Airport Collaborative Decision Making (A-CDM)

Procedure Manual

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Version 3

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Change summary

Version	Date	Change description
2	25 March 2025	Initial published copy
3	26 March 2025	Correction to cover page Endorser and Approver

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1 Purpose

The purpose of the A-CDM Procedure Manual is to:

- Provide an overview of Airport Collaborative Decision Making (A-CDM) and how it will operate at Brisbane, Sydney (Kingsford Smith), Melbourne (Tullamarine) and Perth airports
- Define the A-CDM concept elements
- Describe responsibilities for A-CDM users
- Provide generic A-CDM operating procedures.

2 A-CDM Objectives

A-CDM is designed to optimise airport operations and the use of resources and improve the predictability of events. Increased predictability can be of significant benefit for airport and network operations, raising both productivity and cost efficiency.

Systems integration, a common operational picture, accuracy of data and improved business procedures are all critical to the success of A-CDM. Successful collaborative approaches to planning, performing and managing will require cultural and procedural change within and across A-CDM stakeholder organisations.

The objectives of implementing A-CDM in Australia are to:

- Improve predictability
- Improve on-time performance
- Optimise use of resources
- Optimise the use of airport infrastructure
- Improve Air Traffic Flow Management (ATFM) compliance
- Reduce taxi-out times
- Reduce recovery time from adverse events
- Improve network management.

2.1 A-CDM Stakeholder Objectives

The following outlines the objectives for each of the A-CDM stakeholders from the implementation of the A-CDM Service (technology and new ways of working).

Table 1 – A-CDM Stakeholder Objectives

A-CDM Stakeholder	Objectives
Aircraft Operator	• Daily programs of flight operations and turnaround times to meet schedule • Possible schedule disruptions predicted early thus managed efficiently • Preferences and priorities considered to optimise departures • Enhanced predictability leading to optimisation of resource utilisation • Transparency in airport flight operations to make earlier decisions • Improved awareness of the status and location of an aircraft • Accelerated operational recovery in adverse conditions or other disruptions

A-CDM Stakeholder	Objectives
Aircraft Operator	• Improved planning and use of bays/stands to provide efficient use of infrastructure and fewer late bay changes • Improved departure sequence information upon which to make decisions • Fuel savings due to reduced taxi delays and queuing at the runway threshold
Airport Operator	• Increased departures and arrivals punctuality and airport slot adherence • Improved planning and use of bays/stands to provide efficient use of infrastructure and fewer late bay changes • Accelerated operational recovery in adverse conditions or other disruptions • Reduced environmental impact e.g. emissions and noise • More stable traffic flows and reduced taxi times enabling fewer queues for departure and less congestion on the apron or taxiways
Designated Ground Handling Organisation	• Enhanced punctuality of operations based on earlier access to information • Optimised resource management based on real time data • More accurate in block times for arrivals, as well as better awareness of the exact time a departing aircraft is expected to be given start-up/pushback clearance
Air Traffic Control	• Reduced apron and taxiway congestion through reduced number of aircraft moving simultaneously on the manoeuvring area • Enhanced utilisation of runway for departures • Reduction in runway/taxiway congestion leading to improved service levels • Smooth flow of traffic reducing Air Traffic Controller workload
Air Traffic Flow Management	• Enhanced Calculated Take-Off Time (CTOT) compliance • Optimum utilisation of available capacity reducing sector (airspace divisions) overloads • More accurate take off time predictions enabling more precise calculations of network demand • Enhanced flow and capacity management will allow for tactical releases due to better visibility of demand, improved compliance and a reduced number of missed slots

3 Scope

This document describes the A-CDM procedures for the following:

- All airport stakeholders who are involved in, or need to be aware of, the arrival, turnaround and pre-departure sequencing of an aircraft at an A-CDM airport.
- All IFR fixed wing Aircraft Operators at an A-CDM airport, including freight and business operations.

The following flights are exempt from A-CDM procedures:

- Emergency
- MEDEVAC, FFR, SAR
- HOSP

- HEAD
- ATFMX

A-CDM stakeholders are responsible for ensuring that they update their own local work procedures and instructions to comply with these procedures for A-CDM airports.

4 Document Context

The following defines the context for this document.

The ***A-CDM Operating Model*** provides the high level view of how A-CDM will operate in Australia. The A-CDM Operating Model is updated through approval of the A-CDM Operational Committee.

The high-level generic ***A-CDM To-Be Business Processes*** provide the detailed functional view of the future state business processes for A-CDM. The To-Be Business Process models provide generic processes to support A-CDM stakeholders to conduct their change analysis and determine how they need to transform from current state to future state.

The ***A-CDM Procedure Manual*** (this document) provides the detailed A-CDM milestone view of agreed industry A-CDM procedures to be implemented in Australia to enable the realisation of A-CDM benefits for industry.

A-CDM stakeholders will also need to describe procedures at a lower level of detail within their own operations to effectively support the implementation of the procedures defined in this Procedure Manual.

The Operational Committee is responsible for recommending operational improvements for the A-CDM Service and to review and endorse the Operating Model, Procedure Manual and business rules to ensure that the A-CDM Service meets aviation industry requirements.

The Service Advisor (Airservices) will provide the Operational Committee with recommendations to improve the A-CDM Service based on evidence from data and trend analysis.

Proposed functionality enhancements will be provided to the Industry Co-ordination Group for endorsement, if appropriate and within budget.

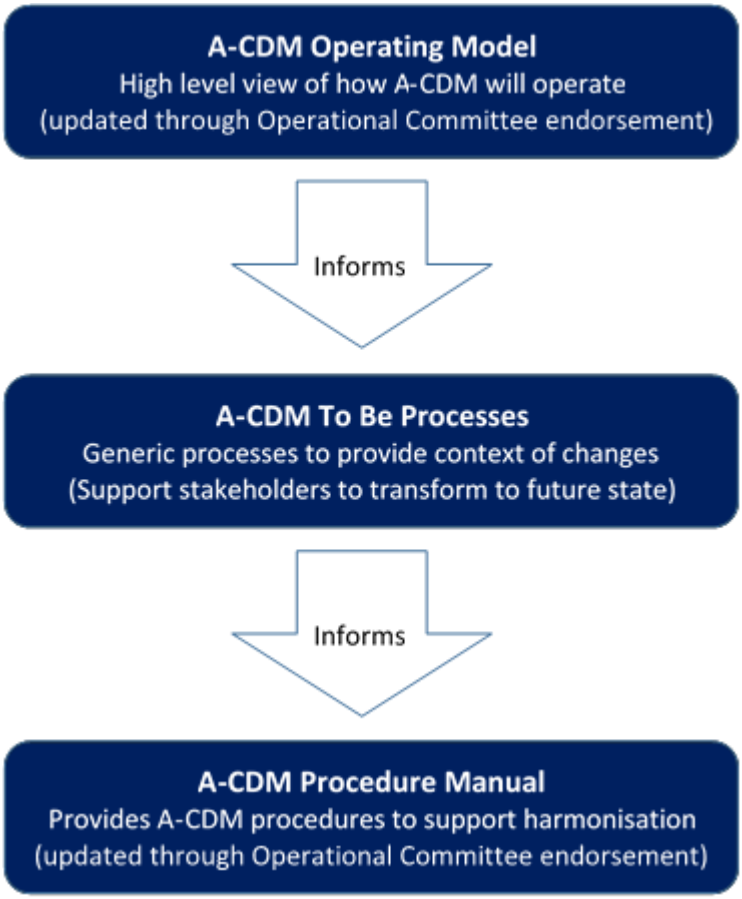


Figure 1 – A-CDM Documentation Context

5 Background

The concept of A-CDM is founded on operational procedures and integrated system capabilities to efficiently manage the airport arrival, turnaround and departure phases of a flight, all within Air Traffic Management (ATM) network flow management constraints.

It must be emphasised that A-CDM is not a “safety tool” and should not be seen as one. Its prime purpose is to improve efficiency at an airport and help to improve the network when integrated with ATFM. Thus, while the potential safety benefits of A-CDM that have been identified are valid, they should not be considered as “safety measures”.

A-CDM is based on a culture that emphasises airport stakeholders (Airservices, Airport Operators, Aircraft Operators and Ground Handlers) collectively working together and making decisions based on more accurate information, where all data elements necessary to support the defined A-CDM procedures are shared and have the same meaning for every stakeholder.

It is a new way of working which takes advantage of the ability to access real time information which supports improved pre-tactical and tactical planning to achieve common situational awareness. The aim is for the right decisions to be made by the right A-CDM stakeholder at the right time.

To fully realise the benefits of A-CDM, new ways of working will need to be adopted including:

- Agreed common terminology
- Agreed collaborative decision-making procedures
- Provision of accurate data in a timely manner to facilitate improved traffic predictability and planning
- Shared relevant and accurate data on traffic flows.

The A-CDM Program in Australia is a joint aviation industry initiative between Airservices, Aircraft Operators, Airport Corporations and stakeholders at four Australian Airports working towards a vision of:

"Airports, Aircraft Operators and Airservices Australia collaborating through real-time data sharing to optimise airport operations."

6 Design Principles

The following principles have been used to inform the collaborative design of the A-CDM operating model and reflect the drivers, priorities and preferences of the A-CDM stakeholders:

Table 2 – Design Principles

Design Principles	
Safety	Commitment to the safety of people, aircraft and facilities remains paramount
Accuracy	Data is updated (automatically and manually if required) as soon as practically possible to ensure a common operational picture
Efficiency	Minimise reliance on manual handling of (operational) data
Fairness	All stakeholders are equally valued, regardless of size or business model, in accordance with Aeronautical Information Publication Australia (AIP Publication) flight priorities
Performance	Optimise resource utilisation and reduce complexity of day-of-operations management through (better) collaborative planning and prioritisation
Process	Aircraft holding is generally given precedence at the gate (rather than on taxiways or in the air), informed by collaborative processes ATFM processes will continue to evolve in parallel with A-CDM
Cost	Reduce duplication of activities, systems and processes

7 A-CDM Concept Elements

The Australian implementation of A-CDM is based on the Eurocontrol definition of A-CDM which features the six **Concept Elements**. The Concept Elements support one another in the realisation of A-CDM capabilities.

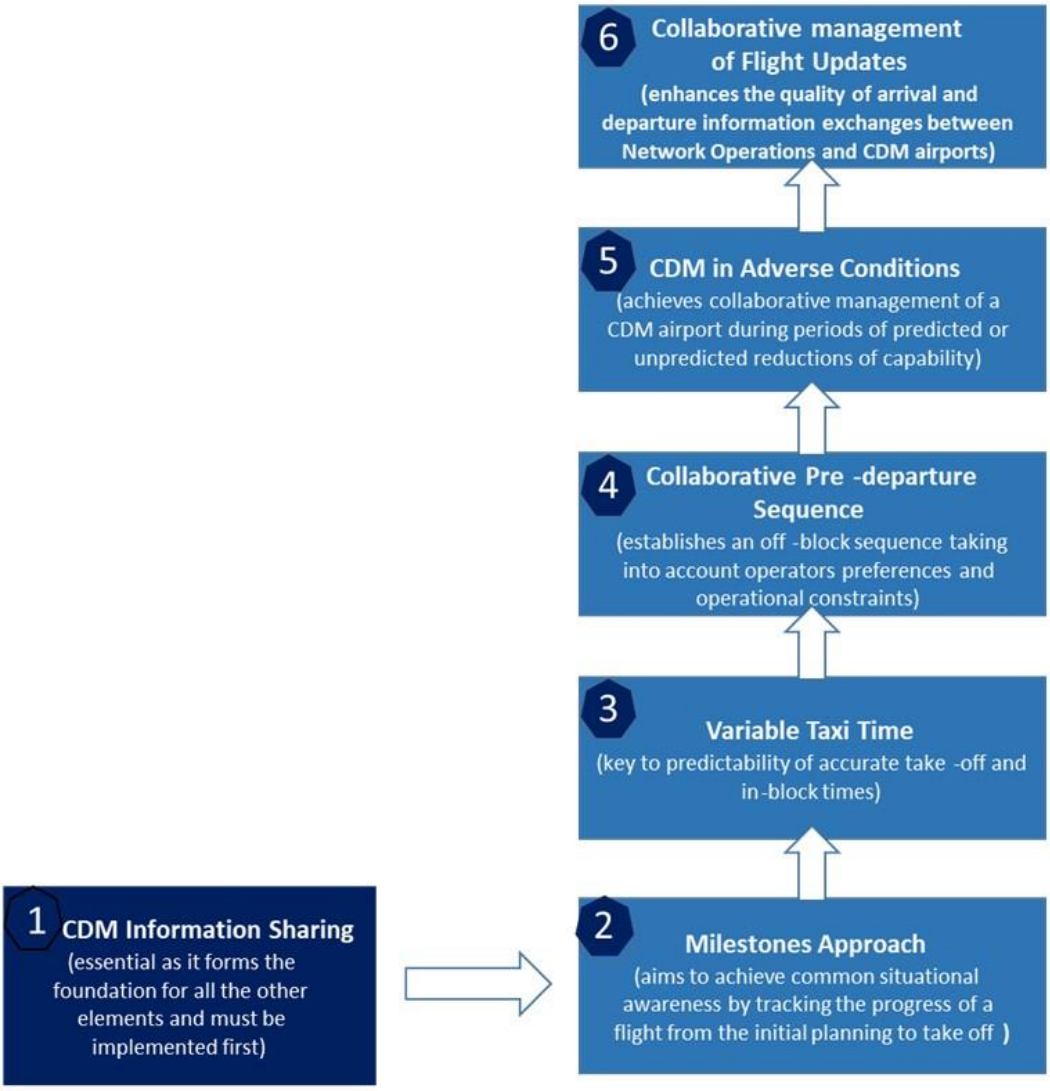


Figure 2 – A-CDM Concept Elements (Eurocontrol)

7.1 A-CDM Information Sharing

A-CDM **Information Sharing** is the foundation for the other elements designed to facilitate a common operational picture/situational awareness and improve traffic event predictability through the exchange and sharing of pertinent, accurate and timely information, collaboratively supplied by all A-CDM stakeholders. This includes data recording and performance analysis and provides the foundation upon which all the other A-CDM Concept Elements operate.

The A-CDM Information Sharing Platform (ACISP) aggregates information from multiple sources and integrates it into a suite of graphical tools that provide aircraft and flight details, shared situational awareness, current airport performance trends and statistics, airport and airspace conditions, historical reporting, and collaborative decision-making (CDM) tools and interfaces.

The ACISP compiles all A-CDM data (inbound, turnaround, outbound) from source systems, integrates relevant data sets, and distributes real-time data to A-CDM stakeholders to ensure a common operational picture and support associated operational/tactical decision-making.

With information sharing in place, each A-CDM stakeholder is able to access the total operational picture and, if needed, can react early to upcoming events.

7.2 Milestones Approach

The **Milestones Approach** (Figure 3) aims to achieve common situational awareness by standardised tracking of the progress of a flight, including initial planning. The Milestone Approach is designed to:

- Start and end the A-CDM procedures for any flight that arrives or departs from Brisbane, Sydney (Kingsford Smith), Melbourne (Tullamarine) or Perth airports
- Update information about a flight at certain points during the inbound, turnaround or outbound phase.

The Milestones Approach element describes the progress of a flight from the schedule received to take-off to enable close monitoring of significant events to achieve a common situational awareness and to predict the forthcoming events for each flight (off blocks and take off being the most critical events).

Milestones are critical components in A-CDM that require accurate times from reliable sources to ensure the integrity and consequent efficiency of the system. Common situational awareness and the ability to predict upcoming events and react to any changes in a timely manner particularly with regard to off blocks times are critical.

A successfully completed milestone will trigger information for downstream events and influence both the further progress of the flight and the accuracy with which the progress can be predicted.

The milestones help in identifying potential deviations from planning, trigger re-planning and allow collaborative decisions to be made. Milestones that are passed lead to an update of downstream time elements following agreed A-CDM procedures.

The most important time elements that are linked and updated at the passing of a milestone are:

- Estimated Landing Time (ELDT)
- Estimated In-Block Time (EIBT)
- Target Off-Block Time (TOBT)
- Target Start-Up Approval Time (TSAT)
- Target Take Off Time (TTOT).

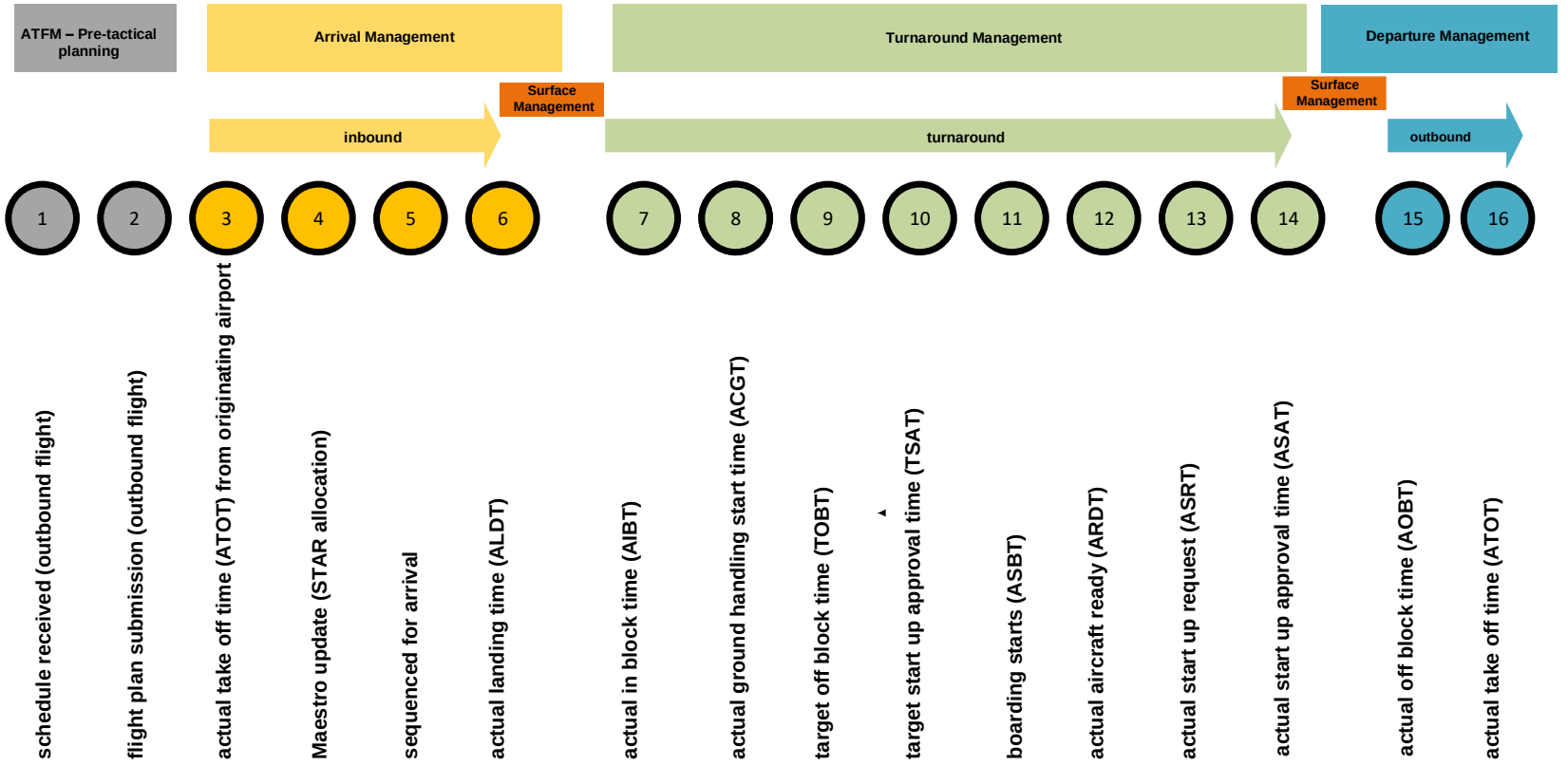


Figure 3 – A-CDM Milestones Approach

** Milestone 8 – Actual Ground Handling Start Time (ACGST) will not be used at this stage in Australia.*

7.3 Variable Taxi Time Calculator

The Variable Taxi Time (VTT) Calculator is the key to predictable and accurate estimates of in block and take off times.

VTT is the estimated time that an aircraft spends taxiing between its parking bay/stand and the runway or vice versa. VTT data takes into account:

- Route based on estimated optimal taxi route
- Aircraft parking position (stand/bay)
- Runway in use
- Aircraft type – for taxi speed
- Changing operational conditions.

For calculation purposes within the ACISP, estimated taxi times will be referred to as estimated taxi in time (EXIT) and estimated taxi out times (EXOT). Accurate estimated taxi times are required for calculating:

- Estimated In Block Time (EIBT)
- Estimated Take off Time (ETOT)
- Target Start-Up Approval Time (TSAT).

Actual taxi time is considered to be:

- Arriving flights – Actual Taxi In Time (AXIT) is the period between the Actual Landing Time (ALDT) and the Actual In Block Time (AIBT)
- Departing flights – Actual Taxi Out Time (AXOT) is the period between the Actual Off Block Time (AOBT) and the Actual Take Off Time (ATOT)

7.4 Pre-Departure Sequencing

Pre-Departure Sequencing (PDS) establishes a pre-departure sequence taking into account operators' preferences, wake turbulence, pre-set queue lengths (predicted number of aircraft between the gate and the holding point), runways in operation and operational constraints.

PDS uses the TOBT as the earliest time an aircraft can depart and assigns a TSAT which places each aircraft in an optimal PDS (off blocks).

The objectives of pre-departure sequencing are to:

- Reduce taxi-out delays
- Provide an optimised sequence
- Provide TSAT and TTOT predictability
- Reduce congestion on the manoeuvring area
- Improve CTOT slot adherence (for flights subject to ATFM restrictions).

7.5 Adverse Conditions

A-CDM will enable improved management during **Adverse Conditions** to enable a more timely return to normal capacity.

Leading into adverse conditions, collaborative decision making is predominately focussed on managing arrival demand through adjusting airport arrival acceptance rates and associated GDP revisions. The impact of departure demand may not be adequately considered. When recovering from adverse events, often large departure delays occur as arrival demand has been prioritised. Departure delays subsequently impact on the arrival flows at the destination airport. In some cases, the tactical arrival rate is lowered in order to clear (some of the) departure queue, which increases airborne delays. The impact of an adverse event at one airport, may therefore ripple unpredictably throughout the network and lengthen the time it takes for all stakeholders to recover.

With A-CDM, real-time operational information will be shared between all airport stakeholders. Combined with pre-departure sequencing, this provides improved visibility of real-time arrival and departure demand throughout the network. Where disruptions are expected to affect the system, caused by unplanned events such as weather, or short notice infrastructure unserviceability, collaborative management of the event will be coordinated through the National Operations Management Centre (NOMC). Collaborative decision making will be able to include considerations of arrival and departure balancing, to ensure a smoother recovery from an adverse event, and mitigate the impact on the remainder of the network.

For example, when a convective weather event is forecast to affect enroute traffic flows, necessitating a reduction in the arrival and departure rate from an A-CDM airport, the following workflow will occur:

- METCDM will be conducted advising on the impact of the convective weather
- The Tower Shift Manager (TSM) and/or TCU Shift Manager (SM), will collate critical information about the adverse condition and reduced capacity. Once all information is available, TSM and TCU SM (in consultation with ATMDs) will evaluate and identify the need to amend arrival and departure rates.
- The NOMC will coordinate a CDM teleconference with relevant A-CDM stakeholders. Achievable arrival and departure rates during the impact period of the convective weather are likely constrained by what ATC can facilitate, as advised by the TSM and TM (in consultation with the ATMD). Upon recovery, collaborative decisions can be made on arrival and departure demand balancing, as well as considering the impact of bay/stand availability on departure queues.

This process will also work for other variations where AO’s or airports identify factors which may lead to amended rates or changed capacity at an airport.

For example, in severe weather events with significant convective activity within the Terminal Control Area, the TSM in consultation with the TCU SM (in consultation with the ATMD) may reduce the departure rate to assist with managing aircraft diverting off standard routes to avoid weather. On resumption of normal operations, the TSM would be expected to reset the departure rate and the TTOT and TSATs calculations would eventually lead to a more normal capacity. Flight Crews would then comply with the new generated TSATs.

An adverse weather condition may prohibit personnel from attending to an aircraft for the preparation of a departure or arriving an aircraft to its gate. These weather conditions may encompass thunderstorms or strong wind conditions. An adverse weather condition will involve the activation of the local aerodrome Thunderstorm/Weather Warning System or a form of local communication protocols which require ground staff to evacuate the movement areas according to their Standard Operating Procedures.

The following actions must occur after the activation of the Weather Warning System:

Partner Responsibilities
1. NOMC MET, Virgin Meteorology (VMET) and Qantas Meteorology (QMET) will collaborate on an estimated time to resume personnel operations on the movement area. 2. NOMC will notify all partners of the forecast deactivation of the Weather Warning System via a Whispir message “(location) MOVEMENT AREA WEATHER WARNING FORECAST DEACTIVATION AT (time UTC)” 3. AO/DGHA: • Must update TOBT to be aligned with the resumption of ramp operations; or • If TOBT in automatic calculation phase, update ETD Carrier to the resumption of ramp operations Note: If the weather phenomena persists or conditions improve prior to the initial derived period, the above process from Step 3 must be repeated.

7.6 Collaborative Management of Flight Updates

Within the A-CDM context, **Collaborative Management of Flight Updates** refers to the integration of real-time airport operation information into the whole-of-network management, providing improved visibility of real-time arrival and departure demand throughout the network.

Practically this is realised by:

- Sending ATFM constraints from Harmony (CTOT) to the ACISP to provide early notification of ATFM constraints that may be applicable to departures from an A-CDM airport.
- Sending updated arrival time information from Harmony to the ACISP to provide an accurate estimate of arrival time at the destination airport, taking into account ATFM regulations (ATFM arrival slots).
- Integrating A-CDM into network management will bring benefits by improving the accuracy of flight information, as well as enabling a more collaborative approach to traffic management at a network level.
- Continued application of ATFM procedures and business rules for A-CDM airports.

8 Responsibilities

This section defines the responsibilities of the different stakeholders at an A-CDM airport.

Table 3 – Responsibilities

Responsibilities	AO	APOC	DGHA	ATC	NOMC	Flight Crew
Provide Flight Schedules	x					
Provide Flight Plans and subsequent updates	x					
Provide any change in registration of arriving or departing flights through CHG/FPL messages	x					

Responsibilities	AO	APOC	DGHA	ATC	NOMC	Flight Crew
Manage/Update TOBTs	x		(x)			
Ensure the Flight Crew is aware of the TOBT	x		(x)			
Ensure Flight Crew are aware of call ready and start up/pushback compliance windows	x		(x)			
Manage CTOT compliance	x					
Provide accurate and timely aircraft bay/stand allocation	x	x				
Provide accurate MTTT times	x					
Adhere to start-up & pushback procedures				x		x
Provide planned manoeuvring area closure notifications		x				
Monitor aircraft readiness against TOBT compliance	x					
Receive Flight Crew ready calls and record milestones				x		
Ensure start-up/pushback is issued in accordance with TSAT compliance				x		
Set all relevant parameters for the PDS to function i.e. queue lengths, runway and taxiway closures				x		
Update departure rates on day of operations				x		
Set Flow Control Restrictions				x		
Propose and set initial departure rates in PDS from MET-CDM					x	
Monitor traffic flows to and from A-CDM airports					x	
Coordinate balancing of demand and capacity					x	
Send and receive milestone information	x	x	(x)	x		x

(x) denotes that this responsibility can be delegated to this stakeholder to manage

9 Detailed Procedures – Milestones Approach

This section details information about the procedural elements of any flight for users that will operate under the A-CDM Milestones Approach for aircraft arriving and departing from Brisbane, Sydney (Kingsford Smith), Melbourne (Tullamarine) or Perth airports.

As described earlier, the concept element **Milestones Approach** aims to achieve common situational awareness by standardised tracking of the progress of a flight, including initial planning. More specifically the update of flight information at these milestones supports the A-CDM procedures as well A-CDM performance reporting.

The Milestones Approach tracks the progress of a flight through the ACISP by a continuous sequence of different events and rules for updating downstream information and the accuracy of the estimates. It is important to note that the ACISP will present the best and most accurate information that is available. When information changes it will trigger a change to the data being presented and disseminated to stakeholders.

In the Australian A-CDM context, **15 milestones are used** as depicted in Figure 4 below (Milestone 8 is not implemented).

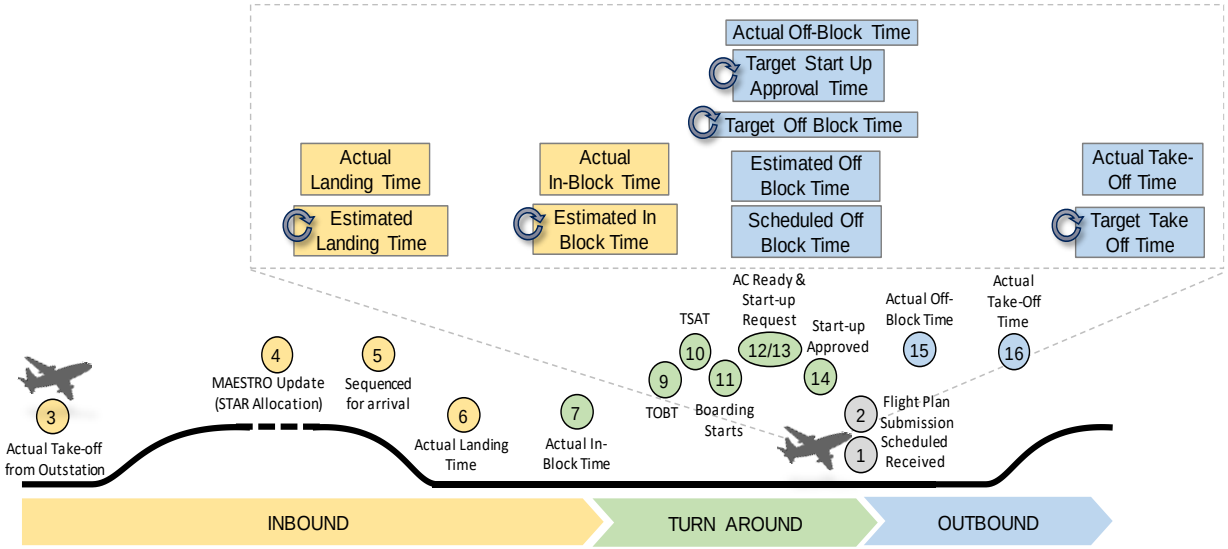


Figure 4 – A-CDM Milestones for implementation in Australia

9.1 Key principles: relationship between ETD, EOBT and SOBT

Scheduled Off Block Time (SOBT) means the time an aircraft is scheduled to depart from its parking position.

Estimated Off Block Time (EOBT) means the estimated time at which the aircraft will start movement associated with departure. It is also associated with the time filed by the aircraft operator in the flight plan.

Estimated Time of Departure (ETD) (EOBT Carrier) means the aircraft operator estimated time when an aircraft vacates its parking bay to begin taxi.

In order to ensure that a flight's flight plan information matches its schedule information, a number of checks will occur in the ACISP once the flight plan is activated and alerts will be issued if necessary.

The following checks will automatically occur throughout the A-CDM process:

- Check filed Flight Plan (EOBT) correlates to airport slot (SOBT)
- Check when no filed Flight Plan appears to be available or when multiple Flight Plans are filed for one and the same flight (e.g. different routings, call signs or times)
- Check if data for the filed Flight Plan matches SOBT data (e.g. aircraft type, destination, times)

If no flight plan (EOBT(ATC)) is received by 30 minutes from ETD (EOBT(Carrier)), or in the absence of ETD (EOBT(Carrier)) from the SOBT (ATC), the flight will be removed from the pre-departure sequence.

9.2 Two key milestones: TOBT and TSAT

There are two key A-CDM milestones which are critical to the A-CDM process. Based on an accurate prediction of aircraft readiness for departure – **TOBT** from the aircraft operator, or appointed designated ground handling agents, the PDS presents the optimal sequence of aircraft from the gates and an associated TSAT.

This dynamic mechanism between the prediction of when all ground handling activities will end, i.e. at the defined TOBT and the allocation of TSAT, are the core pillars of A-CDM at the designated A-CDM airports in Australia. This is also what it referred to as the **"best planned, best served" principle.**

The following sub-sections outline the key procedural elements and events to run A-CDM effectively.

9.2.1 Target Off Block Time (TOBT)

TOBT is defined as the time that aircraft operator and/or its ground handling agent estimate that an aircraft will be ready for departure – aircraft doors are closed, boarding bridge or stairs disconnected, pushback equipment in place and ready to start engines or pushback upon receiving an ATC clearance.

TOBT is the most important timing of the turnaround process and is essential for the calculation of TSAT. The TSAT is derived based on optimising aircraft ground movements and minimising apron congestion on taxiways.

TOBT can be predicted by tracking the flight events (or Milestones) that occur prior to landing and during the turnaround process. In order to achieve TOBT accuracy, close coordination of turnaround activities and sharing of operational information among different stakeholders is required.

TOBT is a 10 minute 'window of time' +5/-5 minute of the actual TOBT. The TOBT window is monitored for compliance.

9.2.1.1 Who is responsible for the TOBT?

A-CDM in Australia assumes that stakeholders involved in the turnaround process contribute to departure readiness. In order to get good quality TSATs, AO/DGHA need to ensure that a timely, accurate and stable TOBT is provided.

An *AO is* ***ultimately responsible*** for the management of TOBT. However, they can update the TOBT or assign this task to their DGHA on their behalf. In either case, it is the AO's responsibility to ensure the procedures and workflow coordinating TOBT submission is in place.

9.2.1.2 TOBT update process

AO and/or DHGA must understand and adhere to this process in reporting TOBT:

"Automation phase": For all scheduled flights the TOBT is initially set to equal the SOBT. For any flights with a linked inbound arrival, the TOBT will be automatically updated by the ACISP based on inbound arrival information as it is received.

Other sources of information can also affect the TOBT in the "Automation Phase", incl:

- An ETD (EOBT Carrier) from a data feed (Aircraft Operator) into the ACISP. This will update the TOBT value equal to ETD.
- An EOBT from the Flight Plan. This will update the TOBT value equal to EOBT only if the ETD has not been changed prior to the Flight Plan submission.
- The ELOBT (Carrier) updated via Metron Harmony will update the TOBT into the ACISP.

IMPORTANT: The ETD has higher priority than EOBT so will supersede any TOBT set using EOBT.

"Automatic confirmation" phase: The TOBT is automatically confirmed in the ACISP at the later of:

- ALDT of the inbound flight or
- ETD -30mins or
- EOBT -30mins if no ETD or
- SOBT -30mins if no ETD or EOBT (ATC)

After this TOBTs can ONLY be manually updated by the AO/DGHA.

"Manual update" phase: AO and/or DGHA to manually update TOBT if there is a change of 5mins or more. Manual updates can also occur when information is sent from a partner's native system, through the A-CDM Workspace or A-CDM Mobile Application.

9.2.1.3 When and how TOBT is generated?

TOBT calculation starts 20 hours before the Scheduled Off Block Time (SOBT) and will be continuously automatically updated based on the update of the ELDT, ALDT and AIBT. The ELDT, ALDT and AIBT updates will happen at pre-defined milestones all related to the arriving aircraft. These milestones are:

Table 4 – TOBT generation

Milestone No	Milestone Name	Purpose
3	Actual Take off Time (ATOT) from originating airport	When the ARRIVING aircraft takes off from the outstation, this will trigger an ELDT to be received in the ACISP, which in return will update EIBT, TOBT, TSAT, and TTOT.
4	MAESTRO Update (STAR allocation)	When the ARRIVING aircraft is within the AMAN (MAESTO) horizon, ~200 nm, this will trigger an ELDT to be received in the ACISP, which in return will update EIBT, TOBT, TSAT, and TTOT.
5	Sequenced for Arrival	When the ARRIVING aircraft is sequenced for arrival by AMAN (MAESTO), this will trigger an ELDT to be received in the ACISP, which in return will update EIBT, TOBT, TSAT, and TTOT.
6	Actual Landing Time (ALDT)	When the ARRIVING aircraft lands at the A-CDM airport this will trigger an ALDT to be received in the ACISP, which in return will update EIBT, TOBT, TSAT, and TTOT.
7	Actual In Block Time (AIBT)	When the ARRIVING aircraft parks at the A-CDM airport this will trigger an AIBT to be received in the ACISP, which in return will update TOBT, TSAT, and TTOT.

IMPORTANT: It is very likely that the predictions of TOBT, TSAT, and TTOT will be more accurate as the arrival flight passes through the phases of flight and defined Milestones.

9.2.1.4 Why is a manual TOBT needed?

The ACISP generated TOBT may not accurately predict when the aircraft is ready for departure, especially for cases of delays caused by turnaround activities. As a result, AO/DGHA are required to continuously assess the operational situation and update TOBT if needed (i.e. if outside compliance window of -5/+5mins).

9.2.1.5 When to manually update the TOBT?

1. TOBT can be manually updated whenever required throughout the whole A-CDM process. If this is done, the TOBT is in the “Manual update” phase and the AO/DGHA is in control of the TOBT and must continue to update it if required.
2. Hence, after the TOBT is in the “Manual update” phase, the TOBT needs to be monitored and actively updated if there is a change of 5mins or more from the current TOBT based on the progress of the turnaround activities (see Figure 5 overleaf).

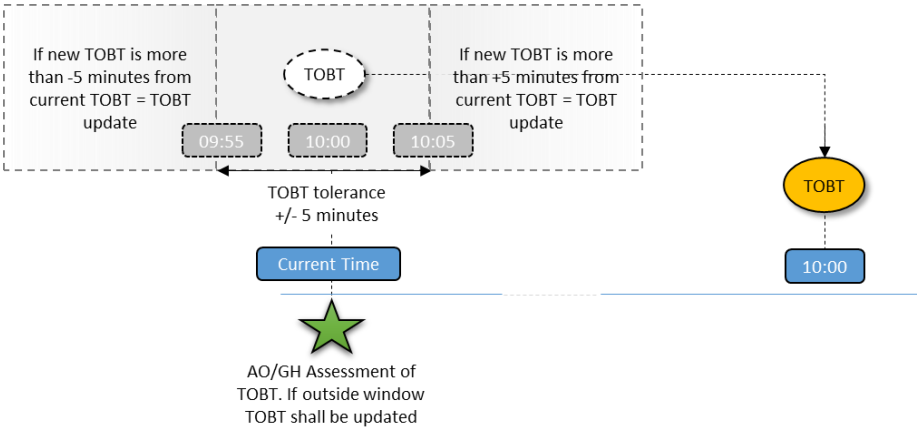


Figure 5 – Manually updating TOBT

9.2.1.6 What systems support the TOBT update?

There are three ways to update the TOBT:

- via the A-CDM Workspace available to A-CDM stakeholders.
- via the A-CDM mobile application available to the A-CDM stakeholders.
- via the AO's native systems (where interfaces have been established).
- via the ELOBT from Metron Harmony.

9.2.1.7 How will TOBTs be disseminated to all stakeholders?

Table 5 – TOBT dissemination

20 hours to 3 hours before departure	3 hours to ALDT or 30mins before departure	From the later of ALDT or 30 mins up to TOBT window
• TOBT visible via A-CDM Workspace • TOBT visible via aircraft operator/airport operator native systems		• TOBT visible via A-CDM Workspace • TOBT visible via aircraft operator/airport operator native systems • TOBT visible via A-CDM mobile application

9.2.1.8 Loss of TOBT

If the aircraft calls late (> +5 TOBT window), the aircraft will lose its TOBT and need to get a new TOBT which may result in the issuing of a new TSAT.

9.2.2 Target Start-Up Approval Time (TSAT)

TSAT is defined as the time at which the flight crew can expect engine start or pushback approval from ATC.

The TSAT compliance window commences from TSAT – 5 mins and aircraft will receive start or pushback approvals as operations permit. The TSAT window is monitored for compliance.

The PDS calculates the TSAT, taking into account TOBT and/or the local traffic situation and possible Calculated Take-Off Time (CTOT)s, that an aircraft can expect start-up/pushback approval.

With A-CDM, the target is to improve the predictability of runway demand from the TOBT and aim to determine an optimal pushback sequence to ensure smooth take-offs at the runways.

By adopting pre-departure sequencing, A-CDM stakeholders can expect to reduce the aircraft waiting time at the runway holding points, reduce fuel consumption on the taxiways and improve the passenger experience by having a smoother departure flow.

9.2.2.1 Which flights are planned and not planned by PDS?

Table 6 – Flights planned by Pre-Departure Sequencer (PDS)

Planned by PDS
• IFR fixed wing flights that depart from any of the A-CDM airports (including Business and General Aviation) • Exempt, VFR and Rotary aircraft • The flight has a flight schedule and flight plan • The flight plan is available (i.e. present in the ATC system) • The flight's TOBT is known
Not planned by PDS
• A flight that is suspended and will not take part in the planning process. • Flights that return to the stand after pushback (this does not apply to remote holding). An updated TOBT (where TOBT should be > current time) will reactivate the flight in the PDS. • Flights exempt from A-CDM

9.2.2.2 When does TSAT calculation start?

The PDS will start to calculate a TSAT at SOBT -20 hours based on the TOBT and other defined constraints. A TTOT will also be calculated in conjunction with the TSAT calculations.

The calculations/updates to TSAT follow the same update process as for the TOBT in relation to Milestones. Hence, TSAT (and TTOT) will be updated at Milestones 3 – 7.

As for the TOBT, predictions of TSAT (and TTOT) will become more accurate as the arrival flight passes through the phases of flight and defined Milestones.

9.2.2.3 When does the TSAT become stable?

TSAT's are automatically calculated by the ACISP from SOBT -20 hours. At TSAT -30mins, the **TSAT will become stable** (triggering Milestone 10) and from that moment, changes will only occur under very limited conditions, e.g.:

1. if the TOBT is updated beyond TSAT
2. if a flight earlier in the sequence is cancelled or its TOBT moves it later in the sequence creating an opening earlier in the sequence,
3. if the runway configuration updated
4. if there is a flow control added/removed

5. if there is another system critical change that could drive a change to the sequence or departure queue overall.

Large variations in TSAT within the stable horizon should only occur as result of major changes to the sequence, such as unplanned runway changes and/or introduction/cancellations of low restrictions. Industry typically receives some advance notification by the NOMC for these events. Note that flow restrictions with large-minute-in-trail values could result in TSAT fluctuations within 30 minutes in the order of magnitude of the minute-in-trail value.

9.2.2.4 What happens with TSAT if TOBT is updated, not exceeding current TSAT?

The TOBT can be updated without affecting the TSAT **as long as TOBT is earlier than or equal to the TSAT value**. If the TOBT is later than the current TSAT, a new TSAT will be calculated.

9.2.2.5 When will the TSAT be made available to A-CDM stakeholders?

Table 7 – When is TSAT available to stakeholders?

20 hours to 3 hours before departure	3 hours to ALDT or 30mins before departure	From the later of ALDT or 30 mins up to TOBT window
• TSAT visible via A-CDM Workspace • TSAT visible via aircraft operator/airport operator native systems		• TSAT visible via A-CDM Workspace • TSAT visible via aircraft operator/airport operator native systems • TSAT visible via A-CDM mobile application

9.2.2.6 CTOT and relationship to TSAT

When a flight receives a CTOT, this directly affects the TSAT in order to ensure that start-up and pushback procedures are done in time to meet the CTOT.

The TSAT will be calculated so that the flight can meet the CTOT -5/+15mins window. The PDS does this by assigning a TTOT that is within the “CTOT window” and then calculating backwards, using the Variable Taxi Time and other parameters, resulting in a TSAT.

In the event of **Adverse Conditions** when limited departure capacity results in unequitable TSAT-delay assignment due to prioritisation of CTOT compliance, in exceptional circumstances the CTOT window of -5/+15 may be adjusted to a larger window to ensure an appropriate level of equity in TSAT-delay assignment for all departures (irrespective of holding a CTOT).

9.2.2.7 Priority of TSAT if CTOT is removed

The PDS will always try to give a better/earlier TSAT if the CTOT is removed. This means that a flight will get an earlier TSAT whenever possible, taking all known parameters into account.

In cases where an active decision has been made to update the TOBT to be aligned with the TSAT that is delayed due to a CTOT, the PDS will not be able to provide an earlier TSAT than the entered TOBT.

9.3 Business Rules

The A-CDM Business Rules detailed below define specific rules to which A-CDM stakeholders need to comply.

Table 8 – Business Rules

Business Rule
ATFM and CTOT
All ATFM Business Rules apply.
CTOT compliance window is -5/+15mins.
TSAT calculations will be affected by the assignment of a CTOT of a flight.
Once an aircraft is off blocks, compliance with CTOT no longer needs to be managed by the AO. If an aircraft returns to bay it will still need to comply with the new CTOT.
When a departure from an A-CDM airport is subject to both a GDP (CTOT) and tactical flow restriction (with a spacing of 5 minutes or larger), late non-compliance with the CTOT is allowed up to 30 mins.
Flight Plan
AO files a flight plan and sends updates in accordance with ICAO PANS. Subsequent changes to the Flight Plan are handled as: • File a Cancel (CNL) message: TOBT, TSAT and TTOT are automatically removed after 10mins (to allow for refile) OR • File a Delay (DLA) message: TOBT will be automatically updated (if not previously manually updated) OR • File a CHG message: TOBT will be automatically updated (if EOBT is changed).
The FPL is to be filed/activated from -3 hours to -45mins before SOBT.
If no flight plan (EOBT(ATC)) is received by 30 minutes from ETD (EOBT(Carrier)), or in the absence of ETD (EOBT(Carrier)) from the SOBT (ATC), the flight will be removed from the pre-departure sequence.
Flight Plan refile time is 10mins.
TOBT
TOBT should only be updated if there is a difference of 5mins or more.
Manual updates to TOBT must be at least 5mins later than the current time.
TOBT can be manually updated by the AO/DGHA at any time. If this is done the TOBT is in “Manual Update” mode and the AO/DGHA are in control of the TOBT and must continue to monitor and update if required.
TOBT can be updated without affecting TSAT as long as the TOBT is earlier or equal to the TSAT. If the TOBT is later than the current TSAT then a new TSAT will be calculated.
Irrespective of the TSAT, the aircraft must be ready for departure at TOBT -5/+5mins as the TSAT may be revised forward at short notice.
TOBT and TSAT will be removed if the Flight Crew do not call for start / pushback within the TOBT window (-5/+5mins) and a new TOBT will need to be entered to generate a new TSAT.

Business Rule
The TOBT is automatically confirmed in the ACISP at the later of: • ALDT of the inbound flight **or** • ETD -30mins **or** • EOBT -30mins if no ETD **or** • SOBT -30mins if no ETD or EOBT (ATC) After this, TOBTs can ONLY be updated by the AO through a data feed, or manually updated by the AO or DGHA.
Flight Prioritisation: AO/DGHA shall effect flight prioritisation within their own group by entering a priority on a flight or updating the TOBT.
TSAT
TSAT will become stable at -30mins but can change under certain conditions (i.e. ATFM restrictions are changed, change of runway or if TOBT is updated beyond TSAT).
TOBT can be updated up until TSAT without affecting the TSAT.
The Flight Crew is to call when ready at TOBT compliance (-5/+5mins). If the Flight Crew calls early before the TOBT compliance window, they will be instructed to continue monitoring frequency.
If the Flight Crew calls late outside TOBT compliance (-5/+5mins) they will be advised to contact their AO/DGHA to obtain a new TOBT.
Once a Flight Crew calls when ready at TOBT, the TOBT cannot be updated to match the TSAT.
A late ASAT (> TSAT +5mins) will not result in a loss of TSAT.
Ground Return/Rejected Take off/Return to Field
For a ground return/rejected take off/return to field: • Whoever manages the bay/stand allocation must update this information in their system to flow through to the ACISP. • AO/DGHA must clear the A-CDM milestones (from TOBT to AOBT) via the A-CDM Workspace and update the TOBT to get the flight re-sequenced.

9.4 Alerts

Alerting is important so that information that is updated in the ACISP is validated and compliant within tolerances.

Alerts will be automatically generated/triggered in the A-CDM Workspace throughout the progress of flight based on the information received.

A-CDM stakeholders need to monitor alerts and resolve if required. If updated information is received and the alert is no longer valid it will disappear from the A–CDM Workspace.

Table 9 – Alerts

Alert No.	Alert Name	Description/Alarm Rule
01a	ATC Flight Plan Correlation Alert	Receive a new flight plan (first EOBT) for which there is no SOBT

Alert No.	Alert Name	Description/Alarm Rule
01d	Flight Plan Missing for Correlation Alarm	No flight plan has been received (i.e. no EOBT) to correlate an inbound flight to the outbound flight at SOBT -35mins (alert provided 5mins before flight is removed from pre-departure sequence at EOBT-30mins)
01e	Inbound/Outbound Flight Correlation Alarm	Unable to correlate an inbound flight to the outbound flight by the outbound flight's EOBT -60mins
01f	Flight Plan Airport Schedule Alert	Receive a new flight plan (first EOBT) and unable to correlate with Airport schedule flight data
02	Discrepancy between SOBT and EOBT	The difference between EOBT in flight plan or flight modification event and SOBT exceeds 60mins
03	Aircraft Type discrepancy	The aircraft type at SOBT does not match the filed flight plan (EOBT) aircraft type
04	Aircraft Registration discrepancy	The aircraft registration at SOBT does not match the filed flight plan (EOBT) aircraft registration
05	First Destination Discrepancy	The destination airport in the AODB and SOBT conflicts with the destination airport in the filed flight plan (EOBT)
06k	Non-Airborne alert	No take off at the airport of origin has been received for an arriving flight before SIBT/ELDT (whichever is later) -30mins and also not under surveillance
07	EIBT + MTTT discrepancy with EOBT	If the (EIBT or AIBT) + MTTT +5mins is later than the EOBT
08a	EOBT Compliance alert	If the difference between TOBT and EOBT exceeds 30mins
08b	ETD (EOBT Carrier) Compliance alert	If the difference between TOBT and ETD exceeds 20mins
9 (disabled at this stage)	ASBT compliance with TOBT	No ASBT received by 15mins before TOBT ASBT received but the ASBT value is later than TOBT -15mins
11a	Flight not Compliant with TOBT (Warning)	There is an imminent loss of TSAT as the ARDT has not been received within 2mins before the end of the TOBT window
11b	Flight not Compliant with TOBT (Alert)	The TSAT has been lost as the ARDT has not been received before the end of the TOBT window
12b	TSAT Compliance Alert	The ASAT has not been received by TSAT + 'TSAT Compliance Window' (-5/+5mins)
13a	Automatic TOBT and CTOT Conflict	Is an early warning alert highlighting the fact that the EIBT of the inbound flight currently linked to the outbound flight + MTTT + EXOT is in potential violation of the associated CTOT

Alert No.	Alert Name	Description/Alarm Rule
13b	CTOT Compliance	After AIBT of the inbound aircraft, generate an alert if ETOT/TTOT is outside of CTOT window (-5/+15mins compliance window)
13c	Regulation Cancelled Alert	CTOT restriction has been removed, alert automatically cleared after 5mins
14a	Flight Schedule Cancellation	A scheduled flight cancellation has been received via the AOC or APOC
14b	Flight Plan Cancellation	A flight plan cancellation has been received via the AIP System
14c	Flight Suspension Alert	An ATC flight plan (EOBT) has been suspended
14d	Flight De-Suspension Alert	An ATC flight plan (EOBT) has been de-suspended (re-activated)
16	Aircraft Off Blocks Late	Aircraft is late leaving the gate relative to the TSAT window (ASAT +5mins)
Dynamic rule	Parking Bay Conflict	Inbound flight Estimated In Block Time conflicts with Target Off Block Time of outbound aircraft
Dynamic rule	Go Around Alert	If an aircraft makes a go around

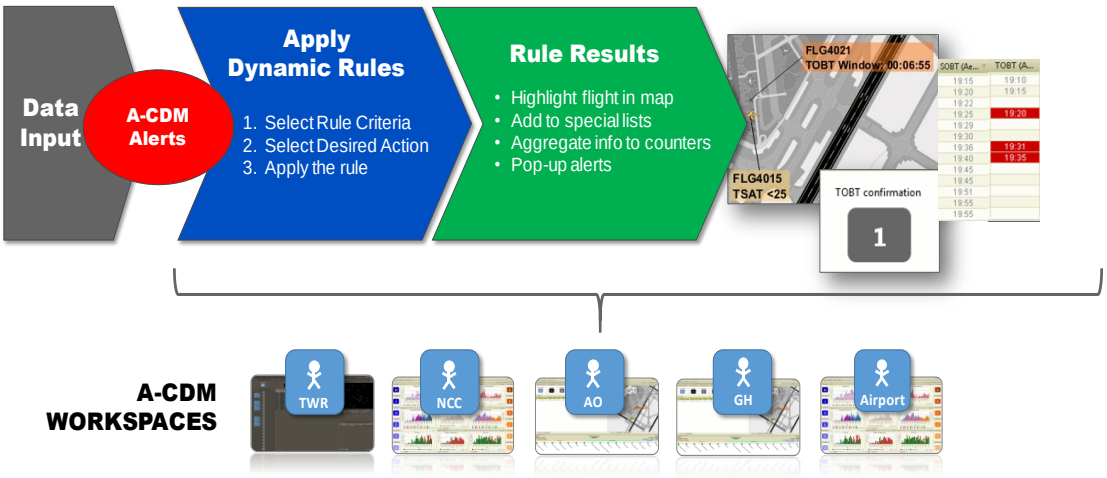


Figure 6 – Alerts and their application within the ACISP

In the following sections, each milestone table describes in detail: purpose, definition, how the milestone is triggered, timing, required data quality, how the ACISP records, automatically calculates and/or presents data, procedures for A-CDM stakeholders to follow and the operational status which will be updated in the ACISP.

Table 10 – Explanation of each milestone table

Milestone No	Milestone Name
Purpose	Operational purpose of the A-CDM milestone

Milestone No	Milestone Name
Definition	Definition of the A-CDM milestone
Trigger	Condition(s) under which A-CDM milestone is triggered
Origin and priority	How data for the A-CDM milestone is sourced
Timing	Information around timing of the A-CDM milestone or corresponding stage in the A-CDM process
Data quality	Accuracy requirements for capturing the A-CDM milestone
Action on A-CDM operation	Specific task executed by the A-CDM platform upon triggering this milestone
Procedures	Details the procedures to be followed
Operational status (changes)	Details the change to operational status

9.5 Start of the A-CDM Process: Pre-Tactical Planning – Milestone 1-2

The Flight Schedule for arriving and departing flights play a vital part in the Australian A-CDM implementation. As flight schedules are submitted to Airservices' Air Traffic Flow Management system (i.e. Harmony) these are also uploaded to the A-CDM Information Sharing Platform (ACISP). This will occur about 24 hours prior to the flight departing from the A-CDM airport and triggers the A-CDM process to start.

The ACISP will link the arrival and departure schedules for a flight which enables the initial A-CDM calculations of EIBT, TOBT, TSAT, TTOT. At this initial stage, calculations are based on Scheduled In Block Times (SIBT) and Scheduled Off Block Times (SOBT).

Milestone 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 schedule detail is transparent to the various A-CDM stakeholders to enable appropriate next-level planning (e.g. contingencies and other risks) including:

- Prepare the next day flight schedule
- Set arrival and departure rates
- Prepare the next day GDP (if applicable)
- Prepare next day parking bay/stand allocations
- Prepare towing plans if required.

Table 10 – Pre-Tactical Planning Phase Milestones

Phase of Flight	Milestone Number and Name	Comment
Pre-Tactical Planning	Milestone 1 – Schedule Received	Related to the DEPARTURE flight from the A-CDM Airport
Pre-Tactical Planning	Milestone 2 – Flight Plan Submission	Related to the DEPARURE flight from the A-CDM Airport

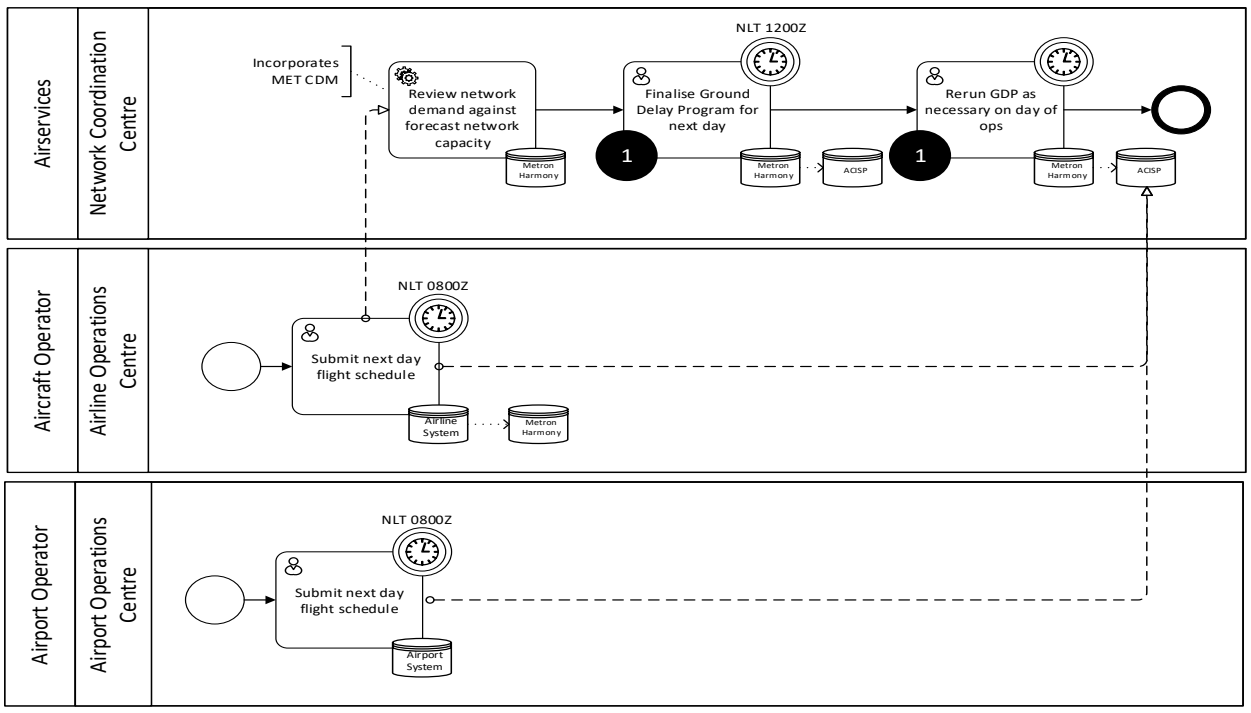
9.5.1 Ground Delay Program and CTOTs

If the ATFM system triggers a Ground Delay Program (GDP) and assigns a Calculated Take Off Time (CTOT) to a departing flight at an A-CDM airport, the TSAT will adjust to take into account and enable compliance with the CTOT.

9.5.2 Pre-Tactical Planning: Milestone 1 – Schedule Received

The daily schedule is uploaded into Metron Harmony, which provides the primary source of initial flight information. This is the trigger for the A-CDM process to commence for a flight.

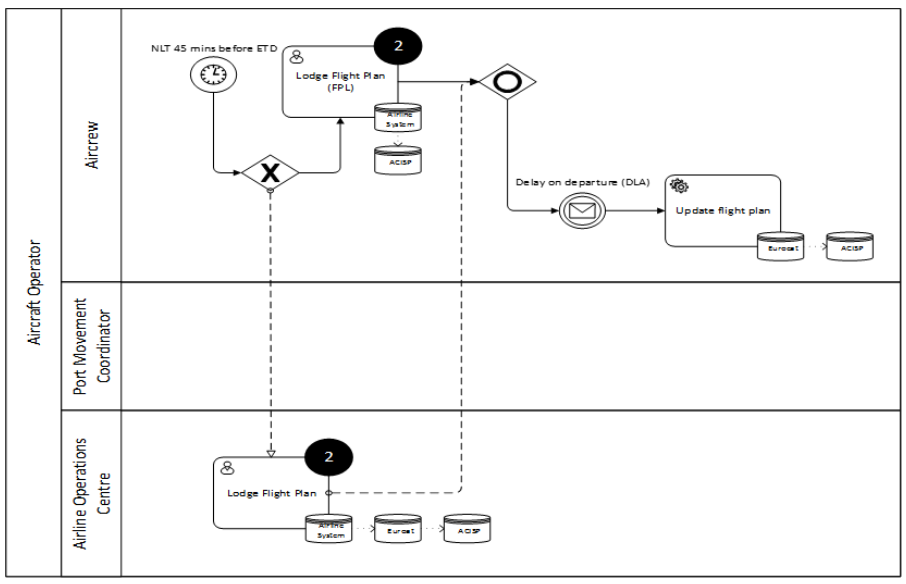
Table 11 – Milestone 1

MILESTONE 1	**Schedule received**
Purpose:	To start the A-CDM process for a flight AND to allow early awareness of departure delay if there are enroute/destination airport constraints
Definition	Schedule for flight is received including a Calculated Take Off Time (CTOT) (from the airport of origin) if a GDP is active
Trigger	Initial flight entity is received and updated every time an assigned CTOT issued for a flight change
Origin and priority	The following ATFM data elements for a flight will be sent to the ACISP through the Airservices Integration Platform (AIP System) from Metron Harmony: Upon (re) running the GDP a refresh will occur: • IOBT (SOBT) • HLDT (estimated landing time by Harmony) • CTOT (when GDP is active)
Timing	Schedules are uploaded into Metron Harmony in the late afternoon prior to the day of operations. Once the schedules are uploaded, the required GDPs are run the evening prior to the day of operations at agreed times. GDP's may subsequently be re-run in cases of changed conditions.
Data Quality	Data quality assured by Metron Harmony
Action on A-CDM Operation	The ACISP will receive flight schedules for the ARRIVAL and DEPARTURE flights about 24 hours prior the actual departure from the A-CDM airport. The ACISP will ***link the schedule information*** which enables the initial A-CDM calculations of EIBT, TOBT and TSAT to take place. **Record:** • ***Initial flight entity*** – upon receiving flight information from Metron Harmony, the ACISP shall determine if there is a scheduled flight that matches each inbound flight with a corresponding outbound flight at that airport. Correspondingly, an initial ELDT for an arrival flight and an initial TOBT for a departure flight will be set in the ACISP. • ***Flight cancellation*** – upon receiving a flight cancellation from Metron Harmony or from the AO, the ACISP shall cancel the flight. If an international flight cancellation is not received from Metron Harmony, the ACISP shall, upon receiving this cancellation from the Airport Operational Database (AODB), cancel the flight. **Calculate:** EIBT, TOBT, TSAT, TTOT **Present/Disseminate:** ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT, Parking Bay (available in Workspace dashboard -20hours prior to departure)
Procedures	 **AO** will: • submit next day flight schedule **NOMC** will: • Review network demand against forecast network capacity • Finalise the GDP (if required) – GDPs and associated CTOTs are assigned to flights 24 hours prior flight departures • Set the initial departure rates for each airport for the day of operations
Operational Status (changes to)	SCHEDULE RECEIVED

9.5.3 Pre-Tactical Planning: Milestone 2 – Flight Plan Submission

The flight plan submission ensures that the up to date flight information is received with the latest times. The Flight Plan (FPL) plays an important role as part of the A-CDM process and in particular the Estimated Off Block Time (EOBT) and its relationship to SOBT and TOBT.

Table 12 – Milestone 2

MILESTONE 2	Flight Plan Submission
Purpose	To check the data consistency between Airport Slot and AO's flight plan data (EOBT vs SOBT, aircraft registration and aircraft type).
Definition	Specified information provided to ATC, relative to an intended flight or portion of a flight of an aircraft. The FPL is filed with an ATS unit by the pilot or a designated representative. The departure time filed in the FPL is the Estimated Off Block Time (EOBT).
Trigger	This milestone is triggered by the submission of the FPL (earliest EOBT-3hr to -45mins), or updated submissions of the FPL, after cancellation or revised EOBT.
Origin and priority	The FPL is submitted by the AO via AFTN, NAIPS and distributed by AAMS to the ACISP and Metron Harmony. Flights exempt from A-CDM will be filtered and only available to air traffic control. These flights will be managed tactically.
Timing	Normally this takes place -3 hours up to -45mins before EOBT. In some cases, a RFPL will have been submitted, covering daily or weekly flights.
Data Quality	The FPL submitted by the AO is in accordance with ICAO Procedure for Air Navigation Services (PANS).
Action on A-CDM Operation	In order to ensure that a FPL information matches its schedule information, the following checks will be conducted automatically in the ACISP: • Check that the filed FPL (EOBT) correlates to airport slot (SOBT) • Check when no filed FPL appears to be available or when multiple ATC flight plans are filed for one and the same flight (with e.g. different routings, call signs or times) • Check if the data for the filed FPL (EOBT) matches SOBT data (e.g. aircraft type, destination, times). If no Flight Plan is received by 30mins from ETD (EOBT Carrier) the flight will be removed from the pre-departure sequence **Record:** FPL information **Calculate:** EIBT, TOBT, TSAT, TTOT **Present/Disseminate:** ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT, Parking Bay **Change flow status:** If a CTOT is cancelled for a flight this will be set to UNREGULATED
Procedures	
Operational Status (changes to)	INITIAL

9.6 Inbound: Milestone 3-6

During the Arrival Management of the flight, an ELDT at the runway threshold is predicted by either Eurocat at Milestone 3 or by MAESTRO at Milestones 4 and 5. MAESTRO assesses the actual airborne demand against capacity and assigns runway landing slots to all inbound traffic. The assignment of tactical arrival slots at Milestones 4 (initial assignment) and 5 (stable sequence) improves on the accuracy of the estimated time of arrival allowing increased confidence for decision making in the context of A-CDM.

These ELDTs, at milestones 3, 4 and 5, will be used to predict an accurate EIBT based on a VTT calculation as well as the TOBT, TSAT and TTOTs. A-CDM stakeholders can then better plan their operations based on this A-CDM data.

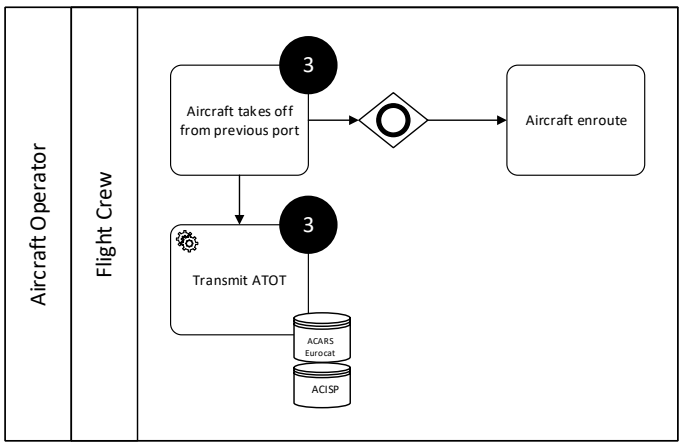
Table 13 - Inbound Phase Milestones

Phase of Flight	Milestone Number & Name	Comment
Inbound	Actual Take-off time (ATOT) from outstation	Related to the ARRIVAL flight to the A-CDM Airport
Inbound	MAESTRO Update (STAR allocation)	Related to the ARRIVAL flight to the A-CDM Airport
Inbound	Sequenced for Arrival	Related to the ARRIVAL flight to the A-CDM Airport
Inbound	Actual Landing Time (ALDT)	Related to the ARRIVAL flight to the A-CDM Airport

9.6.1 Inbound: Milestone 3 – Actual Take off Time (ATOT) from originating airport

The time when an aircraft takes off from the originating airport on its way to a destination A-CDM airport.

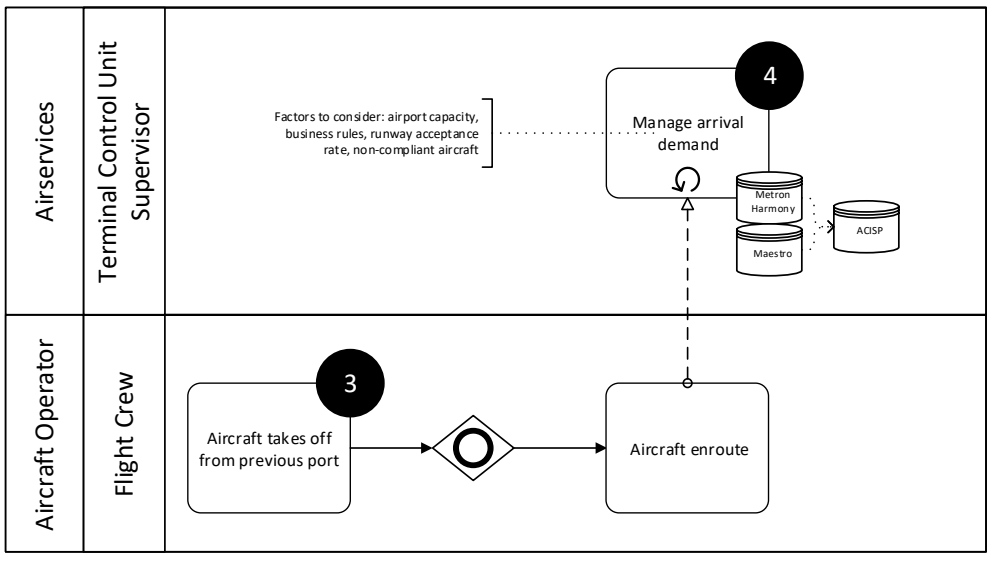
Table 14 – Milestone 3

MILESTONE 3	Actual Take Off Time (ATOT) from originating airport
Purpose	To allow early awareness of deviation from scheduled in-block time for resource planning and to provide an ELDT at an early stage by using the Flight Plan and the ATOT from the originating airport
Definition	Actual take-off time from the originating airport
Trigger	Aircraft take off (ATOT) from the originating airport
Origin and priority	For flights originating from a non-A-CDM airport, an Actual Departure Time (ADT) is automatically populated in the Eurocat system which can also be used by A-CDM as the ATOT. For flights originating from an A-CDM airport, the ATOT will be determined from (in order of highest priority): • Surveillance (i.e. wheels-up) • ACARS OFF message for ACARS equipped aircraft
Timing	The information is available after occurrence of the milestone
Data Quality	Data quality assured by original source system
Action on A-CDM Operation	**Record:** ATOT from the originating airport enables the calculation of a revised ELDT (Eurocat) and EIBT (ACISP utilising the ELDT) for the destination (arrival) A-CDM airport **Re-calculate:** EIBT, TOBT, TSAT, TTOT **Present/Disseminate:** ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT, Parking Bay
Procedures	
Operational Status (changes to)	AIRBORNE

9.6.2 Inbound: Milestone 4 – MAESTRO Update (STAR allocation)

During the pre-arrival phase of the flight, an ELDT at the runway threshold is predicted by MAESTRO at ~200 nautical miles from arrival when the STAR allocation occurs. This ELDT will be used to predict an accurate EIBT based on a VTT calculation. A-CDM stakeholders can then better plan their operations based on this more accurate EIBT.

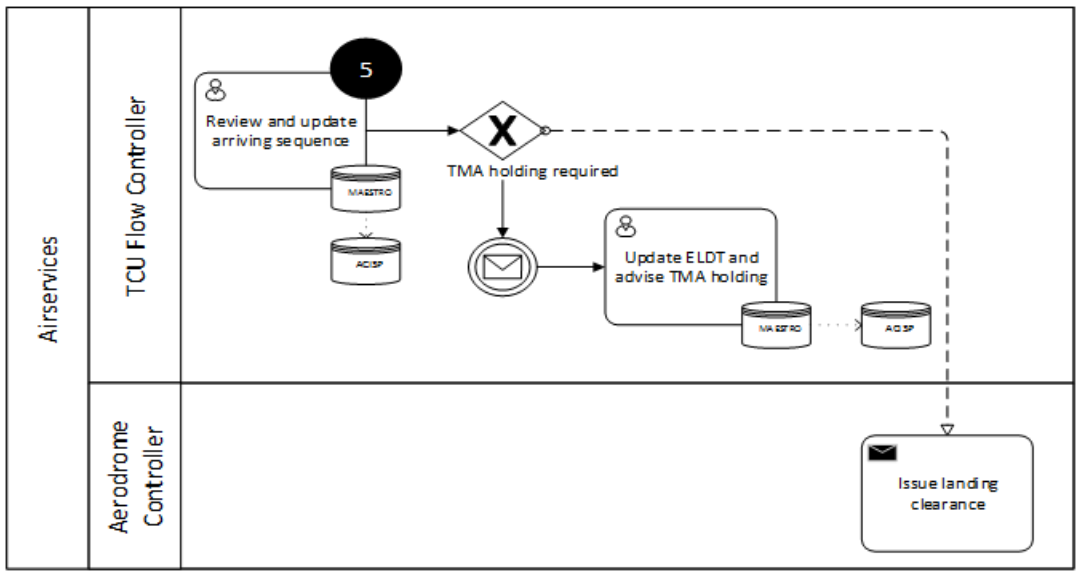
Table 15 – Milestone 4

MILESTONE 4	**MAESTRO Update**
Purpose	To allow early awareness of deviation from scheduled in-block time for resource planning To estimate ELDT and prompt alert if potential gate conflict is anticipated
Definition	MAESTRO assigned runway arrival slot (STA) and ELDT at the runway for the destination A-CDM airport
Trigger	STAR allocation (runway allocated)
Origin and priority	The ELDT information is available from the MAESTRO system and is now the most accurate prediction of the flight landing time at the runway threshold (change from the EUROCAT ETA)
Timing	A MAESTRO calculated ELDT is available during the pre-arrival phase of the flight through to landing at the runway threshold
Data Quality	Target accuracy for ELDT is -5+5mins (MAESTRO sequence is not yet stable at Milestone 4)
Action on A-CDM Operation	**Record:** ELDT updates **Re-calculate:** EIBT, TOBT, TSAT, TTOT (ELDT updates from MAESTRO enable the calculation of a more accurate EIBT at the destination A-CDM airport and hence a revised prediction of the TOBT for the subsequent departure, based on a MTTT (based on estimates or default values provided by AO's) for the outbound flight for that aircraft) **Present/Disseminate:** ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT, Parking Bay
Procedures	 **TCU** manage arrival demand
Operational Status (changes to)	ENROUTE (Note: This is enroute to arrival phase)

9.6.3 Inbound: Milestone 5 – Sequenced for Arrival

The flight enters the Final Approach phase, when the final arrival sequence is established, for the destination and the latest predicted landing time (ELDT) is available from MAESTRO. This will also trigger an update to the EIBT.

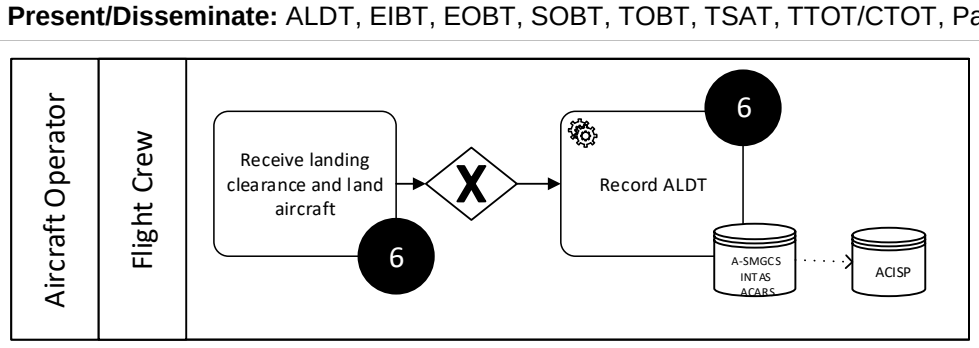
Table 16 – Milestone 5

MILESTONE 5	**Sequenced for Arrival**
Purpose	To allow for awareness of deviation from scheduled in-block time for resource planning To provide a highly accurate and stable ELDT as landing sequence is confirmed
Definition	Latest update to the MAESTRO calculated time for ELDT at the runway for the destination A-CDM airport
Trigger	Flight is stable and/or frozen in the MAESTRO arrival sequence (ELDT -25mins)
Origin and priority	The latest update to the ELDT information is available from the MAESTRO system and is the most accurate prediction of the landing time at the runway threshold
Timing	MAESTRO ELDT updates available until the flight has landed
Data Quality	Target accuracy for ELDT is +1/-1mins (may not be accurate if there is a go around)
Action on A-CDM Operation	**Record:** ELDT **Re-calculate:** EIBT, TOBT, TSAT, TTOT (ELDT updates from MAESTRO (provided as STA by MAESTRO) enable the calculation of a more accurate EIBT at the destination and hence a revised prediction of the turnaround TOBT (EIBT + MTTT) for the subsequent departure) **Present/Disseminate:** ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT, Parking Bay
Procedures	 **TCU** • review and update arriving sequence • reinsert the aircraft into the arrival sequence if a go around/missed approach occurs **Aerodrome Controller** • issues landing clearance Any significant changes to the EIBT will inform the tactical planning of ground handling operations and a change to TOBT
Operational Status (changes to)	SEQUENCED FOR ARRIVAL

9.6.4 Inbound: Milestone 6 – Actual Landing Time (ALDT)

This is the time that the aircraft touches down on a runway and is used to further refine the calculation of EIBT based on the Estimated Taxi in Time (EXIT).

Table 17 – Milestone 6

MILESTONE 6	Actual Landing Time (ALDT)
Purpose	To allow for awareness of deviation from scheduled in-block time for resource planning
Definition	Actual time that an aircraft touches down on a runway
Trigger	Aircraft touching down on the runway
Origin and priority	ALDT will be determined from: • Airport surveillance (i.e. wheels-on) • ACARS ON message for ACARS equipped aircraft
Timing	The information is available when the aircraft lands
Data Quality	Target accuracy for ALDT is +1/-1min
Action on A-CDM Operation	**Record:** ALDT **Re-calculate:** EIBT, TOBT, TSAT, TTOT (ALDT enables the calculation of a more accurate EIBT (ALDT + EXIT) and hence a revised prediction of the TOBT for the subsequent departure (EIBT + MTTT). The MTTT is based on estimates or default value provided by the AO's) **Present/Disseminate:** ALDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT, Parking Bay
Procedures	 **Flight Crew** • receive land clearance and land aircraft Any significant changes to the EIBT will inform the tactical planning of ground handling operations. The DGHA will be able to check if the aircraft flight details for the subsequent departure and the A-CDM predicted TOBT are consistent
Operational Status (changes to)	LANDED

9.7 Surface Management

The aim of **Surface Management** is to maximise the efficient use of AO/Ground Handling resources. The Surface Management tool provides situational awareness of the progress of taxiing aircraft (in and out) as well as visual display (real-time feed) of airfield ground movements (e.g. aircraft, tugs and other vehicles) in relation to airfield infrastructure to maximise efficiency use of AO/Ground Handling resources. It includes a view of:

- Aircraft parking bays
- Runways
- Movement areas
- Taxiways.

Real-time surveillance data of aerodrome ground movements (landing, taxiing, at the parking bay, take off etc.) is distributed to A-CDM stakeholders.

9.7.1 Turnaround Management: Milestone 7-14

The scope of Turnaround Management starts from when an aircraft arrives in blocks (AIBT) and ends when the aircraft is ready to go off blocks (AOBT). Critical for the success of turnaround management are AO/DGHA monitoring progress, tracking against the TOBT and ensuring any material change (-5/+5mins to the initial TOBT) is communicated.

Turnaround management will ensure good interaction amongst all stakeholders and an understanding of the importance of TOBT. Increasing ownership of procedures by AOs and/or their DGHAs will improve performance of the turnaround. The dynamically maintained TOBT becomes the critical piece of data for pre-departure sequencing, through the system generated TSAT. Start-up and pushback procedures following well established rules.

Table 18 – Turnaround phase milestones

Phase of Flight	Milestone Number & Name	Comment
Turnaround	7 – Actual In-Block Time (AIBT)	Related to the DEPARURE flight from the A-CDM Airport
Turnaround	9 – Target Off Block Time (TOBT)	Related to the DEPARURE flight from the A-CDM Airport
Turnaround	10 – Target Start-up Approval Time (TSAT)	Related to the DEPARURE flight from the A-CDM Airport
Turnaround	11 – Boarding Starts (ASBT) *(future state – not part of Stage 2)*	Related to the DEPARURE flight from the A-CDM Airport
Turnaround	12/13 – Actual Aircraft Ready Time (ARDT) & Actual Start-up Request Time (ASRT)	Related to the DEPARURE flight from the A-CDM Airport
Turnaround	14 – Actual Start-up Approval Time (ASAT)	Related to the DEPARURE flight from the A-CDM Airport

9.7.2 Towing (Future State): Tow Plan Process

Partners will provide tow plan information to the ACISP through the system interface between the ACISP and the partner native systems. The tow plan information may be kept up to date tactically by the Partner through the interface from the partner native systems. The ACISP will associate the following tow information with a flight:

- Actual Tow Start Time
- Actual Tow End Time
- Estimated Tow Start Time
- Estimated Tow End Time
- Scheduled Tow Start Time
- Scheduled Tow End Time
- Tow Start Location
- Tow End Location
- Associated aircraft registration or callsign

Partners and stakeholders will be able to view through the A-CDM Workspace:

- a list of all flights that have been towed
- a warning of when a tow operation will begin within a specified time period provided accurate tow estimates are sent to the ACISP
- an identification on the Aerobahn Display of aircraft that are being actively towed

As a regulatory requirement, all tugs must have serviceable transponders which need to be switched on when airside at aerodromes equipped with ground surveillance. The ACISP will use the tug transponder to evaluate the behaviour of the tug to automatically determine if a tow is occurring.

Scheduled/Estimated tow information can be used to assist in making a better and earlier determination of a tow. Hence, to ensure accurate on-bay occupancy data and to identify potential bay conflicts, partners should ensure that the tow schedule and estimates in native systems or A-CDM Workspace are kept up to date.

When a tow is determined to be occurring, the ACISP will associate the tow vehicle with the aircraft being towed and identify both on the ACISP Map Display (Aerobahn). In the event that a vehicle is identified as being in a probable towing state, and an aircraft is unable to be associated with it (e.g. it is being towed from a hanger with no surveillance coverage), the partner will need to manually associate the aircraft with the tow vehicle by right clicking on the vehicle in the ACISP and associating an aircraft with the tow vehicle manually.

To further ensure the accuracy of the detected tows, it is the responsibility of the partner to initiate manual actions via the A-CDM Workspace Tow Planner interface or add any tow events that might not appear in the Tow Planner.

As a last resort to correct a missed tow event, the partner may manually move a target in the ACISP from its tow start location to its tow end location. This manual manipulation of the target's location does not register a tow event, however it supports more accurate gate conflict detection.

Partner Responsibilities

Prior to a Tow event
• Keep the ACISP Tow Vehicle table up to date
• Send Tow Schedules to the ACISP via the Partner data interface
• Send Updated Tow Estimates to the ACISP via the Partner data interface.
During a Tow Event
• Observe tow events on the ACISP
  • If a tow event is observed that does not have an aircraft associated with it, manually associate the aircraft with the tow vehicle.
  • If a tow event is occurring and is not detected on the ACISP, manually start the tow.
  • If the tow cannot be manually started, on the ACISP move the aircraft from the current location to the tow destination location.

9.7.3 Push and Hold

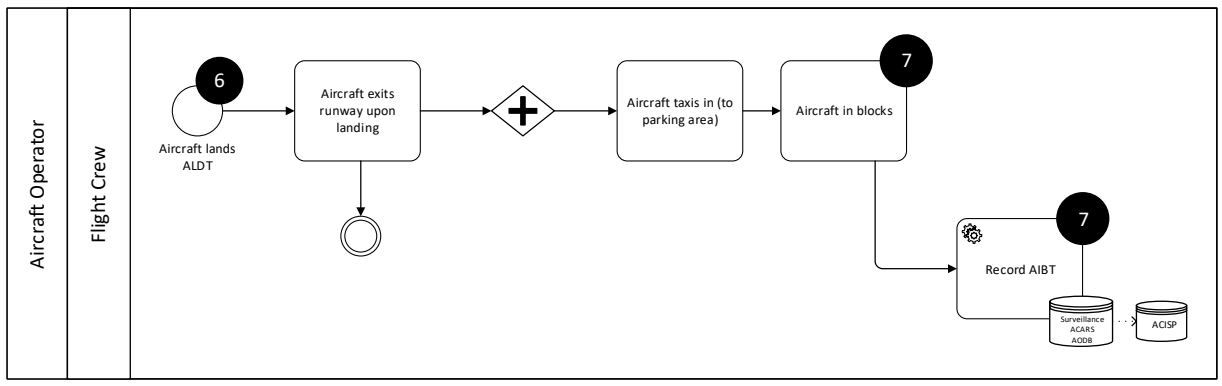
This process will be used to tow/pushback/taxi and park an aircraft while awaiting TSAT compliance if an aircraft is required to vacate a parking bay/stand.

- If TSAT is significantly different from the TOBT, AO or Airport Operator may elect to tow the aircraft off the bay/stand to allow access for a pending arrival into that bay/stand.
- The AO/Airport Operator will contact the Tower (directly or via the Flight Crew) and indicate which aircraft needs to be towed off the bay/stand and the location of the holding position.
- The AO/DGHA will change the aircraft TOBT to match the time they are required to vacate the gate.
- Flight Crew will call ATC when ready as per normal TOBT Compliance and ATC will record ARDT/ASRT (Milestones 12/13) and advise to flight crew to stand by (or contact) ground frequency.
- ATC will issue a tow clearance for the “push and hold” to the Tug Driver/Flight Crew when/if traffic permits.
- Once aircraft is at the hold position the ATC will initiate the start approval (and record Actual Start-up Approval (ASAT) (Milestone 14)) within TSAT compliance window (-5/+5mins).

9.7.4 Turnaround: Milestone 7 – Actual In Block Time (AIBT)

The time that the aircraft actually arrives at the parking bay and is in blocks.

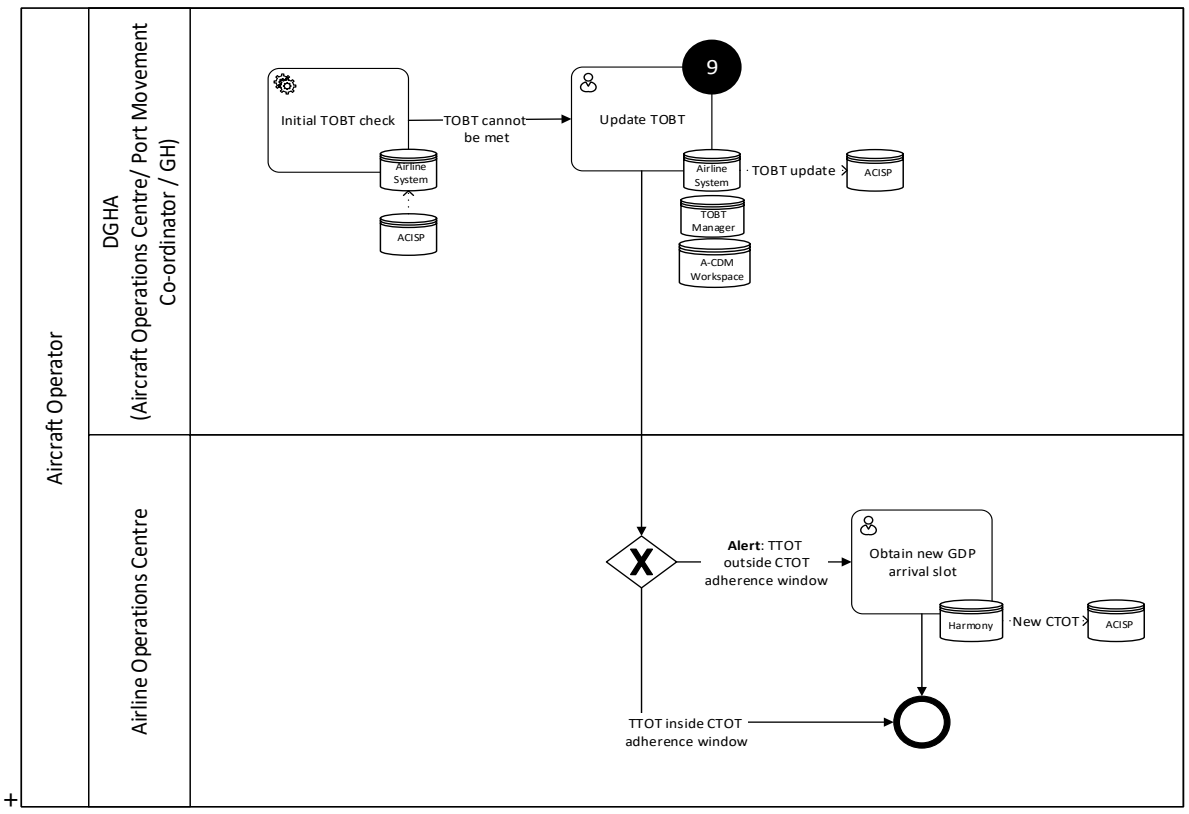
Table 19 – Milestone 7

MILESTONE 7	**Actual In-Block Time (AIBT)**
Purpose	To notify stakeholders that the aircraft is in blocks
Definition	Time that an aircraft arrives in blocks
Trigger	Aircraft arriving at the parking stand (in block)
Origin and priority	AIBT will be determined from: • Airport surveillance • ACARS IN message for ACARS equipped aircraft • Information received from the AODB
Timing	The information is directly available after occurrence of the milestone.
Data Quality	Target accuracy for AIBT is +1/-1min.
Action on A-CDM Operation	**Record:** AIBT **Re-calculate:** TOBT, TSAT, TTOT **Present/Disseminate:** ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT, Parking Bay
Procedures	 **Flight crew** • land and park the aircraft The AIBT will inform the commencement of ground handling operations **AO/DGHA** • check if the aircraft flight details for the subsequent departure and the A-CDM initial predicted TOBT are accurate and update if required.
Operational Status (changes to)	IN-BLOCK

9.7.5 Turnaround: Milestone 9 – Target Off Block Time (TOBT)

The TOBT is the time that aircraft operator and/or its ground handling agent estimate that an aircraft will be ready for departure – aircraft doors are closed, boarding bridge or stairs disconnected, pushback equipment in place and ready to start engines or pushback upon receiving an ATC clearance. The TOBT is automatically generated by the schedule and updated through EIBT and AIBT updates. Manual updates only occur when the automatically calculated TOBT does not meet operational requirements (updates by AO or DGHA depending on AO procedures). TOBT is the primary data to support multiple procedures in A-CDM. It is used to inform all parties on the real-time readiness of an aircraft. Inaccurate TOBT means inaccurate TSAT and TTOT and leads to inefficiencies in utilisation of runway capacity, as well as avoidable operator delays. The TOBT provides a common target time for all stakeholders to work towards to generate the TSAT and TTOT for departure management and predict departure demand to optimise runway utilisation.

Table 20 – Milestone 9

MILESTONE 9	Target Off Block Time (TOBT)
Purpose	AO/DGHA provide their most accurate TOBT taking into account the operational situation The aim of the final TOBT is to give a timely, accurate and reliable assessment of the off-block time An accurate TOBT is a pre-requisite to establish an optimised pushback/pre-departure sequence To check the feasibility of TOBT vs SOBT/EOBT
Definition (TOBT confirmation)	The time at which TOBT will be automatically confirmed (prior to that TOBTs are automatically calculated by the system from SOBT -20hours)
Trigger	The later of ALDT of the inbound flight, or ETD (EOBT Carrier) -30mins or EOBT -30mins if no ETD or SOBT -30mins if no ETD (EOBT Carrier) or EOBT
Origin and priority	For all flights the TOBT is initially set equal to SOBT. For any flights with a linked arrival the TOBT will be automatically updated by the ACISP based on arrival information as it is received. Other sources of information can also affect the TOBT to change, while still remaining in the “Automation Phase”. These are: • An ETD from a data feed (Aircraft Operator) into the ACISP. This will update the TOBT value equal to ETD • An EOBT from the Flight Plan. This will update the TOBT value equal to EOBT only if the ETD has not been changed prior to the Flight Plan submission. • The ELOBT (Carrier) updated via Metron Harmony will update the TOBT into the ACISP. **IMPORTANT:** The ETD has higher priority than EOBT so it will supersede any earlier TOBT set using EOBT. For flights that have a previous leg, the TOBT will be updated based on EIBT+MTTT (in case this exceeds SOBT/ETD of the outbound flight).
Timing	The TOBT is automatically confirmed in the ACISP at the later of: • ALDT of the inbound flight or • ETD -30mins or • EOBT -30mins if no ETD or • SOBT -30mins if no ETD or EOBT After this TOBTs can ONLY be manually updated by the AO/DGHA.
Data Quality	Target accuracy for TOBT is +5/-5mins
Action on A-CDM Operation	**Record:** TOBT updates **Re-calculate:** TSAT, TTOT **Present/Disseminate:** ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT
Procedures	AO is responsible for TOBT compliance. Irrespective of the TSAT, the aircraft must be ready for departure at TOBT -5/+5mins as the TSAT may be revised forward at short notice. Any time that the TOBT or TSAT cannot be met, or an earlier departure is required, the TOBT must be updated expeditiously.  **AO/DGHA** • actively monitors the progress tracking of the turnaround against the TOBT and ensure any material change (-5+5mins to the predicted TOBT) is updated • takes control of managing the TOBT at ALDT or EOBT (Flight Plan) -30mins The TOBT informs the Pre-Departure Sequencer for the generation of a TSAT based on a number of criteria.

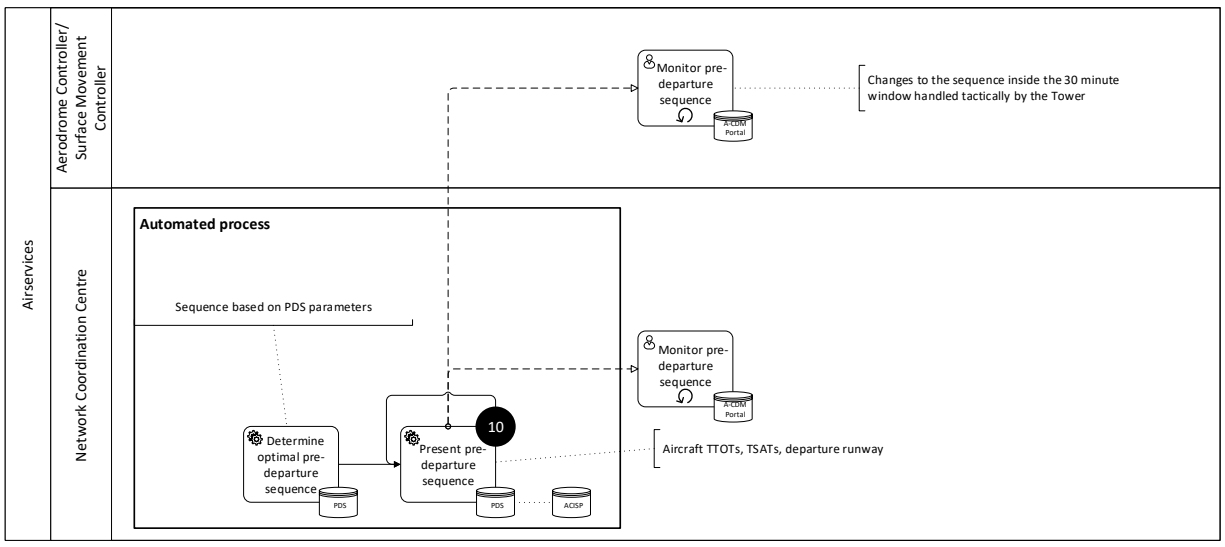
9.7.6 Turnaround: Milestone 10 – Target Start-up Approval Time (TSAT)

The TSAT is the time at which start-up/pushback approval can be expected from ATC. The TSAT is an essential part of pre-departure sequencing. The pre-departure sequencer will utilise the AO nominated TOBT as the reference to sequence departing flights. The pre-departure sequencer optimises the departure sequence based on a number of factors including runway capacity, departure queue length, departure rate, taxiway congestion, wake turbulence category, GDP, CTOT and parking bay position.

The PDS calculates the TSAT and the TTOT after taking multiple constraints and preferences into account. The PDS bases its TSAT calculation in accordance with the following parameters:

- Region closures
- Runway configuration (current and planned)
- Departure rate (current and planned)
- Wake turbulence separation standards
- Fix balancing and separation
- Carrier Equity
- Delay Equity
- Carrier Priority
- Variable Taxi Time
- Queue Length
- Airspace Flow Restrictions
- Calculated Take Off Time (CTOT)
- Target Off Block Times
- Destination/CTOT Equity
- Arrival Aircraft

Table 21 – Milestone 10

MILESTONE 10	Target Start-up Approval Time (TSAT)
Purpose	To create a stable pre-departure sequence To allow decision making based TOBT and TSAT values
Definition (TSAT stable)	Time at which TSAT becomes stable (TSATs are automatically calculated by the system from SOBT -20 hours. At TSAT -30mins, TSAT will be become stable)
Trigger	TSAT -30mins
Origin and priority	Generated by the A-CDM PDS
Timing	The information will be available from flight creation and updated based on the TOBT
Data Quality	Data quality assured by Saab system (pre-departure sequencer PDS)
Action on A-CDM Operation	**Record:** TSAT **Re-calculate:** TTOT **Present/Disseminate:** ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT/CTOT
Procedures	 The TOBT can be updated after the TSAT has been issued, however only up until the TSAT time. If, for an ATFM regulated flight, a TOBT update results in new TTOT being calculated that is outside the CTOT adherence window, the AO will be required to obtain a new GDP arrival slot in Metron Harmony. This will trigger the calculation of a new CTOT to be sent to the ACISP for the PDS to calculate a revised TSAT for the flight. **ATC** will: • Update the departure queue length based on demand and capacity requirements for the airport • Configure pavement/taxiway/runway closures or restrictions • Update desired departure rates for each runway • Update runway configurations
Operational Status (changes to)	SEQUENCED FOR DEPARTURE (when TSAT is stable at TSAT -30mins)

9.7.7 Turnaround: Milestone 11 – Boarding Starts (Future State)

This milestone provides information that the first passenger has commenced boarding as expected to meet the TOBT.

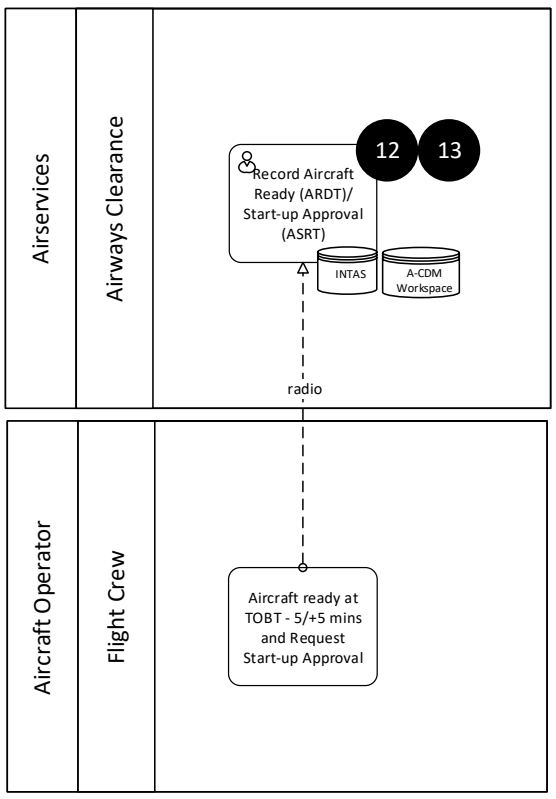
Table 22 – Milestone 11

MILESTONE 11	Boarding Starts (ASBT)
Purpose	To notify stakeholders that boarding has commenced
Definition	The bay/stand is open for passengers to physically start boarding (independent of whether boarding takes place via an air-bridge/pier, aircraft steps or coaching to a stand). This is not to be confused with the time passengers are pre-called to the bay/stand via flight information display systems (FIDS) or public address systems.
Trigger	Actual start for boarding of passengers
Origin and priority	Airport Operational Data Base system (AODB)
Timing	The information is available after occurrence of the milestone
Data Quality	Target accuracy is +1/-1min
Action on A-CDM Operation	**Present/Disseminate:** ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, ASBT, TTOT/CTOT
Procedures	Airports are responsible for providing this information to inform stakeholders that boarding has started.
Operational Status (changes to)	BOARDING

9.7.8 Turnaround: Milestone 12 – Aircraft Ready (ARDT) and Milestone 13 – Start up Request (ASRT)

Milestones 12 and 13 are combined for the A-CDM implementation in Australia. This is in order to simplify and streamline the start-up and pushback procedures for both Flight Crew and ATC. These milestones play an important part in the start-up and pushback phase and will help ensure that the A-CDM procedures established related to TOBT and its -5/+5mins compliance window are followed.

Table 23 – Milestone 12 & Milestone 13

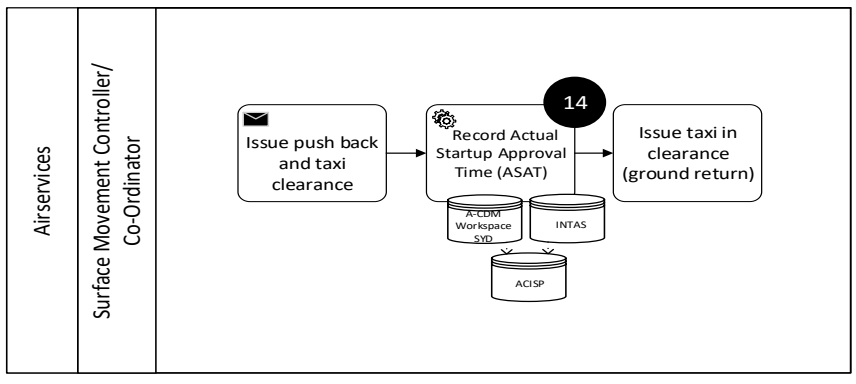
MILESTONE 12 AND MILESTONE 13	Aircraft Ready and Start Up Request
Purpose	To notify stakeholders that the aircraft is ready and start-up/pushback has been requested To automate removal of TOBT and TSAT if rules are not followed based on local procedures To support analysis to measure aircraft readiness against the TOBT and TSAT
Definition	ARDT – Time when the aircraft is ready for pushback or start immediately after clearance delivery ASRT – Time the Flight Crew request start-up/pushback clearance
Trigger	ATC captures the aircraft ready call
Origin and priority	Tower INTAS system (BNE, MEL, PER) / A-CDM Workspace (SYD)
Timing	The information is available after occurrence of the milestone
Data Quality	Target data accuracy is +1/-1min
Action on A-CDM Operation)	**Record:** ARDT/ASRT **Present/Disseminate:** ALDT, AIBT, EOBT, SOBT, TOBT, ARDT/ASRT, ASAT, TSAT, TTOT/CTOT
Procedures	

MILESTONE 12 AND MILESTONE 13	Aircraft Ready and Start Up Request
Procedures (cont.)	<u>Flight Crew calls ready early outside of the TOBT window (> -5mins)</u> • **Flight Crew** calls ready (ARDT) with ACD/COORD and the ARDT and ASRT is captured • **ACD/COORD** informs the Flight Crew they are non-compliant and to stand by • Early call is reported on as part of post-operational performance reporting <u>Flight Crew calls ready inside the TOBT window (-5/+5mins)</u> • **Flight crew** calls ready with ACD/COORD and the ARDT and ASRT are captured • **ACD/COORD** assesses Milestone 14 • **ATC** advises TSAT when >5mins of TOBT (i.e. when start-up approval will not be given immediately) <u>Flight crew calls ready late outside of the TOBT window (> +5mins)</u> **Flight Crew** calls ready (ARDT) with ACD/COORD **ACD/COORD** advises Flight Crew to contact their AO to obtain a new TOBT <u>What happens to TOBT if no ready call within TOBT compliance window?</u> TOBT and TSAT will be removed if pilot does not call for when ready for start / pushback clearance before the end of the TOBT window (i.e. TOBT +5mins). A new TOBT is required to generate a new TSAT. A late ASAT (i.e. >TSAT +5mins) will not result in a loss of TSAT or TOBT
Operational Status (changes to)	READY

9.7.9 Turnaround: Milestone 14 – Actual Start-up Approval Time (ASAT)

The ASAT is the time at which start-up/pushback approval is given by ATC. Milestone 14 plays an important part in the start-up and pushback phase and will help to ensure that the A-CDM procedures for TSAT and its -5/+5mins window are followed.

Table 24 - Milestone 14

MILESTONE 14	Actual Start-up Approval Time (ASAT)
Purpose	To measure ATC's adherence to TSAT
Definition	ASAT is the time at which start-up/pushback approval is given by ATC
Trigger	ATC captures ASAT
Origin and priority	Tower INTAS system (BNE, MEL, PER) A-CDM Workspace (SYD)
Timing	The information is directly available after occurrence of the milestone
Data Quality	Target data accuracy is +1/-1min
Action on A-CDM Operation	**Record:** ASAT **Present/Disseminate:** ALDT, AIBT, EOBT, SOBT, TOBT, ARDT/ASRT, TSAT, ASAT, TTOT/CTOT
Procedures	 **ACD/COORD** • monitors the TSAT window (-5/+5mins) • advises the **Flight Crew** to stand by for SMC within the TSAT compliance window • if not < -5mins from TSAT, ACD/COORD instructs Flight Crew to remain on frequency • once within -5 mins of TSAT, ACD/COORD instructs Flight Crew to standby by for SMC **SMC** • issues start-up/pushback and the time is captured. Engine starts, either on the bay or for a cross-bleed start, will be captured as the ASAT (and must still be no earlier than -5 mins of TSAT) In Sydney, Flight Crew who are on the Dom 1a apron will request start clearances from COORD.
Operational Status (changes to)	CLEARED FOR START-UP/PUSHBACK

9.8 Departure management: Milestone 15-16

Departure management focuses on the punctual departure of flights from the blocks to take off.

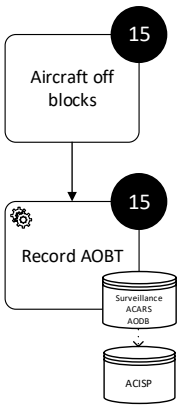
Table 25 – Outbound milestones

Phase of Flight	Milestone Number & Name	Comment
Outbound	Actual Off Block Time (AOBT)	Related to the DEPARURE flight from the A-CDM Airport
Outbound	Actual Take-Off Time (ATOT)	Related to the DEPARURE flight from the A-CDM Airport

ii. Outbound: Milestone 15 – Actual Off Block Time (AOBT)

Time at which the aircraft is off blocks.

Table 26 – Milestone 15

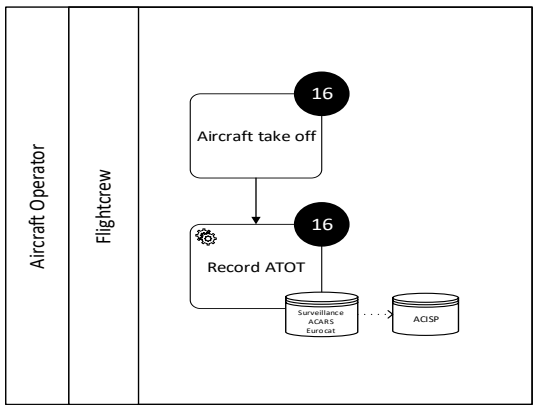
MILESTONE 15	Actual Off-Block Time (AOBT)
Purpose	Support post analysis to check if the aircraft has gone off blocks as per TSAT
Definition	Time the aircraft pushes back and is off blocks on its way to vacating the parking bay
Trigger	Aircraft commences pushback and is detected to have gone off-blocks on its way to vacating the parking bay
Origin and priority	AOBT will be determined from (in order of highest priority): • Airport surveillance • ACARS OUT message for ACARS equipped aircraft • Information received from the AODB
Timing	The information is directly available after occurrence of the milestone
Data Quality	Target accuracy for AOBT is +1/-1min
Action on A-CDM Operation	**Record:** AOBT recorded **Present/Disseminate:** AOBT
Procedures	 When a ground return/rejected take off occurs: • Whoever manages the stand/bay allocation to update this information in their native system to flow through to the ACISP **AO/DGHA** • clears A-CDM milestones via the A-CDM workspace • updates the TOBT to get the flight re-sequenced CTOT remains but alert is triggered if CTOT cannot be met
Operational Status (changes to)	OFF-BLOCK

9.8.1 Outbound: Milestone 16 – Actual Take Off Time (ATOT)

Time at which the aircraft takes off.

Table 27 – Milestone 16

MILESTONE 16	Actual Take Off Time (ATOT)
Purpose	To finish the A-CDM process and update relevant stakeholders with the take off information
Definition	Time that an aircraft takes off from the runway
Trigger	Aircraft has been detected as taken-off (wheels off) from the runway
Origin and priority	ATOT will be determined from: • Airport surveillance (wheels up) • ACARS OFF message for ACARS equipped aircraft
Timing	The information is directly available after occurrence of the milestone
Data Quality	Target accuracy for ATOT +1/-1min
Action on A-CDM Operation	**Record:** ATOT **Present/Disseminate:** ATOT

MILESTONE 16	Actual Take Off Time (ATOT)
Procedures	 Take off and return to Airport: **ATC** • updates the flight plan for the arrival in Maestro Whoever manages the stand/bay allocation would update this information in their native system to flow through to the ACISP **AO/DGHA** • clears the A-CDM milestones via the A-CDM workspace • then updates the TOBT to get the flight re-sequenced
Operational Status (changes to)	DEPARTED

10 Data Quality Compliance/Adherence

The guiding principle of data quality, timing and compliance/adherence is to be followed by all A-CDM stakeholders so that the system achieves its stated goals.

The effectiveness of data quality, timing and compliance/adherence in achieving these goals will be assessed through operational performance reporting and management. The data quality, timing and compliance/adherence requirements and procedures included in each of the Milestones define who should provide information, requirement for a milestone, when it should be provided, and the accuracy of the data. In practice, this means that when a user complies, they derive benefit from the system. When a user does not comply, they will not derive a benefit.

11 System/Technical Issues

The A-CDM Service will be managed by the Vendor who is responsible for managing and responding to any system issues and the following outlines how to report any system/technical issues.

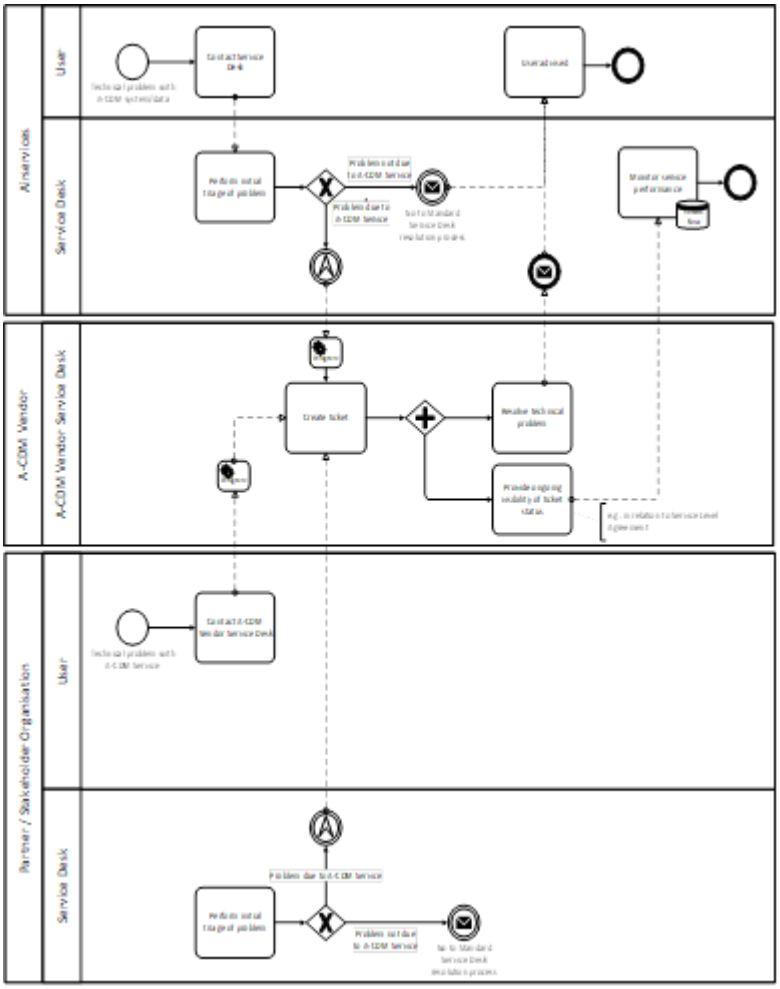


Figure 7 – System/Technology Resolution Procedure

12 Business Continuity Procedures

The objective of **Business Continuity Procedures** (BCP) is to ensure a timely resumption and delivery of essential business services in the event of a major disruption by maintaining the A-CDM Service. The objective of the BCP is to mitigate ATM operational risks should this occur.

The business interruptions that are of concern are outages. A-CDM degraded mode of operation will exist at an airport during any of the following service outage events:

- planned outage of the A-CDM service at an airport (e.g. planned maintenance)
- unplanned outage of the A-CDM service at an airport (e.g. A-CDM platform failure)
- partial failure of A-CDM service to users (e.g. no reporting function, or no PDS, or no SMAN) and hence limited functionality
- planned outage of a data source (e.g. A-CDM stakeholder integration platform maintenance)
- unplanned outage of a data source (e.g. A-CDM stakeholder integration platform issue, or comms link failure)

To manage these service outages and failure events and ensure that airport operations can continue, the following activities will occur:

- Contingency plans are in place which allow for airport operations to continue without access to the A-CDM service
- Continuity plans are established which describe the procedures to be followed for various A-CDM limited functionality scenarios.

Once it has been determined that a continuity or contingency mode will exist, users will be notified by an A-CDM system broadcast to follow the appropriate procedures.

A-CDM is about collaboration and clear communication will remain throughout any interruption to the A-CDM Service.

Refer to Appendix A for A-CDM Contingency Procedures.

13 Definitions

Within this document, the following definitions apply:

Table 28 – Definitions

Term/Acronym	Definition	Explanation
AAMS	Australian Aeronautical Messaging System	Airservices system used to receive and transmit ICAO aeronautical messages
ACA	Airport Coordination Australia	Slot management agents
ACARS	Aircraft Communications Addressing and Reporting System	Digital datalink system for transmission of short messages between aircraft and ground stations via air band radio or satellite
ACD	Airways Clearance Delivery	
A-CDM	Airport Collaborative Decision Making	A set of processes which allows aerodromes, aircraft operators, air traffic controllers, ground handling agents, pilots and air traffic flow managers to exchange operational information and work together to efficiently manage operations at aerodromes
A-CDM Airport	Brisbane, Sydney, Melbourne and Perth Airports	An airport is considered an A-CDM Airport when Information Sharing, Milestone Approach, Variable Taxi Time (VTT), Pre-Departure Sequencing, Adverse Conditions and Collaborative Management of Flight Updates elements are successfully implemented at an airport
ACGT	Actual Commencement of Ground Handling Start Time	The time when ground handling on an aircraft starts
ACISP	Airport CDM Information Sharing Platform	A generic term used to describe the means at a CDM airport of providing information sharing between A-CDM users
ADT	Actual Departure Time	
AIBT	Actual In Block Time	The time an aircraft arrives in blocks
AIP System	Airservices Integration Platform	
AIP Publication	Aeronautical Information Publication	A publication issued by or with the authority of a state and containing aeronautical information of a lasting character essential to air navigation
ALDT	Actual Landing Time	The actual time that an aircraft touches down on a runway

Term/Acronym	Definition	Explanation
AMAN	Arrival Manager	A tactical planning and sequencing tool designed to assist ATC to optimise the flow of arriving aircraft onto available runways
ANSP	Air Navigation Service Provider	An organisation responsible for management of flight traffic on behalf of a company, region or country
AO	Aircraft Operator	A person, organisation or enterprise engaged in or offering to engage in an aircraft operation
AOBT	Actual Off Block Time	The time the aircraft pushes back and is off blocks on its way to vacating the parking bay
AODB	Airport Operational Database	The airport system that sends and receives A-CDM milestone data
ARDT	Actual Ready Time	The time when the aircraft is ready for start-up/pushback immediately after clearance delivery, meeting the requirements set by the TOBT definition
ASAT	Actual Start-up Approval Time	Flight crew receive the approval from the Tower ATC for start-up/pushback
ASBT	Actual Start Boarding Time	The gate (bay/stand) is open for passengers to physically start boarding (independent of whether boarding takes place via an air-bridge/pier, aircraft steps or coaching to a stand). This is not to be confused with the time passengers are pre-called to the gate (bay/stand) via flight information display systems (FIDS) or public address systems.
A-SMGCS	The Advanced Surface Movement Guidance and Control System	System at airports having a surveillance infrastructure consisting of a Non-Cooperative Surveillance and Cooperative Surveillance
ASRT	Actual Start-up Request Time	Time the Flight Crew requests start-up/pushback clearance
ATC	Air Traffic Control	Service provided by ground-based controllers who direct aircraft on the ground and in the air. This is to separate, organise and expedite the flow of air traffic
ATM	Air Traffic Management	Management of the demand for, and the use of airspace

Term/Acronym	Definition	Explanation
ATFM	Air Traffic Flow Management	A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that air traffic control capacity is utilised to the maximum extent possible, and that the traffic volume is compatible with the capacities declared by the appropriate Air Traffic Services authority
ATMD	Air Traffic Management Director	
ATOT	Actual Take Off Time	The time that an aircraft takes off from the runway (wheels off)
ATS	Air Traffic Services	The service provided by Air Traffic Controllers working at airports for the arrival and departure flight phases and in Air Traffic Control Centres for the enroute flight phase
ATTT	Actual Turnaround Time	Metric AOBT - AIBT
AXIT	Actual Taxi In Time	Period between the ALDT ad AIBT
AXOT	Actual Taxi Out Time	Period between AOBT and ATOT
CHG	Flight Plan change message	Standard message sent to Network Operations to change a flight plan
COBT	Calculated Off Blocks Time	Time calculated and issued by an ATFM unit, as a result of pre-tactical slot allocation, at which a flight is expected to push back/vacate its parking position so as to meet a CTOT, taking into account start and taxi time
COORD	Coordinator	
CNL	Flight Plan Cancellation Message	Standard message sent to Network Operations to cancel a flight plan
CTOT	Calculated Take Off Time	Time calculated and issued by an ATFM unit, as a result of pre-tactical slot allocation, at which a flight is expected to become airborne
DGHA	Designated Ground Handling Agent	A person or organisation who provides data for turnaround milestones. This may include personnel from an Aircraft Operator or a Ground Handling Organisation
DLA	Flight Plan Delayed Message	Standard message sent to Network Operations to delay flight plan OBT
EIBT	Estimated In Block Time	Estimated time that an aircraft will arrive in blocks
ELDT	Estimated Landing Time	Estimated time that an aircraft will touch down on the runway (wheels on)

Term/Acronym	Definition	Explanation
ELOBT	Earliest Off Blocks Time	The earliest estimated time that an aircraft could be off blocks
EOBT	Estimated Off Block Time	The estimated time at which the aircraft will start movement associated with departure; also associated with the time filed by the aircraft operator in the flight plan
ETA	Estimated Time of Arrival	
ETD (EOBT Carrier)	Estimated Time of Departure (ATC)	Aircraft operator estimated time when an aircraft vacates its parking bay to begin taxi
ETOT	Estimated Take Off Time	Aircraft operator estimated take off time (wheels off)
EXIT	Estimated Taxi In Time	The estimated taxi time between ELDT and EIBT
EXOT	Estimated Taxi Out Time	The estimated taxi time between EOBT and ETOT
FDE	Flight Data Entry	INTAS electronic strip
FPL	Filed Flight Plan	ICAO derived flight plan
GDP	Ground Delay Program	Ground Delay Program applicable to flights arriving into the specified airport. A system of delaying aircraft departing from an airport to meet enroute or arrival slot times
HLDT	Harmony Landing Time	
ICAO	International Civil Aviation Organisation	United Nations Specialised Agency - It codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth
IFR	Instrument Flight Rules	
INTAS	Integrated Tower Automation Suite	An Airservices system that provides tower air traffic controllers with electronic flight and operational information to enhance airport efficiency
MAESTRO		ATC Tactical arrival management system
MET CDM	Meteorological Collaborative Decision Making	Process of considering aviation-related weather criteria contained in weather forecasts to assess the potential impact on the arrival rates used in ATFMATC Tactical arrival management system
Milestone	Part of the A-CDM Milestone Approach	A significant event that occurs during the planning or operation of a flight

Term/Acronym	Definition	Explanation
Min/mins	Minute or minutes	
MTTT	Minimum Turnaround Time	The minimum turnaround time agreed with an AO/GH for a specified flight or aircraft type
NAIPS	National Aeronautical Information Processing System	An Airservices system that is used for the input and dissemination of aeronautical information i.e. Flight Plans
NOMC	National Operations Management Centre	The National Operations Management Centre (NOMC) provides Air Traffic Management and Collaborative Decision Making services to domestic and international aviation stakeholders.
PDS	Pre-Departure Sequencer	A planning and sequencing tool designed to assist ATC to optimise the flow of departing aircraft onto the active departure runway. PDS assists in reducing departure delays at the holding points by reconciling start-up times with departure times
PSAT	Preliminary Start Approval Time	An advisory value for planning purposes prior to having a TSAT issued
RFPL	Repetitive Flight Plan	A repetitive flight plan is a flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units
SIBT	Schedule In Block Time	The scheduled time that an aircraft would be in flocks – based on Flight Plan submission
SLOT	Airport Movement Slot	A slot is a permission to operate an aircraft movement at a scheduled time of arrival or departure on a specific date and time at an airport
SMAN	Surface Manager	System which supports ATC operators in managing surface movements and assists in avoiding bottlenecks on taxiways, i.e. tarmac delays, bay/stand holds, taxi queues and turn times
SMC	Surface Movement Controller	
SOBT	Scheduled Off Blocks Time	The time that an aircraft is scheduled to depart from its parking position
STA	Scheduled Time Of Arrival	

Term/Acronym	Definition	Explanation
Target Time	The Target Time of a milestone	Relates to the time of an airport milestone and serves as a “contract” between A-CDM stakeholders who are committed to achieving the milestone at this time and is used for milestone monitoring
TMA	Terminal Manoeuvring Area	A designated area of controlled airspace surrounding a major airport where there is a high volume of traffic.
TMAN	Turnaround Manager	Airport management tool which supports and manages activities within the turnaround stage to prepare inbound aircraft for its following outbound flight. Activities include passenger disembarking, catering, cleaning, refuelling, ground handling and passenger boarding
TOBT	Target Off Block Time	Time that aircraft operator and/or its ground handling agent estimate that an aircraft will be ready for departure – aircraft doors are closed, boarding bridge or stairs disconnected, pushback equipment in place and ready to start engines or pushback upon receiving an ATC clearance
Towing Plan	Plan created by Aircraft operator or Airports to indicate their towing requirements for the day	Moving of an aircraft, other than aircraft pushback, by use of specialised ground support equipment
TSAT	Target Start-up Approval	Time at which the flight crew can expect engine start or pushback approval from ATC.
SM	Shift Manager	
TSM	Tower Shift Manager	
TTOT	Target Take Off Time	The target time that an aircraft can expect to take off
UTC	Coordinated Universal Time	Primary time standard by which clocks and times are regulated
VFR	Visual Flight Rules	
VTT	Variable Taxi Time	The estimated time that an aircraft spends taxiing between its parking stand and the runway and vice versa and is used for the calculation of TTOT and/or TSAT

14 References

Table 29 – References

Title
Source hyperlink: Eurocontrol CDM Implementation Manual, 2017
Source hyperlink: *airport-cdm-manual-2017.PDF* (local copy): Section 3.3 Milestone Approach – Eurocontrol, 2017 Pages 57-76
A-CDM Operating Model, v 3.0 December 2018

Appendix A A-CDM Contingency Procedures

A.1 A-CDM System Failures / Unusual Behaviour

A.1.1 Managing system issues

In the event of a system failure, A-CDM users should contact their local Service Desk and commence troubleshooting. Partner and other user Service Desks will follow their standard incident management process. Incidents within the platform will be treated with the appropriate classification and prioritisation based on severity. All high priority incidents will be escalated to Saab.

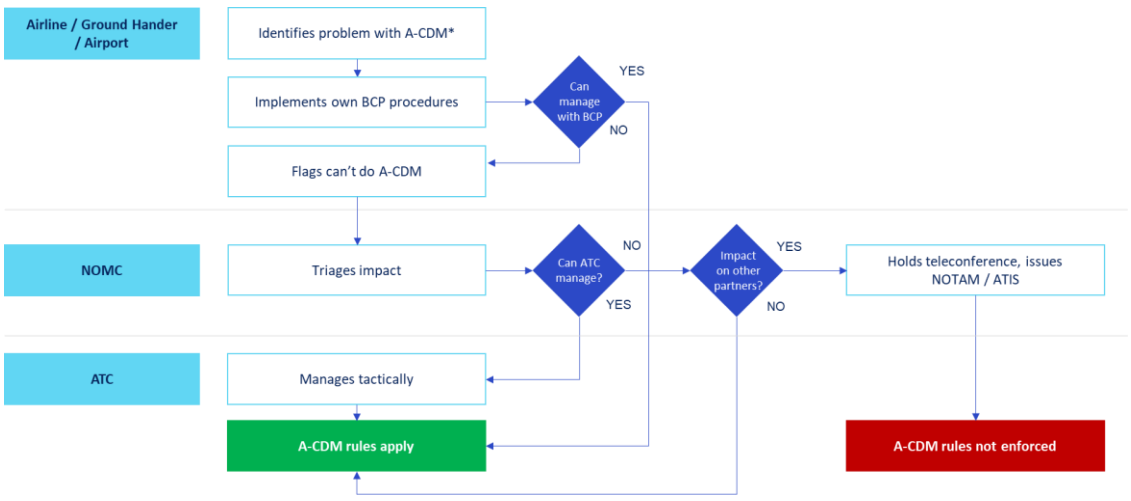
A.1.2 Managing unusual or unexpected system behaviour

In the event of an unusual or unexpected system behaviour which causes significant disruption to operations, A-CDM users should contact the NOMC who will triage the issue with the A-CDM Service Adviser in the first instance to understand behaviour and determine whether it is normal system behaviour or a defect. If not able to be explained, partner to raise incident with vendor in Jira. At the same time, an assessment will be made as to the impact on operations and potential suspension of A-CDM rules enforcement.

A.1.3 Impact on A-CDM procedures in the event of a system failure / unusual behaviour

PROCESS FLOW

The following diagram outlines the process to be followed in the case of a system failure:



*Refer **Table 29** for types of events/scenarios which might occur and the impact on A-CDM rules continuing to be enforced or not.

Table 30 – Typical Events / Scenarios

	AIRLINES / GROUND HANDLERS	AIRPORTS	ATC
System failure scenario or event	• An airline or ground handler is unable to update TOBTs • An airline or ground handler has no visibility of TSATs	• Airport is unable to send gate information to the A-CDM system • Airport needs to make manual updates and is unable to manage the workload • Airport is unable to identify potential gate conflicts	• ATC is unable to monitor TOBT/TSAT compliance • ATC is unable to configure the Pre-Departure Sequencer (flow restrictions, airport configurations, region status)
Unusual or unexpected system behaviour	• Various – generally related to when ATFM measures are in place		N/A
Impact on enforcement of A-CDM rules	NOT automatic suspension of A-CDM rules enforcement – depends on: • No. of flights impacted (e.g. size of the carrier) • Extent of impact on the airport (timing, traffic, etc) • Extent of impact on other partners • Ability to be managed tactically by ATC	NOT automatic suspension of A-CDM rules enforcement – depends on: • Workaround options available, e.g. gate data can be provided to ATC via other means (as per existing process) • Extent of manual workload required	SUSPEND A-CDM rules enforcement

<u>In the event of system failure</u>

1. Partner / operator advise NOMC that they are unable to comply with A-CDM procedures. This can be due to a number of scenarios:
   a) System failure
   b) Unusual or unexpected system behaviour
2. NOMC in conjunction with the ATMD triage the impact to the A-CDM process based on a number of factors including:
   a) Number of flights impacted (e.g. size of the carrier)
   b) Extent of impact on the airport/s in terms of timing, traffic, etc
3. NOMC engage ATC to determine if impacted flights can be tactically managed and, if accepted, advises the operator to make best efforts to continue operating in accordance with GDP COBT/CTOT only.

4. If ATC are unable to process tactically or there is significant impact on other partners, the NOMC will initiate an A-CDM teleconference to determine next steps.

In the event of unusual system behaviour

1. NOMC to engage ATM Service Adviser to understand and troubleshoot system behaviour
2. If able to be understood and explained, ATM Service Adviser to advise partner on issue and options for resolution
3. If unable to be easily understood in a timely manner, partner to raise request in Jira for resolution with the vendor.
4. If behaviour is causing significant impact on operations, NOMC in conjunction with the ATMD, to triage impact considering:
   a) Number of flights impacted (e.g. size of the carrier)
   b) Extent of impact on the airport/s in terms of timing, traffic, etc
   c) Extent of the system behaviour impact on other airlines (if at all)
5. If significant no. of flights and / or other partners impacted, the NOMC will initiate an A-CDM teleconference to determine next steps.

A.2 Recovery procedures (in the event of system failure / unusual system behaviour)

A.2.1 Scenario 1: Some partner systems down / A-CDM rules continue to be enforced

PROCEDURE

1. SAAB/Airservices Service Desk will inform Partner service restored.
2. Partner compares Workspace with Native System to ensure accuracy.
3. Partner informs SAAB and Airservices Service Desk service restored.
4. Partner resumes normal Workspace interaction and compliance.
5. Partner closes fault with SAAB/Airservices Service Desk.

A.2.2 Scenario 2: Airservices system / some partner systems down / A-CDM rules compliance suspended

PROCEDURE

1. SAAB or Airservices Service Desk will inform the Partner with the open fault that service is restored.
2. NOMC will advise all partners that the service is connected awaiting A-CDM Procedures Resumption time.
3. ATC update runway configuration, constraints and region closures.
4. Relevant Partners compare workspace Information for accuracy with displayed flight information.

5. NOMC will inform Partners and ATC of A-CDM Compliance Resumption time.
6. ATC will consider advertising A-CDM Compliance resumption time on ATIS.

A.2.3 Scenario 3: Unusual system behaviour / A-CDM rules compliance suspended

PROCEDURE

1. Airservices Service Adviser or NOMC or Saab will confirm that the unusual system behaviour has been resolved (understood or fixed if a defect)
2. NOMC will advise all partners that the unusual system behaviour has been resolved (understood or fixed if a defect) and awaiting A-CDM Procedures Resumption time.
3. ATC update runway configuration, constraints and region closures.
4. NOMC will inform Partners and ATC of A-CDM Compliance Resumption time.
5. ATC will consider advertising A-CDM Compliance resumption time on ATIS.