



Changi Airport A-CDM Handbook



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1. Introduction

This handbook is an extract from the Changi A-CDM Manual.

It explains the Changi A-CDM model for operational staff and crews, focussing on Target Off-Block Time, Target Start-up Approval Time, the supporting IT systems, and the pre-departure process.

2. What is Airport Collaborative Decision Making?

Airport Collaborative Decision Making (A-CDM) is an essential enabler to reduce delays at airports, improving the predictability of events and optimising the utilisation of resources and airport infrastructure.

The key objectives of implementing A-CDM in Changi Airport are to improve gate management, flight punctuality, resource management and taxiways congestion which would result in improved operational efficiency and reduce-costs for the entire airport community.

This aim is achieved via improved real time information sharing between airport operator, airlines, ground handlers and air traffic control (ATC). Sharing inbound and turnaround information in a collaborative process will improve predictability of subsequent events such as arrivals and off-blocks.

3. Operating concept at Changi

Based on an accurate prediction of aircraft readiness for departure, from the ground handlers and airlines, ATC can plan the optimal pre-departure sequence at which aircraft are dispatched from the parking stands. This dynamic mechanism between the prediction of when all ground handling activities will end (**Target off Block Time**) and the pre-departure sequencing (**Target Start-up Approval time**) is the core pillar of Changi A-CDM.

a) Target off Block Time (TOBT)

TOBT Definition

The time that Airlines and / or its Ground Handlers estimate that an aircraft will be ready for departure – all aircraft doors are closed, boarding bridge disconnected, pushback tow-tug is in place and ready to start-up / pushback upon receiving the ATC clearance.

TOBT is the most important timing of the turnaround process and this timing is essential for the calculation of TSAT. The TSAT is derived based on optimisation aircraft ground movement and minimisation of apron congestion on taxiways.

TOBT can be predicted by tracking the flight events 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 partners are needed.

TOBT is initially automatically calculated by the Airport Operations Central System (AOCS) based on the flight arrival information. Subsequently, airlines and ground handlers will coordinate and update it based on the operational situation.

Who is responsible for the TOBT?

Changi A-CDM assumes that the many parties involved in the turnaround process contribute to departure readiness. In order to get good quality TSATs, airlines need to ensure that a timely, accurate and stable TOBT is provided.

Airlines could update the TOBT or assign this responsibility to their ground handling agent. In either case, it is the airline's responsibility to ensure the procedures and workflow of coordinating TOBT submission is in place.

TOBT updating process

Airlines and/or ground handlers must understand and adhere to this process in reporting TOBT.

- 1) **“Automation” phase:** TOBT will be derived by the IT systems based on flight arrival information.
- 2) **“Confirmation” phase:** Airline and/or ground handlers to confirm the validity of system generated TOBT at least 40 minutes prior to departure.
- 3) **“Manual update” phase:** Airline and/or ground handler to manually update TOBT with differences of 5 minutes or more.

When and how TOBT is generated?

TOBT calculation starts 2 hours before the filed flight plan time (Estimated Off-Block Time or EOBT) and will be continuously improved based on the update of the Estimated Landing Time, or ELDT.

Why is manual TOBT needed?

The system 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, airlines and ground handlers are required to continuously assess the operational situation and update TOBT if needed.

When to update the manual TOBT?

TOBT can be manually updated whenever it is needed throughout the turnaround process. At 40 minutes prior to departure, initial TOBT can be assessed as most of the turnaround activities have started. Starting from that moment, TOBT will be used for the calculation of pushback sequence of the flight. Any change in TOBT by 5 minutes or more will potentially impact the calculation of TSAT. Hence, TOBT needs to be monitored and actively updated if there is a change of more than 5 minutes based on the progress of the turnaround activities.

What IT systems are supporting the TOBT update?

In Changi, there are two ways to update the TOBT. It can be updated on the “Gate Message Input Device” (GMID) at the gate hold rooms, or via the online web portal “Airport Operations Central System” (AOCS).

How will TOBT be disseminated to all stakeholders?

At 40 minutes prior to departure, TOBT will be published via these channels:

- On the online AOCS A-CDM portal
- On the GMID at gate hold rooms
- On the Aircraft Docking Guidance System (ADGS) display panel located in front of every aircraft parking stands

For flights at remote stands without ADGS, a different set of procedures will be required to communicate the TOBT to the various stakeholders. We recommend that TOBT be communicated to the crew via Passenger Name List (PNL). Update of TOBT can be done by the radiotelephony communication between pilot, apron and the Operations Control Centres of the ground handlers.

When does TOBT deletion occur?

The TOBT may be deleted when certain circumstances render the TOBT unknown. One possibility is that the aircraft experiences technical problems and the expected delay is unknown. In this scenario, the airlines and / or ground handlers would have to delete the existing TOBT until a new TOBT becomes available.

b) Target Start-Up Approval Time (TSAT)

TSAT Definition

The time provided by ATC, 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 / push back approval.

Prior to A-CDM, ATC does not have accurate information of departure readiness in advance as pilots request for pushback clearances only when the flight is ready. Thus, ATC was unable to forecast actual runway demand, which could help to manage departure queues at the runway holding points.

With A-CDM, we target 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.

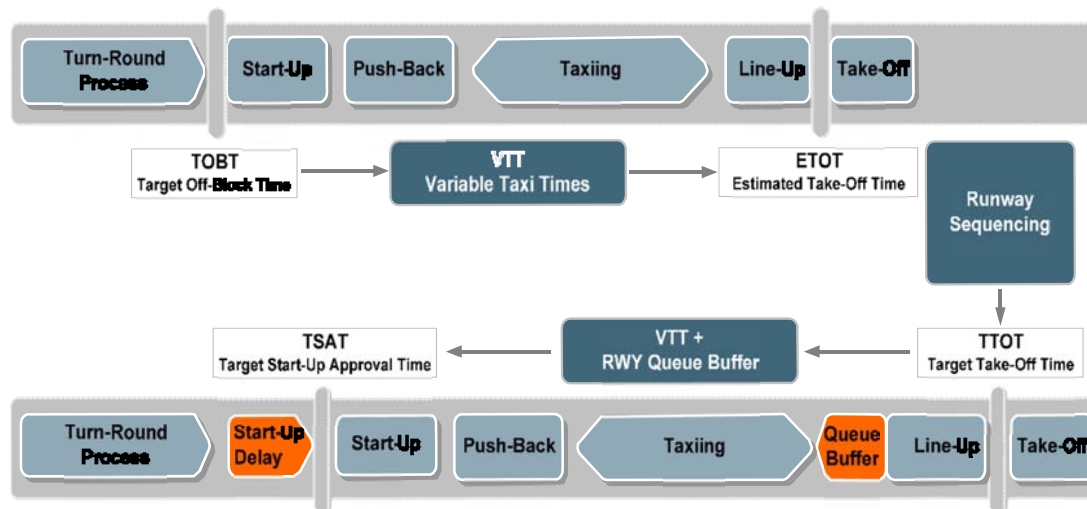
By adopting pre-departure sequencing, we expect to reduce the aircraft waiting time at the runway holding points, reduce fuel consumption on the taxiways and improve the passenger experience by having a smoother departure flow.

How is TSAT calculated?

TSAT is the optimisation of the times that aircrafts are planned to depart from the parking stands. TSAT is calculated by the Pre-Departure Sequencer (PDS) based on the TOBT input from the airlines and ground handlers. In Changi airport, the TSAT algorithm considers these key parameters:

- Flight status e.g. VVIP, Medi-Vac flights
- CTOT status e.g. BOBCAT (AWUT) flights
- TOBT and Variable taxi time
- Parking bay allocation
- Wake turbulence category and minimum separation between departures
- Runway configuration and availability

Please refer to below diagram for illustration of the TSAT calculation:



**A suitable runway queue buffer is incorporated into the calculation to ensure sufficient runway pressure, taking consideration of unavoidable process uncertainties (varying start-up and push back durations, taxi speeds etc.). As a result, small departure queues are always maintained to guarantee adequate demand at the runway and also to balance the waiting time between the runway holding point and parking stand.*

When does TSAT calculation start?

At 40 minutes prior to departure, PDS will calculate the first pre-departure sequence based on TOBT input from airlines and ground handlers. Subsequent TOBT updates triggers a recalculation until the TSAT frozen period. A TSAT is considered as frozen when current time is equal to or less than TSAT - 5 minutes.

How will the TSAT be communicated to various stakeholders?

At TOBT – 25 minutes, the TSAT will be published via these channels:

- On the online AOCS A-CDM portal
- On the GMID at gate hold rooms
- On the Aircraft Docking Guidance System (ADGS) display panel located in front of every aircraft parking stands

For flights at remote stands without ADGS, TSAT will be communicated to pilots through radio via GHA/AO or by ATC upon issuance of ATC clearance.

What happens if the aircraft is not pushed back at TSAT + 5 minutes?

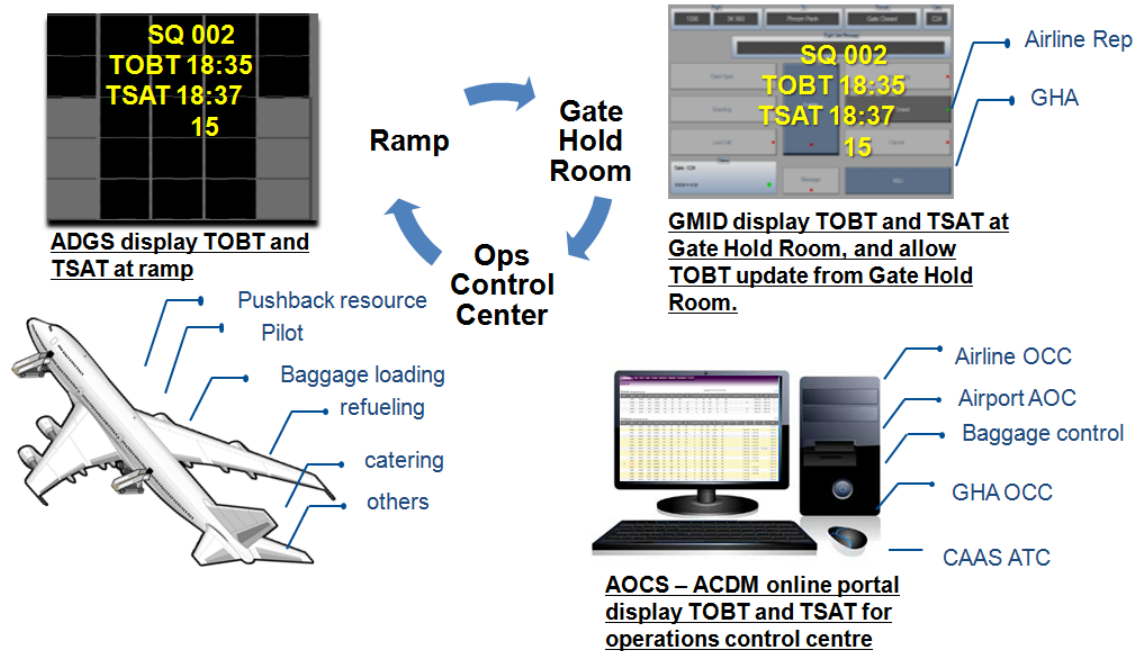
Pilots should monitor the flight turnaround progress and ensure the aircraft is ready to pushback at TOBT. At TSAT+5 minutes, if a pushback request has not been made, ATC clearance and TSAT will be cancelled. AO/GHA is required to submit a new TOBT and once PDS receives the update of new TOBT, a revised TSAT will be issued.

4. Overview of Changi A-CDM process

a) Summary of TOBT-TSAT procedures supporting Changi A-CDM

Time	Event	Description
TOBT – 40 minutes to TOBT	Continuous monitoring and updating of TOBT	<ul style="list-style-type: none"> • PDS calculates TSAT and TTOT • Optimum TSAT generated based on TOBT • Best planned best served philosophy
TOBT – 25 minutes	TSAT published on AOCS and ADGS	<ul style="list-style-type: none"> • Possibility of TSAT changes as the PDS is constantly calculating an optimal sequence with new TOBT updates and real-time traffic situation (can go 2 ways; earlier or later)
TSAT – 5 minutes	TSAT frozen (by PDS)	<ul style="list-style-type: none"> • TSAT will not change, even if preceding aircraft drop-out of the departure queue, this ensures stability and predictability of TSAT issued • Pushback tow-tugs to be available for aircraft at TOBT • Any TOBT changes after the TSAT frozen window /with TOBT>TSAT/ will result in new TSAT allocated outside the frozen window <ul style="list-style-type: none"> ○ Airlines and ground handlers are advised to revise the TOBT early if TSAT cannot be achieved. Late revision of TOBT would lead to a less optimal TSAT. ○ Note: <ol style="list-style-type: none"> 1. A new TOBT later than the previously published TOBT and earlier or equal to TSAT does not lead to a TSAT update 2. A new TOBT later than TSAT leads to a TSAT update
TOBT – 5 minutes	A-CDM Start-up Procedure	<ul style="list-style-type: none"> • Aircraft call Clearance Delivery for ATC clearance @ TOBT-5' • ATC will advise changes in TSAT if any due to air traffic clearance restrictions or flow measures
TSAT	AOBT (by ADGS)	<ul style="list-style-type: none"> • Aircraft call Ground Control for pushback request • Aircraft commences pushback
TSAT + 5 minutes	Latest AOBT event (by ADGS)	<ul style="list-style-type: none"> • ATC clearance and TSAT will be cancelled. Aircraft is required to submit a new TOBT before requesting for a new ATC clearance • PDS will re-compute new TSAT based on the new TOBT • Aircraft to re-coordinate for new ATC clearance based on the new TOBT.

b) Overview of systems supporting Changi A-CDM



Airport Operations Central System (AOCs): A-CDM online portal

AOCs is an online portal CAG created to support A-CDM information sharing. It can be used by operations control centre (OCC) to view and update A-CDM TOBT information. The portal could be accessed via <http://aoc.changiairport.com/>. Eligible airlines and ground handlers shall apply for AOCs account by writing to CAG IT division (refer to the relevant contact at the end of this handbook or email a-cdm@changiairport.com)

A screenshot of A-CDM portal is captured in below.

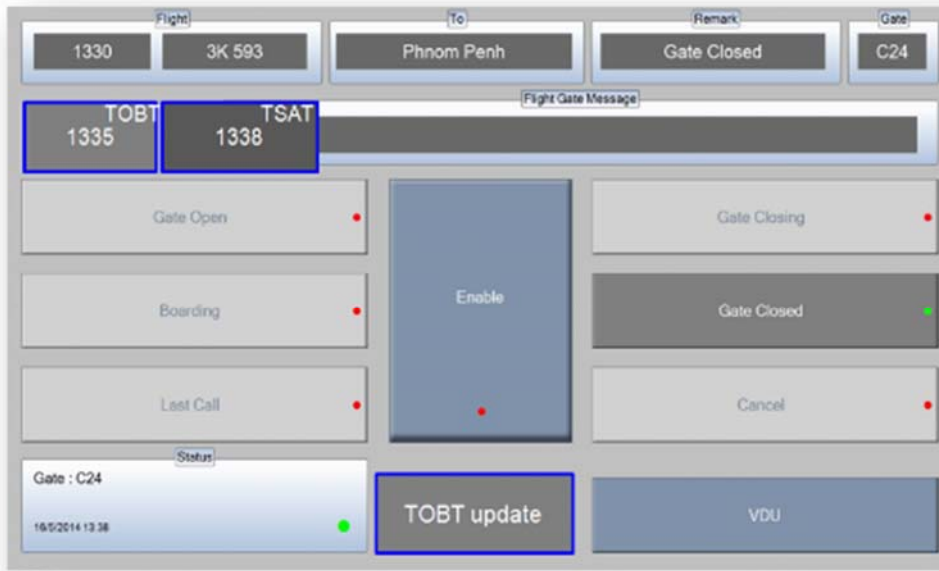
Arrival (Showing 292 records)										
Flight	Type	Status	Stand	Terminal	ORG	ELDT	ALDT	SIBT	EIBT	AIBT
SQ955	B773	IBK	E28	T2	CGK	11:56 / 16	11:56 / 16	11:55 / 16	12:02 / 16	12:03 / 16
BR225	B773	IBK	C22	T1	TPE	12:00 / 16	12:01 / 16	12:00 / 16	12:05 / 16	12:06 / 16
TR2153	A320	IBK	E5	T2	HKT	12:06 / 16	12:05 / 16	12:20 / 16	12:07 / 16	12:08 / 16
SQ001	-	IBK	A12	T3	SFO	12:03 / 16	12:03 / 16	11:45 / 16	12:08 / 16	12:10 / 16
VN651	A321	IBK	B7	T3	SGN	12:11 / 16	12:12 / 16	12:10 / 16	12:16 / 16	12:17 / 16

Departure (Showing 151 records)										
Flight	Status	Stand	Terminal	DES	GHA	SOBT	TOBT	TSAT	AOBT	ATOT
QZ375	OBK	C18	T1	SOC	DNATA	14:00 / 16	15:36 / 16	15:36 / 16	15:44 / 16	-
HX9702	INI	602	T2	HKG	DNATA	14:20 / 16	17:20 / 16	17:20 / 16	-	-
MI654	DEP	F58	T2	HAN	SATS	15:25 / 16	15:25 / 16	15:25 / 16	15:27 / 16	15:46 / 16
TR2328	DEP	E26	T2	SGN	APS	15:30 / 16	15:30 / 16	15:30 / 16	15:34 / 16	15:54 / 16
TR2112	DEP	F52L	T2	BKK	APS	15:30 / 16	15:30 / 16	15:30 / 16	15:32 / 16	15:51 / 16
MH624	OBK	F56R	T2	KUL	SATS	15:35 / 16	15:35 / 16	15:35 / 16	15:39 / 16	-
EK432	BRD	C22	T1	BNE	DNATA	15:35 / 16	16:00 / 16	16:00 / 16	-	-
MI352	DEP	F59R	T2	PEN	SATS	15:40 / 16	15:40 / 16	15:40 / 16	15:33 / 16	15:53 / 16
MF852	DEP	C16	T1	XMN	SATS	15:40 / 16	15:40 / 16	15:40 / 16	15:28 / 16	15:47 / 16

Gate Message Input Device (GMID): supporting TOBT input from Gate Hold Room

This device is located at the gate hold rooms and is available to the airlines and ground handlers for updating the passenger boarding status. Update of TOBT can be done on the GMID and TSAT is also published on the display.

Below is the screenshot of the GMID display.

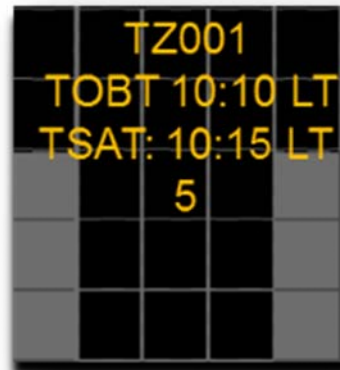


A pin-code is required to unlock GMID for any update of TOBT. CAG will be responsible to distribute the pin-code to the airlines and ground handling agents.



Aircraft Docking Guidance System (ADGS): displaying TOBT and TSAT at ramp

The ADGS is located at the front of every contact parking stands and is visible to cockpit crew and apron staff. To support A-CDM operations, improvements are made to display additional information. The fundamental operation and usage of ADGS still remains the same for cockpit crew. Besides the flight number, TOBT will be displayed 40 minutes prior to departure (timings are in local time). There will be a TOBT countdown timer below the TOBT/TSAT to indicate the number of minutes left to TOBT. At 25 minutes prior to TOBT, the TSAT will be displayed.



5. A-CDM Start-Up Procedures

Changi A-CDM requires pilots to

- 1) Ensure aircraft is ready to push back at TOBT;
- 2) Notify the person responsible to update TOBT, if there is a difference of 5 minutes or more.
- 3) Call Clearance Delivery and request for ATC clearance within 5 minutes of TOBT.
 - a. ATC will update TSAT changes if any upon issuance of ATC clearances. Note that TSAT displayed on ADGS may not be final and can be revised due to en-route clearance restrictions or flow measures.
 - b. Pilot shall only request for ATC clearance provided aircraft is ready to pushback at TOBT. Any updates to TOBT after receipt of ATC clearance will result in cancellation of clearance issued as the ATC clearance validity is based on the initial TOBT.
- 4) Request pushback from Call Ground Movement Control within 5 minutes of TSAT after obtaining ATC clearance.
 - a. ATC may swap pushback sequence based on real-time readiness of aircrafts to maximise apron and runway capacity and reduce the overall delay to traffic as and when required.

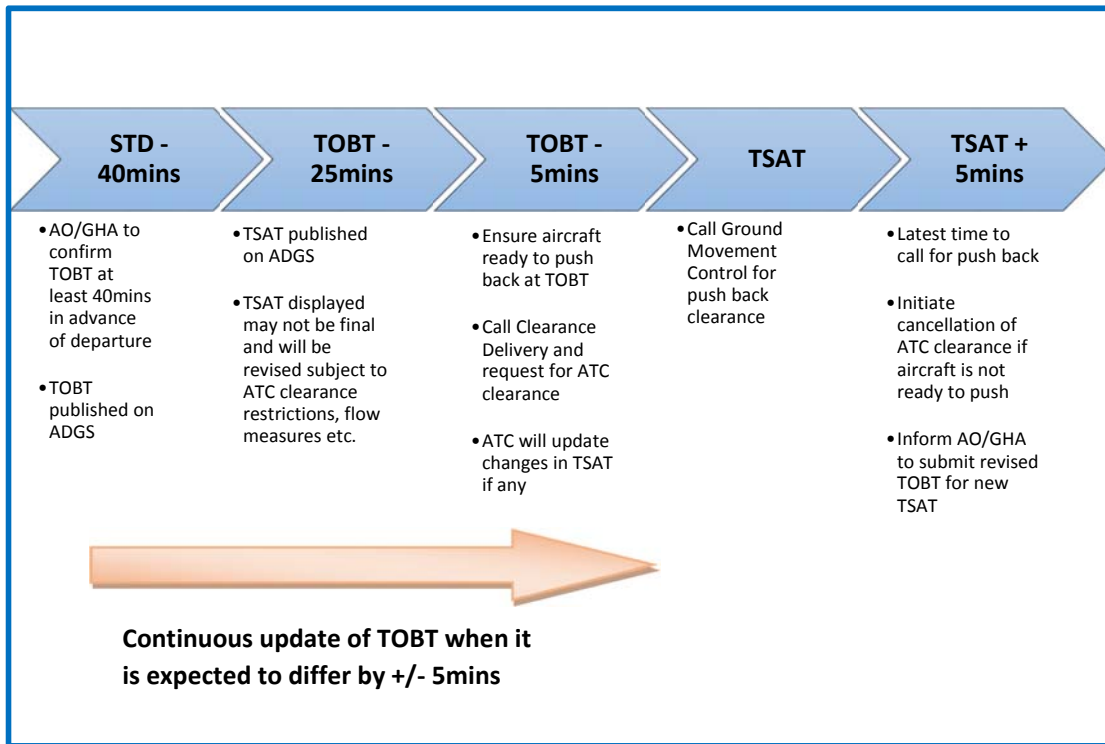
- b. A flight issued with gate hold (TSAT>TOBT) but chooses to commence pushback before the assigned time will be allowed to do so subject to traffic. However, the flight should not expect an earlier departure time as the planned pre-departure sequence will be maintained.
- 5) Initiate cancellation of ATC clearance and notify the person responsible to update TOBT, if a flight is unable to pushback by TSAT + 5min due to readiness of aircraft.
 - a. Non-compliance to initial TSAT may result in an aircraft losing its existing position in the pre-departure sequence. Delays can be expected as a result of re-sequencing based on new TOBT input.
 - b. Flight will not be allowed to depart until a valid TOBT is entered and revised TSAT is given and complied with.
- 6) Not to initiate TOBT update if delay in pushback is due to ground traffic or ATC clearance restrictions. The ATC clearance will remain valid even if it exceeds TSAT + 5 minutes.

Reversion to non-CDM start-up procedures

To achieve seamless and immediate transition back to non-CDM operations due to unforeseen situations, the following procedures are to be followed if TOBT and TSAT become unavailable due to system issues or maintenance.

- If TOBT cannot be submitted or informed through different means stated in section 3 above (AOCS, GMID, ADGS), Pilots shall follow the current (non-CDM) pushback procedures published in Singapore AIP page AD 2-23 which is to request for ATC clearance when aircraft is ready to pushback within 5 minutes.
- If TSAT is unavailable through different means (ADGS, AOCS, GMID), AO and GHA will still continue to submit TOBT and pilots shall request for ATC clearance 5 minutes within TOBT. ATC will revert to gate hold procedures published in Singapore AIP page AD 2-25 and issue estimated pushback times accordingly when required.
- In the event that A-CDM operations need to be cancelled due to any reason, the termination will be communicated by the trial management unit to relevant parties through email and a NOTAM will be issued.

The flow chart summarizes the procedures described above.



6. Acronyms

Terminology	Definition and description	Responsibility
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 airline in the flight plan	Airline and Ground handler
ELDT	“Estimated Landing Time” the estimated time at which the aircraft will touchdown on the runway	SITA movement message, ACARS, Local Radar System
SOBT	“Scheduled Off Block Time” The time that an aircraft is scheduled to depart from its parking position; associated with the Airport slot allocated	Slot coordinator
TOBT	“Target Off Block Time” The time that an Aircraft Operator or Ground Handler estimates that an aircraft will be ready, all doors closed, boarding bridge removed, push back vehicle available and ready to start up / push back immediately upon reception of clearance from the control tower	Airline and Ground Handler
TSAT	“Target Start-up Approval Time” The time provided by ATC taking into account TOBT, CTOT and/or the traffic situation that an aircraft can expect start-up / push back approval	Air Traffic Control
CTOT	“Calculated Take Off Time” The time calculated and issued by the appropriate air traffic flow management unit, at which a flight is expected to become airborne	Air Traffic Control
PDS	Pre-departure Sequencer	Air Traffic Control
AOCS	Airport Operations Central System	CAG
GMID	Gate Message Input Device	CAG
ADGS	Aircraft Docking Guidance System	CAG

7. Contact information for further enquiry about A-CDM

Name	Company	Email	Number
Mr. Oliver Kieseletter	CAG	Oliver.kieseletter@changiairport.com	6541 2153
Mr. Gan Heng	CAG	Gan.heng@changiairport.com	9668 6246
Mr. Zhao Fucai	CAG	Zhao.fucan@changiairport.com	8533 1296
Mr. Jeff Ho	CAG	Jeff.ho@changiairport.com	8181 0591
Mr. Kwek Chin Lin	CAAS	Kwek_chin_lin@caas.gov.sg	65412664
Ms. Chan Hwee Tuan	CAAS	Chan_hwee_tuan@caas.gov.sg	65956057
Mr. Roger Lau	CAAS	Roger_Lau@caas.gov.sg	9767 0497

Changi Airport Collaborative Decision Making (A-CDM) For Operational Staff

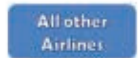
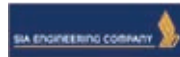


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Section A: Overview of A-CDM

Ground
Handler



Airlines



The **BEAUTY**
of information is
in **Sharing** it



CAAS



CAG

- **A-CDM** is a collaborative initiative which needs full participation from **all airport partners**. It requires airlines and their appointed ground handler to share the best **prediction** of departure readiness, which enables Air Traffic Control to **optimise** the pushback sequence from the parking stand.

- A-CDM helps improve **on time performance**, optimises push-back sequence to **reduce taxing time** and taxiway congestion, enhances situational awareness for **improved passenger experience**.

- The two key elements for A-CDM are **Target Off-Block Time (TOBT)** and **Target Start Up Approval Time (TSAT)**.

(See next pages)

Overview of A-CDM: Target Off Block Time (TOBT)

What is a Target Off-Block Time (TOBT)?

The time that an Airline or Ground Handler estimates that an aircraft will be ready for immediate pushback upon receiving clearance from Air Traffic Control.



All Doors Closed



Boarding Bridge removed



Pushback Vehicle Available and ready

Why is TOBT important?



Facilitates understanding or real-time ops situation.



Provides better predictions of aircraft readiness for pushback.



Allows Air Traffic Control to optimize pushback sequence to minimize apron & taxiway congestion.



Who is responsible for the TOBT input?

Airlines or Ground Handlers appointed by airlines who have updates regarding aircraft readiness.

Collaborative Information Sharing is Key!

Overview of A-CDM: Target Start-up Approval Time (TSAT)

What is Target Start-up Approval Time (TSAT)

is the time provided by ATC when an aircraft can expect to pushback.

How is TSAT calculated?

TSAT is calculated by ATC's Pre Departure Sequencer (PDS) at Changi Tower. It is derived based on the real time traffic situation on the runway and taxiway, and TOBT submitted by airlines and ground handlers

How does TSAT help?

With A-CDM, a common situational awareness is created amongst stakeholders, where TOBT & TSAT can allow better predictions of aircraft readiness for pushback.



Improved flight pushback timing.



Reduced taxi time and waiting time at runway holding point.

Section B: A-CDM Procedure for airline and ground handling agent

A-CDM Procedures for Airlines and their appointed Ground Handling Agent (GHA)

Countdown to Departure



CAG systems automates TOBT based on arrival information. TOBT will be displayed at various key touch points, i.e. ramp, gate hold room, ops control centre.

Airline or their GHA to assess system generated TOBT. If it is not accurate, update TOBT.

TSAT, which is generated based on TOBT, will be displayed on systems at GHR, Ramp, and OCC.

ATC continues to optimise the traffic planning, hence, TSAT may be changed subject to real time traffic situation.

Airline or their GHA continue to monitor the progress of the turnaround activity, coordinate and update TOBT if needed.

Airline or their appointed GHA to ensure aircraft is ready for pushback at TOBT.

If TOBT is not achievable, a revised TOBT shall be submitted.

Pushback Tug should have been deployed on site.

Airline or their appointed GHA to ensure aircraft is now ready for pushback.

- Aircraft door is closed.
- Aerobridge is removed.
- Pushback Tug is attached to the aircraft.

Pilot should have obtained pushback clearance from ATC.

GHA to follow pilot's instruction for pushback.

If pilot doesn't give pushback instruction by TSAT + 5 minutes, ATC will cancel TSAT. A revised TOBT to reflect the delay shall be submitted in order to obtain a new TSAT.



Airline or their appointed GHA continue to monitor TOBT, coordinate and update it if the prediction of aircraft readiness is more than +/- 5 minutes.

Section C: A-CDM Procedure for Pilot

A-CDM Procedures for Pilot

Countdown to Departure



TOBT updated by Airline or Ground Handler Agent (GHA) will be reflected in the Aircraft Docking Guidance System (ADGS) for pilot's advanced information.

Pilot to assess if TOBT is achievable. If not, inform Airline or GHA for TOBT revision.

TSAT, which is generated based on TOBT, will be published at ADGS for pilot's advanced information.

TSAT may not be final and will be revised subject to TOBT revision, flow measures, etc.

Pilot to continue to assess if TOBT is achievable. If not, inform Airline or GHA for TOBT revision.

Pilot to call Clearance Delivery and request for ATC clearance.

Pilot to ensure aircraft ready to push back at TOBT. If not ready, inform Airline or GHA to update TOBT.

Pilot to call Ground Movement Control for pushback clearance.

Latest time for pilot to call for pushback clearance.

If pilot does not call for any pushback request by TSAT + 5 min, TSAT and ATC clearance will be cancelled.

Pilot has to inform Airline or GHA to submit revised TOBT for new TSAT before requesting for a new ATC clearance.

Section D: Changi A-CDM supporting systems

Key supporting systems: Airport Operations Central System (AOCS)

AOCS is an online web portal which allows partners to view flight information, such as the real time traffic on the tarmac, TOBT and TSAT for the departures. It also allows the airlines or their ground handlers to input TOBT.

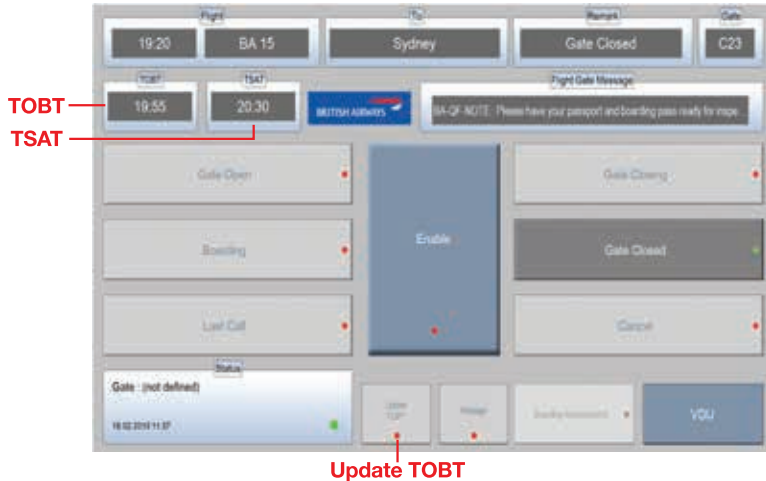
Flight info.		Aircraft info.		Movement info.			Planned Timings		
Flight NO.	ADES (ICAO)	Type (ICAO)	Type (IATA)	Terminal	Parking Position	SOBT	TOBT	TSAT	
M936	ZUAA	8738	738	2	E22	12:45:00	12:45:00	12:45:00	
34207	WII	A320	320	1	C17	12:50:00	12:50:00	12:50:00	
SQ247	YMWL	A333	333	3	A1	12:40:00	13:00:00	13:00:00	
TR2324	VVTS	A320	320	1	E2	13:00:00	13:00:00	13:00:00	
U8002	YRGN			3	A12	13:00:00	13:00:00	13:00:00	
TR2106	VTBS	A320	320	2	E1	12:45:00	12:45:00	12:47:43	
MH842	WBGG	8738	738	2	E3	12:50:00	12:50:00	12:50:00	
TG404	VTBS	8744	744	1	D47	12:25:00	12:25:00	12:25:00	
SQ958	WII	8773	773	2	E11	12:30:00	12:30:00	12:33:00	
FD377	VTSF	A320	320	1	C26	13:05:00	14:20:00	14:20:00	
SC616	RUB	A333	333	3	A21	14:05:00	14:05:00	14:09:00	
QJ663	WIS	A320	320	1	D48	13:40:00	14:05:00	14:05:00	
AK710	WMKK	A320	320	1	D44	14:05:00	14:05:00	14:05:00	
C1754	ICTP	A333	333	3	A9	14:05:00	14:05:00	14:05:00	
GAB31	WII	8738	738	3	A19	14:05:00	14:05:00	14:05:00	
SC634	RJT	8773	773	3	B3	14:05:00	14:05:00	14:05:00	
CK712	VTBS	877W	77W	1	D96	14:00:00	14:00:00	14:00:00	

TOBT

TSAT

Key Supporting System: Gate Message Input Device (GMID) at T1/T2 Gate Hold Room

GMID is an existing equipment located at the gate hold room in T1 and T2. Airlines utilizes this equipment to view TOBT and TSAT, as well as update TOBT.

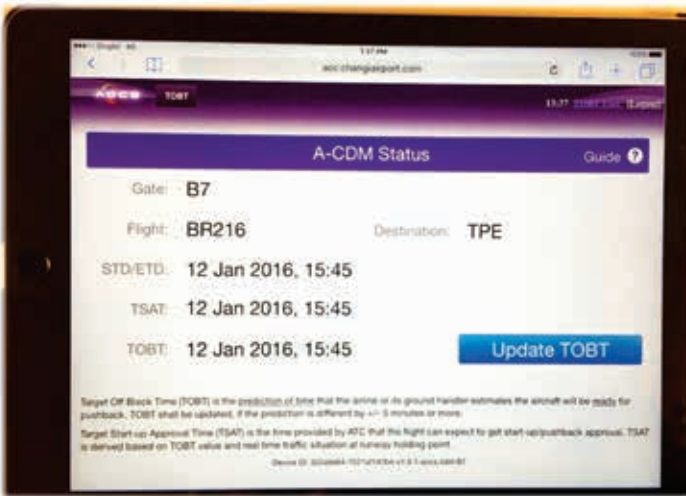


Tips: 4 steps to submit TOBT

- 1) Click "Enable"
- 2) Click update "TOBT"
- 3) Enter 4 digit password
- 4) Enter revised TOBT

Key supporting systems: AOCS Ipad App in T3 Gate Hold Room

AOCS Ipad App is an GMID equivalent tool for airlines to view TOBT and TSAT, as well as to update TOBT from T3 Gate Hold Room.



Tips: 3 steps to submit TOBT

- 1) Click "update TOBT"
- 2) Enter TOBT value
- 3) Enter 4 digit passcode and submit TOBT

Key Supporting System: Aircraft Docking Guidance System (ADGS)

ADGS is an existing system to guide aircraft taxi-into stand. It was upgraded to display A-CDM key elements – TOBT and TSAT. Key features include:



- Flight number – first line
- TOBT – second line
- TSAT – third line
- Count down to TOBT (min) – fourth line
- “LT” stands for local time
- The display scrolls from left to right.

Tips for ramp staffs: If you are not able to complete your activity by TOBT, please report it to the designated person for revised TOBT submission.

Section E: Key Contact Personnel

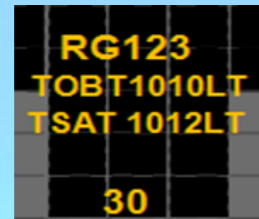
Matters	Designation	Email	Tel No.
A-CDM lead	Oliver Kiesewetter Vice President, Airside Operations	oliver.kiesewetter@ changiairport.com	6541 2153
For Procedures and Training	Gan Heng Assistant Vice President, Airside Operations	gan.heng@ changiairport.com	6541 2783
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For A-CDM Systems	Jeff Ho Manager, IT division	jeff.ho@ changiairport.com	8181 0591
For ATC related procedures	Chan Hwee Tuan Deputy Chief, Changi Tower	chan_hwee_tuan@ caas.gov.sg	6595 6057
For ATC related procedures	Roger Lau ATC manager, Changi Tower	roger_lau@ caas.gov.sg	9767 0497

Target Start-up Approval Time

WHAT is TSAT?

the time provided by ATC after taking into account TOBT and the traffic situation when an aircraft can expect start-up / pushback approval

WHERE to view TSAT?



Aircraft
Docking
Guidance
System



Gate
Message
Input
Device

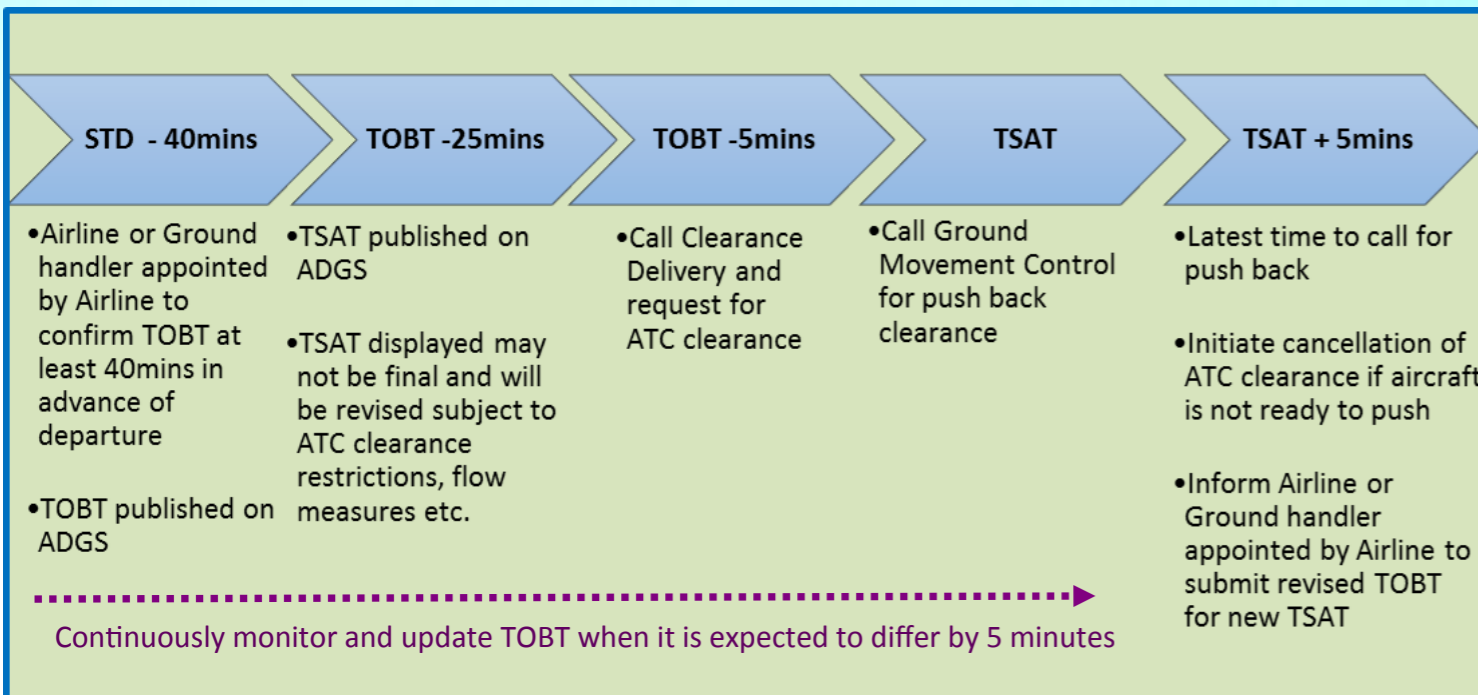
BENEFITS

- Improved flight punctuality
- Airline Fuel Saving
- Better Resource Planning

Changi A-CDM

Putting TOBT and TSAT together

For enquiries regarding Changi A-CDM, please contact: a-cdm@changiairport.com



Understand Changi A-CDM

The **POWER of A-CDM** is to regulate turnaround information sharing for better **prediction** of push-back readiness, which enables ATC to **optimize** the departure sequence and reduce take-off waiting time at runway holding point.

Airline and Ground Handlers' Role

- Coordinate between various operational stakeholders and submit

Target Off Block Time

ATC's Role

- Optimise the push-back sequence and issue **Target Start-up Approval Time** to airlines

Airport's Role

- Provide various systems to support A-CDM information sharing.
- Better stand and gate allocation based on TOBT and TSAT.



Target Off Block Time

For enquiries regarding Changi A-CDM, please contact: a-cdm@changiairport.com

1. WHAT is TOBT?

The best **prediction** of time that an aircraft will be **ready for push-back**.

At TOBT,

- All doors closed
- PLB removed
- Pushback Tug ready

2. WHO shall update?

Airline or **Ground Handler** appointed by Airline

3. WHERE to update?

AOCS Web-based portal at airline or handlers' control center

OR

GMD Device at Gate Hold Room



4. WHEN to update?

40 Prior to STD for first TOBT update
minutes

Subsequent TOBT update if it is different by more than **05** minutes

Two STEPS to Handle TOBT



1. Referring to existing TOBT, assess if there is a need to update it based on your best prediction of activity completion time. If yes,
2. Report the delay to the airline or ground handler appointed by airline to submit revised TOBT.



Different airlines may have different TOBT coordination models. Please check with your A-CDM manager for more details.