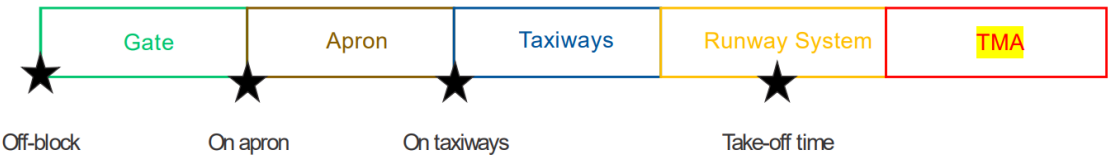
A-CDM MILESTONES PROCEDURE TEMPLATE

Introduction

The aerodrome airside system can be split into five modules, each facing distinct operational issues:

- airspace, or terminal maneuvering area (TMA)
- runway(s) system
- taxiways system from the runway(s) to the apron
- apron
- aircraft gates



Each module entry and exit can be associated to one or more specific milestone, defined as a timestamp. The milestones are categorized into 3 phases:

- Inbound phase
- Turnround phase
- Outbound phase

The purpose of the A-CDM is to optimize the processes related to aircraft ground operations (inbound; turnround and then outbound). An airport may choose to focus on the improvement of a specific milestone or set of milestones based on local challenges and constraints.

Chapter 4 -Implementation phase
Attachment 4.8

1.Objectives

Inbound phase

The purpose of A-CDM during the inbound phase is to enhance the distribution and use of advance arrival information to/by stakeholders when the flight is inbound to the airport.

For the inbound phase, A-CDM will:

a) enhance the calculation of the estimated in-block times, and consequently improve gate usage and position planning;
b) allow the verification of the feasibility of the outbound flight information for any arriving aircraft based on updated arrival information; and
c) enhance resource planning, e.g., ground handling.

Turnround phase

The purpose of A-CDM in the turnaround phase is to further improve the common situational awareness of all partners and to provide the most accurate estimation of departing aircraft readiness by using reliable off-block times, either EOBT or TOBT.

The use of a TOBT also allows for further enhancements to other A-CDM processes/procedures such as :

a) calculation of the predeparture sequence;
b) earlier indication that a flight will not be ready, e.g., TOBT cancellation in case of a technical problem with the flight;
c) updated information about target take-off times for ATFM, where applicable; and
d) enhanced use of other resources, e.g., gate and position planning

Outbound phase

The purpose of A-CDM for the outbound phase is to optimize planning of the departing flights.

A-CDM facilitates the sequencing of flights for departure and can assist ATC to sequence flights for the outbound phase(predeparture sequencing). The determination of accurate target start-up approval times (TSAT) is essential to allow traffic flows to be regulated as they move towards the runways more efficiently.

Chapter 4 -Implementation phase
Attachment 4.8

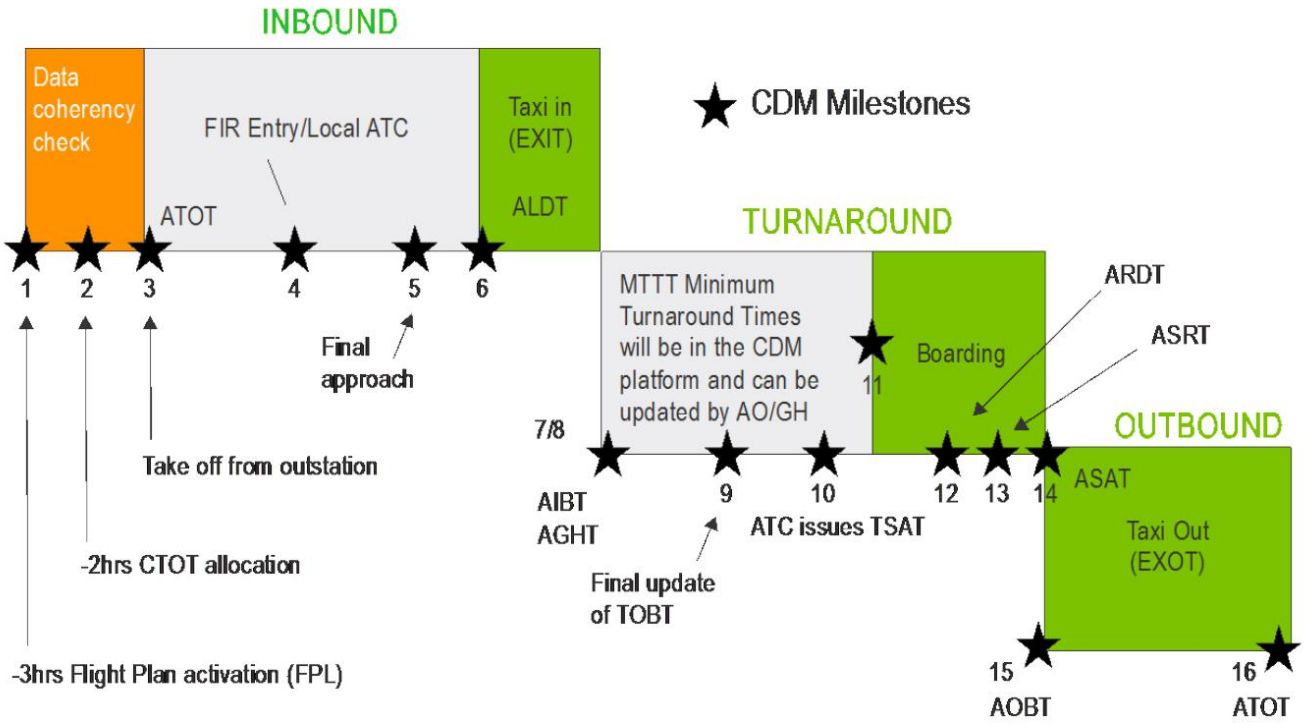
2. A-CDM milestones

In the A-CDM Process, 16 milestones are defined. The list of Milestones is indicative, more milestones may need to be included to cover for extra information updates on key events. Local procedures may dictate that some milestones may not be required and are therefore considered as optional.

It is important to note that not all 16 milestones have to be used for a successful A-CDM implementation at an airport, some are required and some are not highly recommended. Ultimately, which milestones are used dependent on the local A-CDM rules, procedures and data availability.

Note 1: The Milestones (MST) are numbered, but they may not necessarily occur sequentially.

Note 2: Milestones 1 and 2 are related to the outbound flight from the A-CDM airport and not related to the inbound flight coming to the A-CDM airport.



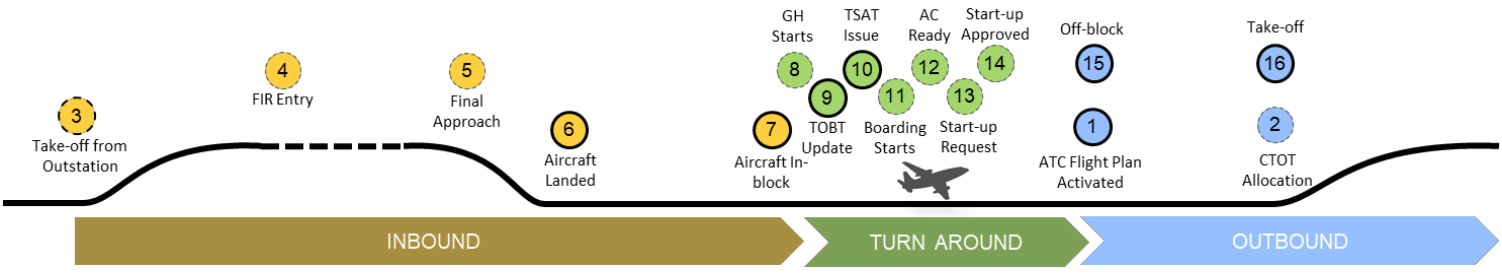
The following tables provides a comprehensive overview of the milestones including:

- What the purpose of the milestone is;
- How the Milestone is triggered;
- What data needs to be provided;
- A-CDM Actions;
- Example of system(s) that can provide the data; and
- Whether the Milestone is required or optional.

Chapter 4 -Implementation phase
Attachment 4.8

A-CDM milestones: List and detailed description

Number	Milestones	Time Reference
1	ATC Flight Plan activation	3 hours before EOBT
2	EOBT – 2 hr	2 hours before EOBT
3	Take off from outstation	ATOT from outstation
4	Local radar update	Varies according to airport
5	Final approach	Varies according to airport
6	Landing	ALDT
7	In-block	AIBT
8	Ground handling starts	ACGT
9	TOBT update prior to TSAT	Varies according to airport
10	TSAT issue	TOBT -30 mins to -40 mins
11	Boarding starts	Varies according to airport
12	Aircraft ready	ARDT
13	Start up request	ASRT
14	Start up approved	ASAT
15	Off-block	AOBT
16	Take off	ATOT



Chapter 4 -Implementation phase
Attachment 4.8

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 *(to adjust to the local context of the airport)*
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 (ATOT)	• 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 *(to adjust to the local context of the airport*
	• 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 **(ALBT)**	• 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 (AIBT)	• 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 **(ACGT)**	• 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

Chapter 4 -Implementation phase
Attachment 4.8

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 *(to adjust to the local context of the airport*
MS9 TOBT Update (TOBT)	• 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 (TSAT)	• 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 (ABDT)	• 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 (ARDT)	• 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 (ASRT)	• 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

Chapter 4 -Implementation phase
Attachment 4.8

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 *(to adjust to the local context of the airport)*
MS14 Start Up Approved (ASAT)	• 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 (AOBT)	• 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 (ATOT)	• 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