitor A-CDM implementation in the future. This stage aims at collecting necessary facts and information for future refinement of the reporting scheme.

Suggested in the "Manual of A-CDM Implementation by EUROCONTROL": *'In the context of Airport CDM, credit can only be attributed to accurate and open disclosure of results, whether positive or negative. Improvements will only accrue if a no-blame culture is developed, where problems are revealed with the aim of reducing them and enabling others to learn from them.'*

The reporting scheme would be made as simple as possible. There will be no marking system to show "scores" achieved by individual airport. Instead, a status will be concluded after reporting to show the current A-CDM Implementation status of concerned airport. It is proposed that Stage 1 to last for ***initially 3 years***, or when it is considered adequate information has been acquired to form basis of monitoring the implementation status of A-CDM in the

region. The length of reporting period for Stage 1 will be subject to discussion and agreement among stakeholders.

Given the ICAO's No Country Left Behind (NCLB) initiatives, report from airports without implementation of A-CDM, or without planning of implementation of A-CDM would also be accepted with justification to give ICAO an overview of up-to-date situation of A-CDM implementation in the region. Also, considering of different local needs and resources available of domestic airports in the region, reporting scheme will be optional for domestic airports at this stage.

Second Stage:

Require all international airports in the region to report implementation or planning for implementation status of A-CDM. Reporting for domestic airports in the region will be strongly encouraged. Basis for monitoring and updated information regarding A-CDM implementation status will be published periodically for reference by stakeholders. Reporting for international airport without planning of and/or implementation of A-CDM could be accepted with justification.

As adequate information is collected, a basis to monitor the A-CDM implementation status could then be formulated and agreed among all stakeholders. More detailed reporting metrices, future reporting elements such as integration of A-CDM with ATFM system for cross border traffic management, consideration of airport capacity and demand during reporting of A-CDM implementation status (as suggested in previous online discussion session) etc. could be added into the reporting scheme during this stage. Reporting elements could also be refined prior to commencement of this stage.

Reporting for airports without planning of and/or implementation of A-CDM could be accepted with justification, with reference to ICAO NCLB initiatives.

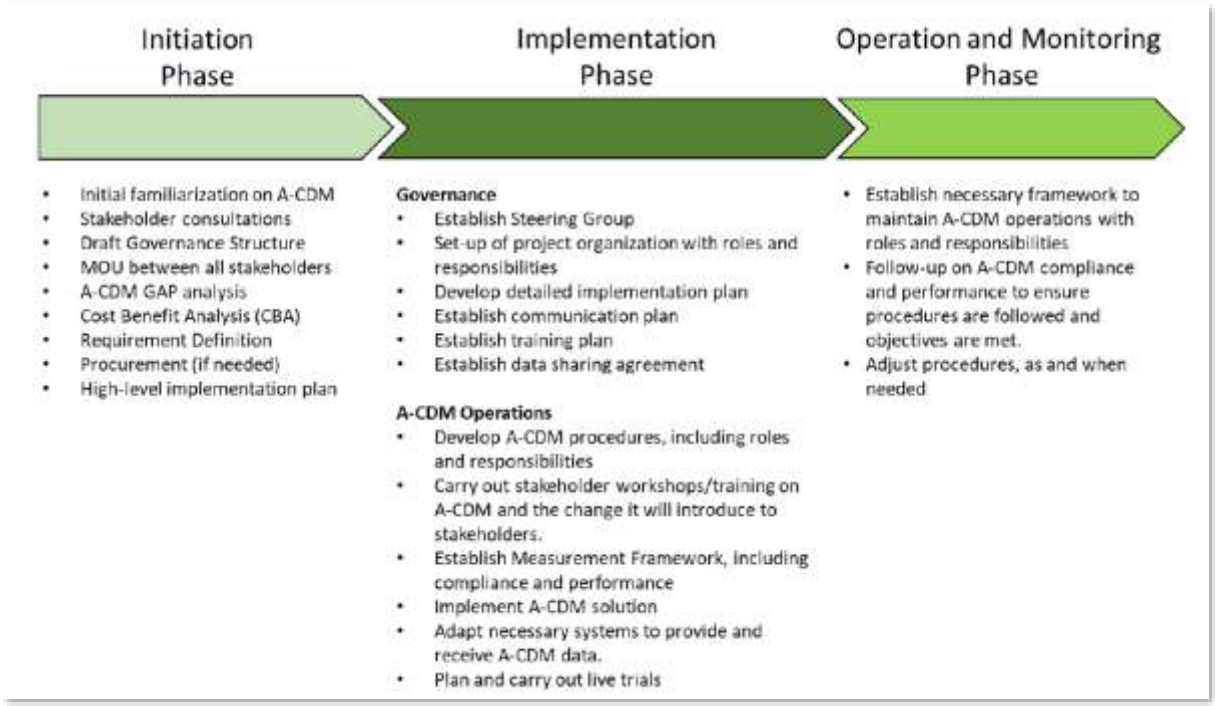
The New Draft Reporting Form

Part A (Basic Information):

To provide a better picture of A-CDM implementation, the following basic information is required along with the reporting elements:

- ICAO Airport Code
- International / Domestic Airport
- Aerodrome Traffic Density (Reference to ICAO Annex 14 Vol. 1)
    - **Light** (Where the number of movements in the mean busy hour is not greater than 15 per runway or typically less than 20 total aerodrome movements)
    - **Medium** (Where the number of movements in the mean busy hour is of the order of 16 to 25 per runway or typically between 20 to 35 total aerodrome movements)
    - **Heavy** (Where the number of movements in the mean busy hour is of the order of 26 or more per runway or typically more than 35 total aerodrome movements)

The reporting form will be airport based, i.e. States should report status of A-CDM implementation for different airports separately (Same as EUROCONTROL).



Part B (Phases of Planning for A-CDM Implementation):

ICAO A-CDM Implementation Guidance will be referred to. States should report the airport status as follow:

- Initiation Phase
- Implementation Phase
- Operation and Monitoring Phase

States could refer to the diagram on the right from ICAO A-CDM Implementation Guidance to determine their status. For airport with phases of "Implementation Phase" or "Operation and Monitoring Phase", Part C should be filled in.

Part C (Phases of A-CDM Implementation)

States are required to report if they have the A-CDM Information Sharing Platform, together with defined procedures agreed by the partners or not. Information Sharing is needed to be implemented prior to other A-CDM element since it is the core and foundation of the A-CDM concept.

Once the "Information Sharing" status is confirmed by States, the following reporting elements based on the "Milestone Approach", which is in line with the Milestones of A-CDM as stipulated in the ICAO Asia Pacific A-CDM Implementation Plan will be reported. The following diagram is extracted from the ICAO Asia Pacific A-CDM Implementation Plan for reference:

Overview of the 16 A-CDM Milestones from ICAO APAC A-CDM Implementation Plan is extracted as follow. States are required to report each of the "required milestone" related to "Inbound planning", "Turn Around planning" and "Outbound planning". This allows ICAO to analyze details of A-CDM implementation for each reporting airport upon data collection.

Milestone	Purpose of the Milestone	Milestone is triggered by	Data Elements	A-CDM Actions	Example of system(s) that typically has this data (and should share it)	Required/ Optional
MS1 ATC Flight Plan Activated	• Starts the A-CDM process for a flight • To check the data consistency between Airport Slot and Airline's flight plan data (EOBT vs SOBT, aircraft registration and aircraft type)	• ATC flight plan is submitted by Aircraft Operator (this happens typically at EOBT-3hrs but can also be later)	• Schedule Time of departure and arrival for the flight (STD/SOBT and ETA/SIBT) • Flight Plan EOBT • Gate/Stand	• Calculate: ELDT, EIBT, TOBT, TSAT, TTOT • Present/Disseminate: ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT	• TWR Flight Data Processing System • ACC Flight Data Processing System • AODB/RMS	• Required
MS2 CTOT Allocation	• To allow early awareness of departure delay if there are en-route/destination airport constraints Note 1: Multi-Nodal ATFM Trial currently issues CTOT at latest time of EOBT-1.5hrs Note 2: BOBCAT CTOT is available at EOBT-2hrs	• CTOT issued by relevant ATFM Unit/cross-border ATFM nodes	• CTOT	• Calculate: TSAT BASED on CTOT • Present/Disseminate: ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, CTOT	• ATFM System or similar capability	• Required for a fully integrated A-CDM – ATFM solution but not for a local A-CDM implementation
MS3 Take-off from Outstation	• To provide an ELDT at early stage by using FPL EET + ATOT. • To revise system generated TOBT, TSAT and TTOT if required • Allow early awareness of deviation from scheduled in-block time for resource planning.	• Take-off from up-station	• ELDT	• Re-calculate: EIBT, TOBT, TSAT, TTOT • Present/Disseminate: ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT	• ACC Flight Data Processing System • ACARS	• Optional
MS4 FIR Entry	• To estimate ELDT and prompt alert if potential gate conflict is anticipated. • To revise system generated TOBT	• Aircraft crosses a defined fix on FIR boundary or enters the FIR.	• ELDT	• Re-calculate: EIBT, TOBT, TSAT, TTOT • Present/Disseminate: ELDT, EIBT, EOBT,	• ACC Flight Data Processing System • Extended AMAN • ACARS	• Optional

Milestone	Purpose of the Milestone	Milestone is triggered by	Data Elements	A-CDM Actions	Example of system(s) that typically has this data (and should share it)	Required/ Optional
	• Allow early awareness of deviation from scheduled in-block time for resource planning.			SOBT, TOBT, TSAT, TTOT		
MS5 Final Approach	• To provide a highly accurate and stable ELDT/TLDT as landing sequence is confirmed • To revise system generated TOBT • Allow for awareness of deviation from scheduled in-block time for resource planning.	• Aircraft enters the TMA	• TLDT or ELDT	• Re-calculate: EIBT, TOBT, TSAT, TTOT • Present/Disseminate: TLDT/ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT	• ACC Flight Data Processing System • AMAN • ACARS	• Optional
MS6 Aircraft Landed	• To revise system generated TOBT • Allow for awareness of deviation from scheduled in-block time for resource planning.	• Aircraft touches down on runway	• Actual Landing Time (ALDT)	• Re-calculate: EIBT, TOBT, TSAT, TTOT • Present/Disseminate: ALDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT	• ACC Flight Data Processing System • AMAN • ACARS	• Required
MS7 Aircraft In-Blocks	• To revise system generated TOBT	• Aircraft arriving at the parking stand	• Actual In-Block Time (AIBT)	• Re-calculate: TOBT, TSAT, TTOT • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT	• A-SMGCS • Docking System • ACARS • AODB	• Required
MS8 Ground Handling Starts	• To revise system generated TOBT Note: For a normal turnaround flight MS8 and MS7 occur at the same time. MS8 and MS7 will not be the same for flights which are on the first operation of the day/are delayed/have been long term parked.	• Actual start of turnaround activities	• AGHT	• Re-calculate: TOBT, TSAT, TTOT • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT	• Same as MS7	• Optional

Milestone	Purpose of the Milestone	Milestone is triggered by	Data Elements	A-CDM Actions	Example of system(s) that typically has this data (and should share it)	Required/ Optional
MS9 TOBT Update	• Confirm and take control of TOBT • To check the feasibility of TOBT vs SOBT/EOBT.	• TOBT confirmation/update into A-CDM portal from EOBT-"X1" minutes Note: "X1" is need to be determined locally to fit the operations at the airport. Recommended to be 30 to 40 minutes.	• TOBT	• Re-calculate: TSAT, TTOT • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT	Manual input via: • A-CDM Portal • Mobile Apps • Airline/GHA systems	• Required
MS10 TSAT Issue	• To allow decision making based TOBT and TSAT values • Create a stable pre-departure sequence	• At TOBT – "X2" minutes, TSAT will be published Note: "X2" is need to be determined locally to fit the operations at the airport. Recommended to be 30 to 40 minutes.	• TSAT	• Re-calculate: TTOT • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT	• A-CDM/PDS	• Required
MS11 Boarding Starts	• To check if boarding has started as expected.	• Actual start for Boarding of passengers	• ASBT	• Re-calculate: - • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT	• AODB/RMS • Manual input in A-CDM Portal	• Optional
MS12 Aircraft Ready	• Post analysis to measure aircraft readiness against the TOBT • Automate removal of TOBT and TSAT based if rules are not followed based on local procedures	• The call from the pilot to ATC to report ready within "X3" minutes of TOBT Note: The value of "X3" is based on local procedures. "X3" is highly recommended to be +/5 minutes	• Actual Ready Time (ARDT)	• Re-calculate: - • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, ARDT, TSAT, TTOT	Manual input in • Electronic Flight Strip System • A-CDM portal/HMI	• Optional
MS13 Start Up Request	• To measure pilot's adherence to TSAT. • Automate removal of TOBT and TSAT based if rules are not followed based on local procedures	• The call from the pilot to ATC to request pushback/start-up clearance within "X4" minutes of TSAT. Note: The value of "X4" is based on local procedures. "X4" is highly recommended to be +/5 minutes	• Actual Start-up Request Time (ASRT)	• Re-calculate: - • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, ARDT, ASRT, TSAT, TTOT	Manual input in • Electronic Flight Strip System • A-CDM portal/HMI	• Optional

Milestone	Purpose of the Milestone	Milestone is triggered by	Data Elements	A-CDM Actions	Example of system(s) that typically has this data (and should share it)	Required/ Optional
MS14 Start Up Approved	• To measure ATC's adherence to TSAT • Automate removal of TOBT and TSAT based if rules are not followed based on local procedures	• The call from ATC to pilot to give clearance for push and start clearance within "X5" minutes of TSAT. Note: The value of "X5" is based on local procedures. "X5" is highly recommended to be +/5 minutes	• Actual Start-up Approve Time (ASAT)	• Re-calculate: - • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, ARDT, ASRT, TSAT, ASAT, TTOT	Manual input in • Electronic Flight Strip System • A-CDM portal/HMI	• Optional
MS15 Off Block	• To check if the aircraft has gone off blocks as per TSAT • Update Target Take-Off Time (TTOT) generated by DMAN/PDS if required	• Aircraft commence pushback	• Actual Off Block Time (AOBT)	• Re-calculate: TTOT • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, AOBT, TTOT	• A-SMGCS • Docking System • ACARS • Manual input	• Required
MS16 Take Off	• End of A-CDM process and relevant stakeholders are updated with the take-off information. • Flight is removed from the A-CDM process	• Aircraft lift-off the runway	• Actual Take-Off Time (ATOT)	• Re-calculate: - • Present/Disseminate: ALDT, AIBT, EOBT, SOBT, AOBT, ATOT	• A-SMGCS • ACARS	• Required

Finally, on completion of the reporting scheme, the following A-CDM Implementation status are suggested to represent the reporting status of the airport:

1. Not Applicable
2. Initiation
3. On-going
4. Partly Implemented
5. Fully Implemented

Sample reporting form and reporting flow chart are attached in the following section for reference and comment.

Sample Reporting Form

ICAO Asia Pacific A-CDM Monitoring and Reporting Scheme

Reporting Year: 2025

Part A (Basic Information)

1. ICAO Airport Code(s): _____

   (Airports within the same State/ Administration with same status could be reported in a single form)

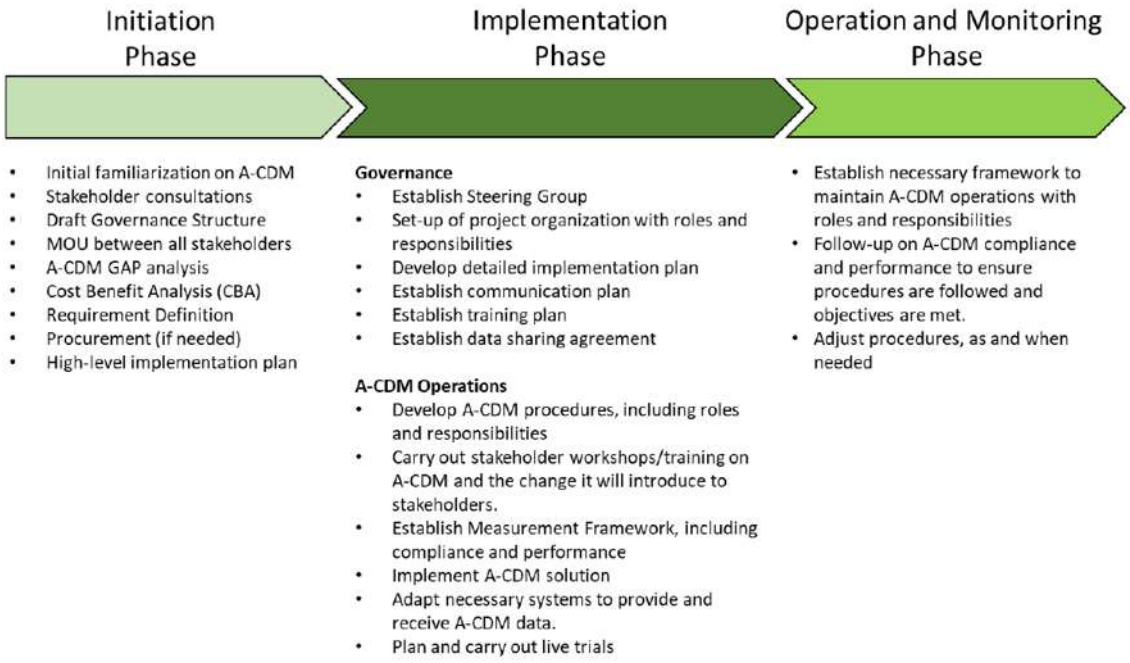
2. Category
   a. ☐ International Airport
   b. ☐ Domestic Airport

3. Traffic Density (reference to ICAO Annex 14 Vol.1)
   a. ☐ Light (less than 20 per hour)
   b. ☐ Medium (20 – less than 35 per hour)
   c. ☐ Heavy (more than 35 per hour)

4. A-CDM Planned/ Implemented?
   a. ☐ Yes (proceed to Part B)
   b. ☐ Not Applicable (provide justification below if "International Airport" is selected for Question 2) → End of reporting
   (Justification: _____)

Part B (Phases of Planning for A-CDM Implementation)

Select the phase according to the diagram below (extracted from ICAO A-CDM Implementation Guidance)



5. Phases of Planning for A-CDM Implementation
   a. ☐ Initiation Phase → End of reporting
   b. ☐ Implementation Phase → Proceed to Part C
   c. ☐ Operation and Monitoring Phase → Proceed to Part C

Part C (Phases of A-CDM Implementation)

6. Is an A-CDM information sharing platform available?
   a. ☐ Yes → Proceed to Question 7
   b. ☐ No → End of reporting

7. Report the implementation status according to the 16 milestones suggested in ICAO APAC A-CDM Implementation Plan

Milestone	Required/ Optional	Implementation Status		
		Not Applicable	Partly#	Completed
MS1 ATC Flight Plan Activated	**Required**	☐*	☐*	☐
MS2 CTOT Allocation	**Required** @	☐*	☐*	☐
MS3 Take-off from Outstation	*Optional*	☐	☐	☐
MS4 FIR Entry	*Optional*	☐	☐	☐
MS5 Final Approach	*Optional*	☐	☐	☐
MS6 Aircraft Landed	**Required**	☐*	☐*	☐
MS7 Aircraft In-Blocks	**Required**	☐*	☐*	☐
MS8 Ground Handling Starts	*Optional*	☐	☐	☐
MS9 TOBT Updated	**Required**	☐*	☐*	☐
MS10 TSAT Issue	**Required**	☐*	☐*	☐
MS11 Boarding Starts	*Optional*	☐	☐	☐
MS12 Aircraft Ready	*Optional*	☐	☐	☐
MS13 Start Up Request	*Optional*	☐	☐	☐
MS14 Start Up Approved	*Optional*	☐	☐	☐
MS15 Off Block	**Required**	☐*	☐*	☐
MS16 Take Off	**Required**	☐*	☐*	☐

refer to "A-CDM Actions" in Table 5 of ICAO APAC A-CDM Implementation Plan (2nd Edition)
★ please provide justifications/remarks below for choosing this status
@ for fully integrated A-CDM – ATFM solution, select "Not Applicable" for a local A-CDM implementation

Justifications/Remarks:

_____
_____
_____

Reporting Flow Chart