Collaborative Decision Making (CDM)
- Air Traffic Flow Management (ATFM)
Concept of Operations
V3.0

Ensure document is current before use.

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.Approved	Jason Harfield	General Manager, Air Traffic Control Group		10/2/2010

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1. Document History

Version	Date	Editor	Comments
1.1	22/01/2010	John Terlich	Amalgamation of previous Index documents.
1.2	27/01/2010	Anthony Gunton	Editorial update
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2.2	9/02/2010	John Terlich	Editorial Update

2. Acronyms/ Terms and Definitions

Acronym/ Term	Definition
ACA	Airport Coordination Australia
A-CDM	Airport Collaborative Decision Making
A/DMAN	Arrivals/Departure Management
AFP	Airspace Flow Program
AFTN	Aeronautical Fixed Telecommunication Network
AIP	Aeronautical Information Publication
Airborne Delay	The difference between the runway ETA measured at 200nm destination and the ATA on runway
Airspace User	Airline, pilot, cargo, business, general aviation, military,
ANSP	Air Navigation Service Provider
AOBT	Actual Off Block Time – Time an aircraft pushes back/ vacates the parking position. (Equivalent to airline ATD)
AsA	Airservices Australia
ATC	Air Traffic Control
ATD	Actual Time of Departure. Airline terminology for aircraft time off parking position
ATFM	Air Traffic Flow Management
ATFM PO	Air Traffic Flow Management System – Post Operational mode. Enables reporting.
ATFM RT	Air Traffic Flow Management System – Real Time display
ATFM System	A number of integrated software applications to support ATFM CDM
ATM	Air Traffic Management
ATS	Air Traffic Services
CADAS	Comsoft product for data entry and display of aeronautical messaging and aeronautical information services

Acronym/ Term	Definition
Cancelled Flights	Flights which were scheduled or Flight planned to operate but which are cancelled due to Airline internal issues or *ATFM System* capacity issues
CASIF	Capacity and Service Improvement Forum
CDM	Collaborative Decision Making is improved information management which provides the foundation for a more extensive and comprehensive exchange of real-time information between ATM, the aircraft operators and airports during all phases of flight. Decision-making will be based on the sharing of real-time data about actual events that incorporate preferences and constraints. Decisions will be of better quality allowing more flexible responses and enabling greater efficiencies on both a network-wide and individual flight basis. (Abstract Of The Eurocontrol AAATM Strategy For The Years 2000+ Information Management Requirements)
CDM Member Airport(s) (CDMMA)	An airport where the administration has agreed to become a CDM Member
CDM Member Airspace User(s) (CDMMAU)	An airline, charter service or other airspace user that has agreed to become a CDM Member
CDM Member(s)	An organisation or individual who has signed agreement to the ATFM CDM business rules and will be an active participant.
Co2	Carbon Dioxide
COBT	Calculated Off Block Time. This time is the CTOT less the taxi time to the departure runway. It is the time the airline can expect to leave it's parking position under a TMI.
CONOPS	Concept of Operations

Acronym/ Term	Definition
Compliance (Compliant)	Compliance is a measure of the difference between an aircraft's actual operating time and the programmed time in ATFM. The variance required to be nominated "compliant" will be defined in Business Rules
CR	Coordinated Routes
CTMS	Centralised Traffic Management System
CTOT	Calculated Take Off Time. This is only sent to ATC and is used to manage the departure of aircraft from the RWY. Typically; this time is *COBT*+ taxi time to the departure runway. Where an airport does not have a control Tower, then *CTOT* shall not be utilised.
Defence Exempt	An exception to a business rule where the subject generally includes Defence as a member (i.e. *CDMMAU* and ATC).
Demand	The number of aircraft that require an airport resource or airspace in a defined period.
Eurocat SMR	Australian ATC system interface to the surface movement radar
GDP	Ground Delay Program. A system of delaying departing traffic to meet programmed enroute or arrival times.
Ground Delay	The difference in time between the SOBT and the AOBT
GS	Ground Stop. A system of stopping departing traffic until an enroute or arrival time becomes available.
FPL	Information distributed by AFTN describing the intention to operate a flight, specifically; Flight Plan

Acronym/ Term	Definition
Holding Fuel Recommendation Accuracy	The accuracy with which Holding Fuel traffic advisory information is predicted by the system
InDeX	Integrated Data Exchange Program
MAESTRO	A multi airport decision making tool for sequencing arrivals
MEL	Minimum Equipment List – permits aircraft to remain operating with known defects that do not affect safety
NAIPS	National Aeronautical Information Processing System
National Airways System	The system of airports, airways, ATS services and NAVAIDS which encompass the Australian Aviation industry
NOC	National Operations Centre (Airservices Australia)
Non CDM Member Airspace User(s)	An airspace user who is not a signatory of the CDM Member Business rules
Non CDM Member(s)	Aviation Industry user which is not a signatory of the CDM Member Business rules
NOS	National Operations Centre Operations Supervisor
NOTAM	Notice to Airmen
OAG	Official Airline Guide
OIS	Operational Information System. This system will be used to display operational information to Line Controllers at their workstation
POBT	Planned Off Block Time. The time that a flight plans to leave its parking position. This may be the same time as the SOBT if not altered on the day of operations by the airline
Pop-Ups	Aircraft which have not lodged a Flight Plan or schedule at the time of planning a Traffic Management initiative.

Acronym/ Term	Definition
Predictability	Predictability refers to the degree to which an aircraft's operation can be forecast and efficiently planned for in order to reduce the cost of the schedule deviation
Pre-tactical	Less than two days before flight
Pre-tactical Demand	Airport or Airspace Volume Demand which is assessed in the Pre-tactical timeframe
Pre-tactical Flight Schedule Information	Flight schedule information describing a specific flight which is sent to the ATFM System
Pre-tactical Flight Schedule(s)	Flight schedule information describing multiple flights which is sent to the ATFM System
PTOL	Programmed Time of Landing
RFDS	Royal Flying Doctor Service
RWY	Runway
SOBT	Scheduled Off Block Time – The time that an aircraft is scheduled to leave it's parking position
SLC	Slot Cancellation Message
SLOT	A time allocated to a flight by ATC for a specific parameter, e.g. departure time, arrival time (at runway or airspace fix)
SM	Shift Manager
Strategic	More than two days before flight
Strategic Demand	Demand assessed in the Strategic Timeframe
SRM	Slot Revision Message
TAAATS	The Australian Advanced Air Traffic System
Tactical	Less than 2 hours before flight
TAF	Terminal Area Forecast
TAS	Technology and Asset Services (Airservices Australia)

Acronym/ Term	Definition
Telecon	Telephone conference
Time Out Delay	Time out Delay is an automatic delay assigned to a flight
Timeslot	A departure or arrival time used to determine operations in the ATFM System
TMI	Traffic Management Initiative. This is a requirement put in place to manage demand and capacity issues. There are three basic TMI: AFP, GS and GDP.
TMS	Traffic Management Specialist
Updated Flight Schedule Information	Changes to flight schedule information already entered into the ATFM System
UPR	User Preferred Route
VSP	Variable Set Parameters

3. Introduction

The Airservices Australia Corporate Plan 2009-14 highlights Airservices' priorities for efficiency, effectiveness and safety. In achieving these priorities the strategic objective "To deliver excellent cost-effective services to customers" has been established including an initiative to "Enhance the capability of the National Operations Centre for strategic management of demand, capacity management and monitoring of ATC and TAS operations".

The key to further improving demand/ capacity management is in utilising all available information from affected stakeholders to support a collaborative environment where all stakeholders participate in determining the best actions to balance demand and capacity. This process is known as Collaborative Decision making (CDM) and Airservices has established a CDM program to progressively implement the necessary processes and tools to support a CDM environment.

The primary elements for the Airservices CDM program are Air Traffic Flow Management (ATFM), Airport Collaborative Decision Making (A-CDM) and Arrivals/ Departure Management (A/DMAN). The CDM program will provide for a progressive implementation of these primary elements to achieve an end-state CDM capability.

As the first of the primary elements, ATFM seeks to provide processes and tools to better support the demand/ capacity balancing capability of the National Operations Centre, through a better understanding of network constraints and collaborative consideration of stakeholder needs and preferences.

3.1. Purpose

This Concept of Operations describes the user needs and proposed operating characteristics of ATFM and the supporting ATFM tool. It is to be used to establish a common understanding for the ATFM system and supporting tool between all stakeholders. The concepts outlined in this document form the basis for establishing detailed operating procedures and ATFM tool functionality to support ATFM.

3.2. Consultation

This document is based on previously approved Concept of Operations documentation that had been derived following consultation with relevant stakeholders.

The documents utilised to form this document were:

- National Operations Centre (NOC), ATFM Concept of Operations (ATFM CONOPS), and
- National Operations Centre (NOC), Concept of Operations, InDeX Stage 1, Phase 2, (ATFM System)

This document has been established to reflect the change in context from the previous Index project to the current CDM program and does not amend the intent of the above documents.

3.3. Referenced documents

The following documents are referenced throughout this specification.

Document ID	Document Title
NOC_CB1-2026	National Operations Centre ATFM Concept of Operations
NOC_CB1-13080	INDEX Stage 1 Phase 2 Concept of Operations
Doc 9854	ICAO Global Operational Concept
	ASTRA Strategic Plan 2007
	Airservices Australia Corporate Plan 2009-14

4. Current capability and situation

4.1. Background

Airports – Managing Demand/ Capacity

Currently, the only major Australian airport that is subject to any form of planned strategic or pre-tactical management of demand/ capacity balancing is Sydney Airport. This balancing is achieved initially via a slot allocation scheme within a legislated framework that permits allocation of slots at a fixed number/ rate per hour.

While the slot allocation scheme provides some form of demand/ capacity rationalisation, the actual daily capacity of Sydney Airport varies dependent upon prevailing weather conditions. To manage this varying daily demand/ capacity, AsA utilises CTMS (Centralised Traffic Management System) within a set of business rules that have been agreed with airline stakeholders. A high level description of the operational characteristics of CTMS and current associated procedures to manage demand/ capacity balancing for Sydney Airport is described in Section 4.2.

With respect to other major capital city airports, actions taken to address demand/ capacity issues is taken on the day of operations (with the assistance of MAESTRO where available) at a stage where the only option to manage over demand is through relatively late notice airborne holding or implementation or short notice ground stops. That is, there is no system support to manage demand/ capacity issues strategically or pre-tactically on a routine daily basis.

The "reactive" methods utilised to manage these demand/ capacity imbalances do not provide customers with operational predictability to enable their planning processes, nor do they enable AsA to plan resource requirements with any degree of certainty.

Airspace – Managing Demand/ Capacity

AsA currently has no formal mechanism/ system to predict demand/ capacity issues for a specific volume of airspace, nor a mechanism/ system that would enable the regulation of the flow of air traffic through a specific volume of airspace.

4.2. Current capability description

In simple terms, for Sydney Airport, CTMS manipulates arrival slots (allocated in advance under the slot scheme) according to the day of operations arrival acceptance rate. Where the arrival acceptance rate is less than the demand driven by allocated slots, CTMS will amend the departure times of flights inbound to Sydney (a ground delay program) to provide a planned arrival acceptance rate equal to that determined by ATC, thereby minimising airborne holding. The key objectives of CTMS are:

- Reduce airborne holding through the conversion of any required delay to ground delay (where demand exceeds capacity)
- Through pre-tactical use of the CTMS, provide airline stakeholders with advance notice of any ground delays to enable their planning processes

While CTMS programming parameters are very much leading edge, the system has been in place since 1998 and is considered "old technology" from a software aspect.

Other major capital city airports are experiencing periods of the day where demand exceeds available airport capacity. Other than day of operations intervention by ATC (with the assistance of MAESTRO where available), there is currently no system/ process in place to manage the demand/ capacity imbalance at these airports and consequently, dependent upon the day of operations arrival rate, significant airborne delays can occur.

5. Justification for and nature of changes

5.1. Justification of changes

Apart from the system and procedures currently in place to manage demand/ and capacity issues at Sydney Airport, there are no other systems or procedures in place to manage demand/ capacity issues through Australian airports or airspace.

Demand/ capacity issues through airports other than Sydney, and through airspace volumes, are mainly managed in a reactive manner that do not support proactive planning by AsA and it's customers and consequential:

i. Unnecessary airborne delays

ii. Increased Co2 emissions

iii. Unpredictable ATC workload

iv. AsA customers being unable to provide their customers with a predictable service

v. Airports and ground handling agencies being unable to react to short notice ad hoc delays

vi. An increase in the operational costs of AsA customers through impacting airline day of operations resource requirements and aircraft maintenance planning.

Point vi. above is a major issue for airline operators. Airline schedules, associated resource requirements and aircraft maintenance plans are complex and are planned months in advance with the key objectives of maximising crew and aircraft utilisation to achieve minimum operational cost. Any unplanned/ short notice delays may have one or all of the following impacts:

Break planned crew connections

Where possible, Flight Crew are assigned to the same aircraft hull so that in the event of a disruption, the aircraft will not be further delayed awaiting Flight Crew ex a delayed flight. However, this approach is not always possible and short notice disruption/ delays have the potential to "destroy" planned Flight Crew assignments and drive the need to call out additional resources at short notice to manage the disruption with a consequential increase in crew costs. Recovery of crew patterns may take days to restore following a major short notice disruption.

Break passenger connections

Standard passenger connection times are set in airline booking systems. Short notice unplanned delays have the potential to induce further airline delays through the delaying of flights awaiting passengers from a delayed connecting flight. The potential also exists for delayed passengers to not reach their destination as planned, thus inducing additional airline costs through passenger accommodation/ meal costs.

E.G. A group of 6 passengers travelling from Adelaide through Melbourne to Los Angeles will have a standard connection time of 90 minutes in Melbourne. Any short notice delay to the inbound Adelaide flight has the potential to delay the Melbourne to Los Angeles flight, or result in the airline Adelaide passengers being rebooked to a later flight that requires the airline to provide accommodation/ meal expenses. Had the

delay to the Adelaide flight been known in advance, through the CDM AFTM System pre-planning process, the airline solution would have been to rebook the Adelaide passengers to an earlier Adelaide Melbourne flight to ensure there was sufficient passenger connection time.

Affect planned aircraft maintenance – this particular aspect is a major problem for airlines as a consequence of any disruption. Aircraft line maintenance is planned days in advance with maintenance resources being rostered/ assigned (specific to the maintenance required). Required spares/ parts are on many occasions flown to a specific maintenance bases in line with the planned maintenance.

One of the options for a major airline to manage disruption is to swap aircraft hulls. While this option often reduces flight delays, it can destroy aircraft maintenance plans as the potential exists for a hull to finish the day's operations in an airport/ maintenance base that cannot perform the required maintenance. This has the potential to temporarily "ground" an aircraft if the maintenance required was time critical, e.g. MEL (Minimum Equipment List) expired.

The CDM AFTM system will provide a mechanism to address the above prime issues through the sharing of information that will enable collaborative tactical measures to be planned/ actioned under an agreed set of business rules/ procedures to proactively and tactically manage demand/ capacity imbalances, thereby minimising day of operations ad hoc reactive measures.

5.2. Description of desired changes (capability identification)

The CDM ATFM System will be deployed to:

- Manage demand/ capacity issues at Australian Class C and D airports. The system will be capable of managing additional airports as required, including non-Australian airports
- Manage demand/ capacity issue through airspace volumes. The system will have the potential to manage neighbouring ANSP airspace.

The CDM ATFM System will have two major capabilities:

- Monitoring capacity/demand
- Managing traffic flows when imbalances occur

The CDM ATFM System monitors flights arriving at and departing from airports and airspace volumes while tracking demand and capacity. When an imbalance exists, users are able to analyse data and model demand management and options to determine the optimal solution for managing the imbalance. Once a solution has been identified, the system permits the other users to view and participate in refining the solution to reach a mutually agreed position.

A high level description of proposed system capabilities is described in Section 6.3

5.3. Additional Capabilities

The CDM ATFM System will have three modes that enable users to view information:

Historical Data Mode

Users must be able to examine historical data to replay a day's events to analyse a day's operations and the effects of any TMIs that may have been implemented.

AFTM System Real-Time Mode (AFTM System RT)

Users must be able to monitor traffic management initiatives (TMIs) as they are executing, with reports including: system performance, and aircraft compliance.

AFTM System Post Operational Mode (AFTM System PO)

Users must be able to access reports which provide a high level summary of the performance of previous TMIs.

Additional detail is provided on these capabilities in Section 6 of this document.

5.4. System Interface

Specific system requirements will be stated in Functional Requirements Documentation.

The CDM ATFM system has many components that will work together using a standard server to provide ATFM support to the controller.

5.5. System Information

Currently, the CTMS accepts the following information:

- Schedule data on a daily basis from all airlines operating routinely through Sydney Airport
- Airframe or registration information
- Sydney Airport slot allocation files from ACA (Airports Co-ordination Authority)
- Where available, Eurocat/ SMR data (runway off/ on times, projected MAESTRO landing times)

The CDM ATFM System will assimilate information from a variety of sources to produce a picture of aircraft intention, actual operation, and a holistic view of airport and airspace capacity.

Aircraft data will be drawn from:

- The OAG (Official Airline Guide)
- Schedule and updated schedule
- Sydney Airport slot allocation files from ACA (Airports Co-ordination Authority)
- FPL and amendments to FPL
- Wind effect on FPL and Schedule data
- Runways, Gate information and standard taxi times

- Airframe or registration information
- Actual aircraft position and speed – Eurocat and surveillance data

5.6. Airline Connectivity

Airlines will have access to information from the CDM ATFM System. Additional detail on possible interfaces is contained in Section 6 of this document.

5.7. System Management

The CTMS application is managed in the AsA National Operations Centre. The CDM ATFM System will also be managed from this centre. Additional detail on System Management is contained in Section 6 of this document.

5.8. CDM AFTM System Roles

CDM AFTM System Roles are defined in Section 6. These roles will be subject to review and consultation with relevant ATC units and stakeholders.

6. Concepts for the proposed system

6.1. Background, objectives and scope

The CDM ATFM System represents a fundamental shift in the management of Australian air traffic. The shift will be away from an ATFM system where, with the exception of Sydney Airport, demand and capacity is dynamically managed almost exclusively by ATC to a system where decisions to manage airport and airspace demand and capacity are taken in collaboration with stakeholders in a strategic pr pre-tactical time frame.

The major objectives of the CDM ATFM System are to initially identify demand/ capacity imbalances to a specific constraint, which may be an airport, runway or airspace volume, and then manage imbalances through proactive collaborative pre-tactical measures. If delay is required to address imbalances, such delay shall be planned delay and converted to ground delay rather than airborne delay.

Where delay is required to address demand/ capacity imbalances, the approach will be to implement ground delay through pre-tactical/ pre-departure control to enable flights to arrive at the destination airport, or transit specific airspace according to a pre-assigned slot time. This approach will:

- Reduce airborne delay and airline operational costs (cost of airborne delay greater than cost of ground delay)
- Reduce Co2 emissions
- Improve safety – delay taken by aircraft on the ground rather than in the air results in less airspace congestion and more predictable ATC workload
- Enable airline stakeholders to proactively plan and amend resource requirements according to the planned delay.

Actions taken to address demand/ capacity issues shall be known as TMI (Traffic Management Initiatives).

The CDM ATFM System will have the capability to model TMIs to ascertain the most efficient options to address any demand/ capacity issues. The TMI implemented will be as a consequence of collaborative decision making with relevant stakeholders. The effectiveness of any TMI implemented may be monitored in real-time to determine if adjustments are required. The overall effectiveness of any TMI may be reviewed through post operational reporting.

6.2. Modes of Operation

The CDM AFTM System will operate under three modes or phases for demand and capacity balancing:

- **Strategic** Demand and Capacity Balancing
- **Pre-Tactical** Demand and Capacity Balancing
- **Tactical** Demand and Capacity Balancing

Considering demand and capacity balancing in these three phases is in accordance with the ICAO Global ATM Operational Concept Doc.9854 which is supported by the ASTRA Strategic Plan.

Sections 6.2.1 to 6.2.3 provide further detail on these three modes/ phases of operation.

6.2.1. Strategic

6.2.1.1. Time Frame

From the time of publication of Airline schedules, for airport slot allocation purposes, currently seven months from day of operation, to two days prior to day of operation.

6.2.1.2. Services

The strategic services provided by the NOC will be published electronically for summer and winter cycle. The publication, a "Strategic Network Operations Plan" will forecast the effect on all scheduled operations of:

- Schedule demand at aerodromes.
- Known changes to aerodrome capacities
- Known military exercises and volumes affecting User Preferred Routes (UPR)
- Known facility outages
- Known Asia Pacific regional air traffic management issues
- Forecast traffic increases or decreases
- Known infrastructure changes such as Navaids
- Natural disaster issues.
- Significant events affecting Aviation Activity such as Air shows, and other major events

In addition to forecasting effects on operations, the Strategic Network Operations Plan will contain:

- A comprehensive list of Coordinated Routes (CR). CRs are agreed routes which may be utilised by Airline operators and ATCs to avoid forecast network obstacles such as weather or enroute traffic constrictions.
- Crisis management and business continuity plans covering:
    - Volcanic events
    - Pandemic events
    - Facility and resource events
    - Regional ATM business continuity events

The Strategic Network Operations Plan will be reviewed and updated every three months.

6.2.1.3. Strategic Collaboration

The NOC will collaborate with Airline Operators, Airports Owners, Military Authorities, regional ANSPs, government agencies and other stakeholders to develop the Strategic Network Operations Plan. Review and updating of the plan will be conducted by a working group of representatives drawn from collaborating entities.

ATC	TAS	Airline	Airport	Other	NOC
Provide: • Known system limitations • Expertise to develop CR, Contingency and crisis plans	**Provide:** • Plans relating to systems and facilities	**Provide:** • Forecast schedules based upon demand for all network schedule aerodromes	**Provide:** • Forecast airport capacities	**MIL Provide:** • Known military activities **Govt Agencies Provide:** • Known issues **Other ANSP:** • Known issues	**Provide:** • Anticipated aerodrome demand and capacity for planning • Contingency and Crisis management plans • Assimilated Strategic Network Operations Plan • Platform for plan review

6.2.2. Pre-Tactical

6.2.2.1. Time Frame

From two days prior to day of operation through flight plan submission to Start Clearance.

6.2.2.2. Services

The Pre-tactical services provided by the NOC will be published electronically each evening. The publication of a "Pre-Tactical Network Operations Plan" will be reviewed and updated tactically following extensive collaboration with CDM partners. It will include forecast effect on all scheduled operations by:

- Next-day schedule demand at aerodromes
- Next-day schedule demand in all ATC volumes.
- Flight planned operations
- ATC resources/capacity
- Forecast weather
- Updated changes to aerodrome capacities
- Military activities including FUA
- Known facility outages
- Known Asia Pacific regional air traffic management issues
- Natural disaster issues
- Significant events affecting Aviation Activity such as Air shows, and other major events

In addition to forecasting effects on next-day schedules, the Pre-tactical Network Operations Plan will publish AUSOTS and Flex tracks and additionally, those Coordinated Routes (CR) which may be utilised by Airline operators and ATCs to avoid forecast network obstacles such as weather or en-route traffic constrictions. Where natural disaster issues arise, then CRs will be collaboratively developed with ATC and Airline Operator to provide mutually agreeable solutions.

6.2.2.3. Pre-Tactical Collaboration

The NOC will collaborate with Airline Operators, Airports Owners, Military Authorities, international ANSPs, government agencies and other stakeholders to develop the Pre-Tactical Network Operations Plan. Review of the plan will be conducted by a working group of representatives drawn from CDM members.

ATC	TAS	Airline	Airport	Other	NOC
Provide: • Known ATC network capacity issues • Acceptance rates for aerodromes/ volumes • Approval of Flex Routes	**Provide:** • Known issues relating to facilities or systems	**Provide:** • Confirmed schedules	**Provide:** • Changes to day of operation facilities	**MIL Provide:** • FUA requirements **Met Provide:** • Forecast weather **Govt Agencies Provide:** • Known issues **Other ANSP:** • Known issues	**Provide:** • Assimilated Pre-Tactical Network Operations Plan • Platform for plan review
Response: Reviews plan	**Response:** Reviews plan	**Response:** Reviews plan	**Response:** Reviews plan	**Response:** Reviews plan	**Response:** Reviews plan regularly

6.2.3. Tactical

6.2.3.1. Time Frame

From two hours prior to flight until completion of flight operation

6.2.3.2. Services

The Tactical services provided by the NOC will be published electronically and updated regularly following extensive collaboration with CDM partners. It will include known effect on all scheduled operations by:

- Real-time demand at aerodromes.
- Flight planned operations
- Forecast and actual weather
- Real-time changes to aerodrome capacities
- Military activities including FUA

Tactical assistance will include proposed solutions to address real-time demand and capacity balancing issues through:

- Airspace volume management options
- Level-capping options (Level capping permits an aircraft to re-plan at a level below the TMI regulated airspace)
- Re-routing options
- Calculated Off Block Times (COBT) and/ or Calculated Take-off Times (CTOT)
- Real-time Asia Pacific regional air traffic management options
- Natural disaster management options
- Crisis and contingency management options

6.2.3.3. Tactical Collaboration

All changes which affect ATC or CDM members will be discussed at regular planning Telecons. Telecons will also be held on an ad-hoc basis with affected CDM members as required to discuss factors affecting existing plans.

Real-time traffic flight profile and take off time will be available to CDM members.

In seeking solutions to traffic demand and capacity balancing scenarios, ATFM will follow a hierarchical sequence of:

- ATM Resource management
- En-route spacing/delay scenarios
- Level capping scenarios
- Re-routing scenarios
- Ground delay scenarios
- Ground stop scenarios

CDM members will be consulted in evaluating the preferred options

Where possible, non-verbal methods of communication and data sharing will be utilised to minimise coordination and provide unambiguous information sharing.

The NOC will maintain web-based, real-time decision support tools for CDM members.

Decision support tools may comprise

- Aerodrome and airspace volume demand
- Aerodrome capacity and acceptance rates
- Aerodrome live information and status
- Event logs

Tactical Collaboration

ATC	TAS	Airline/ Aircraft	Airport	Other	NOC
Provide: • Amended aerodrome/ volume acceptance rates • Initiate requests for assistance to manage traffic through ground delay or ground stop and other initiatives • Relay requests for CTOT modification • Feedback on delivery of Network Operations Plan • Advice about 'un-forecast' events or conditions	**Provide:** • Known issues relating to facilities or systems	**Provide:** • Request for variation of departure time to NOC or ATC • Continuous real-time schedule information	**Provide:** • Information on airport operations restrictions.	**Met Provide:** • Amended Weather forecast **Mil Provide:** • Ad-Hoc requests for airspace activation **Govt Agencies Provide:** • Known issues **Other ANSP:** • Known issues	**Provide:** • Real-time traffic demand and capacity for aerodromes/ volumes • Briefings for un-forecast change to tactical plan • Regular Telecon briefings • Options to modify capacity to meet demand • Options to regulate demand to meet capacity when required.
Response: Reviews plan and responds to demand as required	**Response:** Reviews plan	**Response:** Reviews plan and modifies schedule and operations as required	**Response:** Reviews plan	**Response:** Reviews plan	**Response:** Reviews plan regularly

6.3. Proposed capabilities

Functional Requirements Documentation shall state the specific capabilities of the CDM AFTM System. As a high level definition, the CDM AFTM System shall have the capabilities defined in the following section .

6.3.1. Common Operational Picture

A common operational picture for all stakeholders to enable CDM and support the most efficient traffic management initiatives

6.3.2. Monitoring

Monitor current or predicted air traffic demand to a constrained airspace system resource, such as an airport or an airspace volume, including both published defined sectors of airspace or manually defined volumes of airspace

6.3.3. Identify Demand/ Capacity Imbalances

Identify resources and time periods when there is a substantial probability that predicted demand will exceed predicted capacity

6.3.4. Model

Model traffic demand strategically and tactically to align demand with capacity by adjusting departure times using initially a schedule based slot sequencing algorithm. Schedule information shall be updated by FPL (Flight Plan), Eurocat or ADS(B) information, whichever is the most recent source of data. Where no routine data is available, historic data shall be utilised.

6.3.5. Recommend

Recommend airspace resource capacities based on default system values or current operational configuration, such as runway configuration

6.3.6. Implement

Implement a TMI to allocate ground delay using slot allocations

Cancel or amend the parameters of the program

An ability to assign RTA (Required Time of Arrival) to a defined/ published fix or system defined point

Provide integrated airport arrival and departures by runway with tail tracking

Utilise gate-to-gate transit times (taxi-out, manoeuvring to departure fix, en-route/ trip/ transit, manoeuvring to arrival fix, taxi- in). These times to be varied dependent upon runway configuration and route flown. Where defined parameters are not available, the system shall use historic values for the aircraft type.

Enable CDM data exchange (between airlines, ATC, airports) through a system interface for slot allocations and airline operator target operation times, such as TOBT (Target

Off Block Time) or COBT (Programmed Departure Time), CTOT (Controlled Take Off Time) and CLDT (Controlled Landing Time).

An ability to assign RTA (Required Time of Arrival) to a defined/ published fix or system defined point

6.3.7. Review/ Reporting

Display statistics in real-time to provide an overview/ reporting on operational performance, airline and ATC compliance, and progress of the TMI

Decision support that automatically identifies unused system capacity and reallocates slots to utilise identified capacity

Provide post operational reporting to enable review of the efficiency of any TMI.

6.3.8. Airline Slot Swopping

Enable aircraft operators to substitute their flights between slots to enable an airline to manage their operations without impacting the NOC's objective of balancing demand and capacity

6.3.9. Flight Prioritisation

Enable Departure Tower and Flow Control to identify flights that are not compliant with COBT or CTOT to enable ATC to prioritise flights in accordance with originally assigned COBT or CTOT

6.4. CDM AFTM Members

Two distinct types of members/ users will be involved:

- Collaborative Decision Making Members (CDM Members), and
- Non-Collaborative Decision Making members (Non-CDM Members)

CDM Members shall share information as defined in Business Rules -ATFM SYSTEM (Business Rules) and shall be involved in the decision making process.

Non-CDM members shall send information and receive notice of decisions made.

CDM members may include but are not limited to:

- Major airlines, both Domestic and International
- Major airports where appropriate,
- Airservices
- Defence

All CDM members shall be signatories to the Business Rules

Non-CDM Members may include but are not limited to:

- Minor airlines and
- General Aviation

Any Airspace user with scheduled operations in Australian airspace may elect to become a CDM member. CDM Membership will require the member to be a signatory to the Business rules.

With the exception of flights originating at New Zealand airports, international long-haul flights into Australian airports will not be subject to ATFM SYSTEM ground delay and ground stop programs. The distance between departure airport and destination is sufficiently long as to render any controlled departure time management irrelevant.

Because of the short flying time between New Zealand and the East coast of Australia, flights departing New Zealand airports will where possible, be subject to ATFM SYSTEM management.

In general, international Airline Operators do not fly domestic airline sectors within Australia. International operators which operate domestic sectors and are capable of providing schedule information to ATFM SYSTEM shall be encouraged to become CDM Member airlines.

International airline operators departing Australian domestic airports shall be subject to TMI where the imbalance is airspace volume based.

6.4.1. CDM Members System Interface

The CDM ATFM System will be deployed into the Airservices Australia, National Operations Centre.

CDM members (Airline/Airport) will have access to the ATFM System to allow users to access all of the information contained within the CDM ATFM System. This will include displays of airport and airspace demand and capacity.

CDM members (ATC) will be provided with CDM ATFM System access from supervisor positions only. Individual ATC positions shall be provided with a display providing TMI information and CTOT/COBT times relevant specifically to their area of operation.

6.4.2. CDM ATFM Member Responsibilities

The CDM ATFM System will be capable of identifying demand and capacity imbalances.

CDM members will be responsible for:

- Ensuring that the system contains the most accurate information possible
- Determining the appropriate method for managing imbalance
- Managing aircraft in accordance with the agreed TMI.

Where a Ground Delay, Ground Stop, or Airspace Flow Program is chosen, CDM ATFM System automatically notifies CDM and Non-CDM members of the operating times/ actions to be taken to manage the imbalance.

CDM and Non-CDM members will be responsible for their own compliance with instructions disseminated by CDM ATFM System.

The definition of compliance shall be defined within the Business Rules.

CDM Member airlines will be responsible for using the system to identify and plan their additional fuel carriage requirements for traffic delays.

ATC shall be responsible for determining the need for implementation of a TMI following consultation with all CDM Members.

ATC shall be responsible for assisting airspace users to comply with the instructions issued by CDM ATFM System. This shall take the form of provision of Calculated Take off Times (CTOT) or Program Departure Times (COBT).

ATC shall de-prioritise aircraft which are non-compliant with a TMI, behind aircraft which are compliant with a TMI. And behind aircraft which are not subject to a TMI.

This prioritisation shall be applied to aircraft prior to departure from Class C and D airports and to aircraft being sequenced into an arrival stream at a destination airport. Prioritisation will not be applied during the departure phase from an un-controlled airport.

6.5. System Concepts

ATFM SYSTEM has many parts that work together to provide ATFM support to the controller. THE AFTM System Server/ Data Source will form a primary conduit of information and will be defined in Functional Requirements Documentation.

6.5.1. ATFM SYSTEM

The ATFM SYSTEM will provide the primary demand and capacity engine. The ATFM SYSTEM integrates data sources, builds a picture of demand and capacity and provides the CDM mechanism by which the demand can be managed. The ATFM SYSTEM will receive information from the following:

- OAG
- Airlines
- Airports
- ATC
- Defence ATC
- Flight Planning services/ Briefing services
- Surveillance Services (where available)
- Meteorological services

The ATFM SYSTEM will disseminate information to the following:

- Airlines
- Airports
- ATC
- Defence ATC
- Flight Planning services/ Briefing services

- Fight Information distribution service

All CDM Members will be provided with access to the ATFM SYSTEM. The system will have 2 basic levels of access capability.

All CDM Members will have the capability of:

- Displaying demand and capacity
- Displaying all known traffic within the system
- Modelling GDP, GS, and AFP TMIs
- Planning alternative methods of managing traffic imbalances

The ATC Client users within the Airservices NOC will have the additional capability of being able to implement a TMI.

6.5.2. AFTN

AFTN will provide the primary data source for ATFM SYSTEM Server to receive changes to Flight Plan messages and operating times for non-CDM members. Data submitted through existing Airservices interfaces such as NAIPS shall be disseminated by the AFTN System to the ATFM SYSTEM Server.

AFTN will provide an information dissemination source for ATFM SYSTEM Server to send changes to COBT and operating times to non-CDM members and CDM members utilising CADAS as an information source tool. Changes to COBT shall be sent via the AFTN in two specific formats: Slot Allocation Messages (SAM), and Slot Revision Messages (SRM). Data sent in this manner will be used primarily by ATC TWR units. Data collected from AFTN will be:

- FPL from external FIR,
- CHG, DLA, DEP, CNL, ARR
- Data Sent by AFTN will be
- SAM
- SRM
- SLC.

6.5.3. Surveillance Infrastructure

Surveillance information will provide the primary data source for ATFM SYSTEM for aircraft movement information. This data will be relayed and assimilated by a standardised system server as a component of ATFM SYSTEM.

Changes made to the ETD field of a FDR by ATC shall be reflected in ATFM SYSTEM as a request for a new PTOL. A new COBT shall be automatically generated by the system. This will allow voice requests through ATC for new COBT to be managed automatically.

- Flight Planning services/ Briefing services

6.5.4. ATFM SYSTEM Server

6.5.4.1. Pre loading of Information

The ATFM SYSTEM will be capable of storing Terminal Area Forecasts (TAF). Data obtained from TAF will be used by the system to generate a program model proposal in the ATFM SYSTEM Client for the National Operations Centre based upon stakeholder agreed parameters defined in the system for each airport.

A Traffic Management Specialist (TMS) will receive notification of a proposed program model proposal and in accordance with Business Rules:

- Publish the program
- Cancel the program
- Amend the parameters of the program.

6.5.5. ATFM SYSTEM Client

ATFM SYSTEM Client is the HMI interface to the ATFM Management side of the ATFM SYSTEM. Tools are provided in the ATFM SYSTEM client to provide a way of looking at various operational or traffic scenarios. The tools are used to analyse existing operations and previous days' events. Real-time and historical information can be accessed at the same time to compare current and previous TMI.

6.5.5.1. System Look-Ahead

The ATFM SYSTEM Client will be capable of displaying the demand and capacity of an airport or airspace model using schedule or OAG data, dependent upon the time period being modelled.

Each afternoon Airline CDM Members will update their schedule data for the following 48 hours.

6.5.5.2. Changes to Capacity

When it is assured that a change to airport or airspace volume capacity will occur and this is known more than 12 hours ahead, a TMI will be entered into the ATFM SYSTEM

This will afford CDM Members sufficient time to plan to manage the disruption.

All other changes to capacity for airports and airspace volumes requiring a TMI, will be subject to a planning Telecon between CDM Members prior to publication through the ATFM SYSTEM

This will afford CDM Members time to discuss and determine alternate means to manage the situation.

6.5.5.3. Program Types

When the arriving flight demand exceeds the Airport Acceptance Rate capacity, ATFM SYSTEM allows modelling of different scenarios in Ground Delay Tools (GDT) mode to help determine the most effective TMI. Dependent upon the situation, a Ground Delay Program, Ground Stop, or in some cases both may be necessary. Alternately, where

scenarios arise which restrict airspace capacity; an Airspace Flow Program might be more effective.

6.5.5.4. GDP (Ground Delay Program) or Ground Stop (GS) Program

To model a TMI, parameters must be selected for the airport to be managed. This is done through the ATFM SYSTEM Client window for the monitored airport in Ground Delay Tool (GDT) mode and selecting the GDP parameters. The parameters can be set in a variety of manners defined in Business Rules dependant on the program type selected:

6.5.5.4.1. GDP

There will be two methods of implementing a GDP. They are as follows:

Delay Assignment Schedule (DAS)

DAS assigns slots based upon Schedule data and does not specifically allocate slots to pop-up aircraft. This type of program suits airfields with few pop-up aircraft such as Sydney, Melbourne, or Brisbane.

General Arrival Program (GAP)

GAP assigns slots allowing specific gaps to be used by pop-up aircraft. This type of program suits airports with pop up traffic such as Perth, Adelaide, Cairns and Coolangatta

6.5.5.4.2. Ground Stop (GS)

Assigns a ground stop to all aircraft and does not assign a departure time. This is typically run during conditions of low visibility and un-forecast system contingencies such as a disabled aircraft on the runway. A GS program will usually transition back to full operation via a GDP.

6.5.5.4.3. Compression

This is a re-run of a program which seeks to fill unallocated slots. Over the course of a TMI, slots will become available as flights are cancelled or are unused. Functions within ATFM SYSTEM will identify unutilised capacity and permit a compression program to be run. Where compressions are run, airline retention of lost slots remains and these slots are re-offered to the "owner airlines" prior to release to other airspace users.

Creation of a program will include consideration of the number of aircraft that will be included in the program. Modelling of the program will permit a TMS to identify the appropriate program by selecting the aircraft to be included. This is based upon, departure airport and by departure ATC Group. This distinction by Group will permit the TMS to clearly target an issue with minimum disruption to network.

6.5.5.5. Airspace Flow Program (AFP)

Different parameters can be selected for an Airspace volume/s to be managed. An AFP is executed through the ATFM SYSTEM Client window for the monitored volume. The parameters can be set in a variety of manners defined in Business rules dependant on the program type selected. AFP shall be selected by Airspace volume, with traffic metering provided in the same mechanism as a GS or GDP but selecting individual or multiple ATC sector volumes as a component of the program instead of an airport.

6.5.6. ATFM SYSTEM Real-Time (RT)

ATFM SYSTEM-RT will generate ten different types of reports which may be redefined by users as required:

- Performance
- Flight Status
- Compliance (with CTOT or COBT)
- CTOT before POBT
- Cancels That Flew
- Pop-Ups
- Time Out Delay
- Duplicate Flights
- Events
- Unassigned Slots.

The system will also have the capability to provide user defined reports

These reports are updated every five minutes with the most current Aggregate Demand List (ADL) information. The information provided in these reports helps identify issues as they occur, so that they can be corrected before the issues that impact TMI performance.

The ATFM SYSTEM RT home page displays the status of individual events within a TMI.

The **Performance Report** shows whether the program is delivering the requested Program Rate. For each program hour, the report displays the program rate, number of slots, number of cancellations, extra demand, displaced demand, and the total demand expected. These counts are the key to understanding why the program is over or under delivering for a particular hour.

The **Flight Status** Report shows the current status of all program flights arriving within the program and any flight arriving outside of the program with a GDP control or GS control.

The **Compliance Report** shows all flights that did not comply with their assigned controlled time of departure regardless of whether they were controlled by a GS or GDP when they departed. A flight is considered "non-compliant" if it failed to depart within a specified "compliance window".

The **CTOT before POBT** Report shows all flights with a CTOT that is earlier than their Planned Off-Block Time (POBT) and have either not departed, or have departed and are non-compliant.

The **"Cancels that Flew"** report shows all controlled flights that were cancelled then operated without being reinstated via a FM, FZ, or FA message. A column shows the

most current cancellation reason. If a flight has multiple cancellation flags set, only one cancellation reason appears according to set precedence.

The **Pop-Up Report** shows all pop-ups arriving (or expected to arrive) during the program hours. For the purposes of this report, a pop-up flight is defined as any flight that does not have a SOBT/SIBT and did not appear in the ADL data at the time the initial program was modelled.

6.5.7. ATFM SYSTEM Post Operational (PO)

The ATFM SYSTEM PO reports provide a high level summary of the performance of Traffic Flow Management (TFM) initiatives. It is an analytical tool CDM Member use to assess the performance of ground delay programs (GDPs) the day after they occur. ATFM SYSTEM-PO generates reports and tables that help identify performance issues which eventually lead to the modifications of Airservices Australia procedures for implementing programs.

The purpose is to allow the CDM community to eliminate unnecessary delay by identifying and removing the causes of poor program performance.

ATFM SYSTEM PO information will be available to CDM members only, via a Web site. The data contained will represent the entire body of information on aircraft traffic movement and will allow CDM Members to access data when and where they require it without the need to rely upon Airservices to specifically generate individual reports.

ATFM SYSTEM PO shall generate a standard report containing all ATFM SYSTEM available detail currently required by DOITRDLG for individual airline reporting of On-Time performance at all ports. Information in this standard report will be airline specific and available only to the individual airline and their nominated delegates.

Reports will be available in HTML, text, and CSV/Comma delimited formats for manual or automated schedule downloading.

6.5.8. ATFM SYSTEM User Types

ATFM SYSTEM will comprise separate user types for ATC and Airline CDM members.

6.5.8.1. ATC

Each ATC role will have a dedicated page which will display and print out information relative to the user. Defence ATC will have the same information display as Airservices ATC.

ATC Line controller shall have access to details of traffic affected by TMI specifically for the individual volume or Airport they are managing. When ATC volumes are merged, then the details of traffic affected by TMI shall be capable of merging the information on the traffic from the separate volumes. CDM ATFM SYSTEM shall be capable of merging information along all existing volume merge paths and ad-hoc paths as determined operationally in real-time.

ATC Supervisors shall be able to view all ATC pages.

ATC Supervisors shall be able to use the CDM ATFM SYSTEM to apply for new COBT upon request from aircrew.

6.5.8.2. Airline CDM Member

Each Airline CDM Member role will have access which will allow information to be entered, displayed and printed out. The data contained shall be user specific. Airlines shall have access to details of all ATFM SYSTEM information relative to their airline operations. The airline will have the functionality to:

- Upload, amend and cancel schedules
- Swap or exchange aircraft operating times
- Reserve allocated PTOL for use by same airline operations
- Display TMI information.

6.5.9. ATFM SYSTEM Flight Planning/ Briefing Services interface

The ATFM SYSTEM Flight Planning services system interface is the primary interface for Non-CDM Members to enter or change data in the ATFM SYSTEM.

The interface shall provide the functionality to allow users to:

- Receive notification of existing TMI during FPL submission, and
- Nominate the preferred method of receipt of future or amended TMI information.

This interface will ensure that all users are provided with a minimum level of notification via their preferred data path.

Notification through the Flight Planning System of a TMI must also contain limited detail as to the reason for the TMI.

6.6. System Management and Roles

Management of the ATFM SYSTEM shall be conducted from the Airservices National Operations Centre.

Primary roles shall be System Administrators who will oversee the technical management of the ATFM SYSTEM and CDM Administrators who will oversee the application and management of the Business Rules. Connectivity with the ATFM SYSTEM shall be at three levels: Level 1, Level 2 and Level 3.

Level 1 Connections shall permit Airline CDM members to:

- Connect directly with the ATFM SYSTEM allowing information exchange to be conducted at a system level. Changes to schedule and operating information shall be communications directly to the ATFM SYSTEM from the airline system (AIRPAC, SABRE, GENEVA, etc).
- Connect directly with the ATFM SYSTEM allowing information to be viewed and modelled using the ATFM SYSTEM.
- Receive Aircraft movement and slot allocation messages via AFTN, the flight planning system, Email or SMS.

Level 2 Connections shall permit Airline CDM members to

- Connect directly with the ATFM SYSTEM allowing information to be exchanged.
- Connect directly with the ATFM SYSTEM allowing information to be viewed and modelled.
- Receive aircraft movement and slot allocation messages via AFTN, the flight planning system, Email or SMS.

Level 3 Connections shall permit Airspace users to:

- Receive aircraft movement and slot allocation messages via AFTN, the flight planning system, Email or SMS.

6.7. System Administrators

System Administrators from the context of external users shall be provided by Airservices Australia. They will have direct access to the ATFM SYSTEM.

They will be the primary point of contact for CDM member's technical requirements:

- System connection,
- Technical operation, and
- Degraded mode management

They shall coordinate and maintain the System access for users at the level defined in the Business rules.

Airline CDM members shall provide System Administration for their own internal users in coordination with Airservices Australia System Administrators.

System Administrators shall be responsible for System monitoring, maintenance, and data management.

System Administrators shall provide ATFM SYSTEM Technical System training to CDM members.

6.7.1. CDM Administrators

CDM Administrators shall be provided by Airservices Australia and located in the National Operations Centre in Canberra. They will be the primary point of contact for:

- CDM members Business Rules requirements:
- CDM coordination
- Compliance issues,

They shall coordinate and maintain the Business Rule set in consultation with all CDM Members.

System Administrators shall provide ATFM SYSTEM Operational system training to CDM members.

6.8. ATC AusFIC Environment (AusFIC)

Operational information shall be available within the AusFIC Briefing Office. Primary roles shall be Briefing Office Staff.

6.8.1. Briefing Office Staff

Briefing Office Staff will be operational users of the ATFM SYSTEM. They will have direct access to the AFTM System:

They shall be responsible for:

- Relay of ATFM SYSTEM information to airspace users upon request. This may include use of an automated service

6.9. ATC NOC Environment

Operational manipulation of the ATFM SYSTEM shall be lead from Airservices' National Operations Centre. Primary roles shall be National Operations Supervisors and Traffic Management Specialist.

6.9.1. Traffic Management Specialist (TMS)

TMS shall be operational users of the ATFM SYSTEM, located in the National Operations Centre in Canberra. They will have direct access to the AFTM System.

They shall be responsible for:

- Entry of airport and airspace capacity into the ATFM SYSTEM.
- Identification of demand and capacity balancing issues at airports and in airspace volumes.
- Initial consultation with ATC to determine the management options for demand and capacity issues.
- The technical modelling of a TMI
- Technical proposal of a TMI to CDM members
- Technical publication of a TMI to all users.

6.9.2. National Operations Supervisor (NOS)

NOS shall be operational users of the ATFM SYSTEM and located in the National Operations Centre in Canberra. They will have direct access to the AFTM System.

They will hold overall responsibility for the daily operation of the System and shall be involved in the coordination of any system downtimes.

The NOS shall hold operational command authority for the ATFM SYSTEM.

NOS shall initiate and chair telephone conferences (Telecon) involving all affected CDM members

NOS shall hold the authority to initiate the publication of a proposed and actual TMI following consultation with CDM members.

6.10. ATC Enroute Environment (ENR)

The ATC ENR is located in the two Airservices' Air Traffic Services Centres in Brisbane and Melbourne. For the purposes of the ATFM SYSTEM, these two centres will be considered a single environment.

Primary roles in the ATC ENR shall be ATC ENR Line Controllers, ATC Line Manager, and Flight Data Coordinator Support role.

6.10.1. ALM (ATC Line Manager)

- ALMs shall be operational users of the ATFM SYSTEM and have direct access to the system.

ALMs shall be responsible for:

- Monitoring the ATFM SYSTEM for demand and capacity issue within their areas of operational responsibility
- Notifying the NOC TMS when a demand and capacity issue requires management by a TMI.
- Ensuring that ATC ENR Line Controllers are provided with current COBT for aircraft departing from within their area of operational responsibility where web-based access to ATFM SYSTEM Web Client is not available.

6.10.2. ATC ENR Line Controller

ATC ENR Line Controllers shall be operational users of the ATFM SYSTEM and have direct access to the system.

ATC ENR Line Controllers shall be responsible for:

- Cross-checking COBT nominated by aircraft on first contact to ensure accuracy when the aircraft is departing from within the controller's area of operational responsibility.

6.10.3. ATC Flight Data Coordinator

- ATC Flight Data Coordinators shall be operational users of the ATFM SYSTEM and have direct access to the system.

ATC Flight Data Coordinators shall be responsible for:

- Ensuring that ATC ENR Line Controllers, ATC Terminal Line controllers and Flow controllers, are provided with current COBT for aircraft departing from within their area of operational responsibility..

6.11. ATC Tower Environment (TWR)

The ATC TWR environments are located at Airservices Class C and D towers, and Defence towers. In this document, Townsville, Darwin, Williamtown and are defined

below as Class C towers. Other Defence towers such as, Nowra, and Oakey are defined below as Class D towers.

For the purposes of the ATFM SYSTEM, these two types of towers, Class C and Class D will be considered separately to allow for the differing equipages.

Primary roles in the ATC TWR shall be Class C TWR Line Controllers, Class C TWR Shift Managers, and Class D Line Controllers.

6.11.1. Class C TWR Shift Manager

- Class C TWR Shift Managers shall be operational users of the ATFM SYSTEM and have direct access to the system

Class C TWR Shift Managers shall be responsible for:

- Monitoring the ATFM SYSTEM for demand and capacity issue within their areas of operational responsibility
- Notifying the ATC Terminal Shift Manager when a demand and capacity issue requires management by a TMI.

6.11.2. Class C TWR Line Controller

- Class C TWR Line Controllers shall be operational users of the ATFM SYSTEM and have direct access to the system

Class C TWR Line Controllers shall be responsible for:

- Cross-checking COBT nominated by aircraft on first contact to ensure accuracy when the aircraft is departing from within the controller's area of operational responsibility.
- Facilitating aircraft subject to TMI to achieve a CTOT.

6.11.3. Class D Line Controller

Class D TWR Line Controllers shall be operational users of the ATFM SYSTEM. They will have direct access to a:

- Display of Slot Allocation and Slot Revision messages.

Class D TWR Line Controllers shall be responsible for:

- Notifying the ATC Line Manager Controller when conditions may warrant the introduction of a TMI.
- Cross-checking COBT nominated by aircraft on first contact to ensure accuracy when the aircraft is departing from within the controller's area of operational responsibility.
- Facilitating aircraft subject to TMI to achieve a CTOT.

6.12. ATC Terminal Area/Terminal Control Unit (TMA/TCU)

The ATC Terminal Area environment is located within the two Airservices' Air Traffic Services Centres in Brisbane and Melbourne. ATC Terminal Control Units environment is located at the Airservices locations of Cairns, Sydney, Perth and Adelaide.

For the purposes of the ATFM SYSTEM, these two environments will be considered a single environment.

Primary roles in the ATC Terminal Area environment shall be ATC Terminal Shift Managers, ATC Terminal Line Controllers and ATC Terminal Flow Controllers.

6.12.1. ATC Terminal Shift Manager

ATC Terminal Shift Managers shall be operational users of the ATFM SYSTEM. They will have direct access to the AFTM System:

ATC Terminal Shift Managers shall be responsible for:

- Monitoring the ATFM SYSTEM Client for demand and capacity issue within their areas of operational responsibility
- Coordination with Class C TWR Shift Managers, and notification to NOC TMS when a demand and capacity issue requires management by a TMI.
- Ensuring that ATC Terminal Line controllers are provided with current COBT for aircraft departing from within their area of operational responsibility where access to ATFM SYSTEM is not available.
- Ensuring that ATC Terminal Flow controllers are provided with up to date information on aircraft compliance for use in decision making for the application of priorities in tactical flow management where access to the ATFM SYSTEM is not available.
- Coordination of updated COBT to ATC Terminal Line Controllers when a TMI is amended.

6.12.2. ATC Terminal Line Controller

ATC Terminal Line Controllers shall be operational users of the ATFM SYSTEM.

ATC Terminal Line Controllers shall be responsible for:

- Cross-checking COBT nominated by aircraft on first contact to ensure accuracy when the aircraft is departing from within the controller's area of operational responsibility.

6.12.3. ATC Terminal Flow Controller

ATC Terminal Flow Controllers shall be operational users of the ATFM SYSTEM.

ATC Terminal Flow Controllers shall be responsible for:

- Application of priority to aircraft complying with an ATFM SYSTEM TMI. This will entail manually de-prioritising non-compliant flights behind compliant flights. Aircraft, not subject to a TMI program will be afforded the same priority as a compliant flight.

6.13. Level 1 CDM Member Airline

Level 1 CDM Member Airline will have differing roles, dependent upon the method of connection and upon the specific requirements of the individual Airspace User. For the

purposes of ATFM SYSTEM this section describes the roles of the Level 1 fully connected airline. Primary roles in the Level 1 CDM Member Airline Operations Centre environment shall be the ATFM SYSTEM Technical Interface Role, the ATFM SYSTEM Network Management Role ATFM SYSTEM Flight Planning Role and Aircrew Role.

6.13.1. Level 1 Airline ATFM SYSTEM Technical Interface Role

An Airline ATFM SYSTEM Technical Interface role will be required to ensure technical operation and connectivity to the ATFM SYSTEM. The Airline ATFM SYSTEM Technical Interface role will not be an operational user of the system.

Responsibilities of the ATFM SYSTEM Technical interface role will be to:

- Ensure that the connection between the Airline Schedule Management System (AIRPAC, SABRE, GENEVA, etc) and ATFM SYSTEM operates correctly.
- Manage system outage and maintenance requests

6.13.2. Level 1 Airline ATFM SYSTEM Network Management Role

A Level 1 Airline ATFM SYSTEM Network Management Role will be an operational user of the system. They will have direct access to:

- ATFM SYSTEM
- Airline Network management software (AIRPAC, SABRE, GENEVA, etc)
- Flight Dispatch information and tools.
- The Flight planning system providing a display of COBT upon submission of a FPL.

Responsibilities of the ATFM SYSTEM Network Management Role will be to:

- Ensure automatic uploading of Schedule data to the ATFM SYSTEM is completed each day.
- Manage the Flight Planning function as it pertains the ATFM SYSTEM
- Ensure dynamic changes to schedule are updated to the ATFM SYSTEM as required.
- Managing the individual Airline COBT to ensure the most efficient operation of the network using the ATFM SYSTEM
- Ensuring COBT is passed to aircrew.

6.13.3. Level 1 Airline ATFM SYSTEM Flight Planning Role

A Level 1 Airline ATFM SYSTEM Flight Planning Role will be an operational user of the system. They will have direct access to:

- ATFM
- Airline Network management software (AIRPAC, SABRE, GENEVA, etc)
- Flight Dispatch information and tools.
- The flight planning system providing a display of COBT upon submission of a FPL.

Responsibilities of the ATFM SYSTEM Network Management Role will be to:

- Manage the Flight Planning function as it pertains the ATFM SYSTEM
- Ensure dynamic changes to schedule are updated to the ATFM SYSTEM as required.
- Managing the individual Airline COBT to ensure the most efficient operation of the network using the ATFM SYSTEM
- Ensuring COBT is passed to aircrew.

6.13.4. Level 1 Airline Aircrew

Level 1 Airline Aircrew Role will not be an operational user of the system. They will not have direct access to the ATFM SYSTEM.

Responsibilities of the Level 1 Airline Aircrew Role will be to:

- Operate an aircraft subject to a TMI at the times provided by the Level 1 Airline ATFM SYSTEM Network Manager and as updated by ATC
- Upon first contact with ATC, notify latest advised COBT

6.14. Level 2 CDM Member Airline Operations Centre

Level 2 CDM Member Airline will have differing roles, dependant upon the method of connection and upon the specific requirements of the individual Airspace User. For the purposes of ATFM SYSTEM this section describes the roles of the Level 2 airline. Primary roles in the Level 2 CDM Member Airline Operations Centre environment shall be the ATFM SYSTEM Network Management Role and Aircrew Role.

6.14.1. Level 2 Airline ATFM SYSTEM Network Management Role

A Level 2 Airline ATFM SYSTEM Network Management Role will be an operational user of the system. They will have direct access to:

- ATFM SYSTEM
- Airline Network management software (AIRPAC, SABRE, GENEVA, etc)
- Flight Dispatch information and tools.
- The flight planning system providing a display of COBT upon submission of a FPL

Responsibilities of the ATFM SYSTEM Network Management Role will be to:

- Ensure uploading of Schedule data to the ATFM SYSTEM is completed each day.
- Ensure dynamic changes to schedule are updated to the ATFM SYSTEM as required.
- Managing the individual Airline COBT to ensure the most efficient operation of the network
- Ensuring COBT is passed to aircrew.

6.14.2. Level 2 Airline Aircrew

Level 2 Airline Aircrew Role will not be an operational user of the system. They will not have direct access to the ATFM SYSTEM.

Responsibilities of the Level 3 Airline Aircrew Role will be to:

- Operate an aircraft subject to a TMI at the times provided by the Level 2 Airline ATFM SYSTEM Network Manager and as updated by ATC
- Upon first contact with ATC, notify latest advised COBT

6.15. Level 3 Airline Operations Centre

Level 3 Airline will have differing roles, dependent upon the method of connection and upon the specific requirements of the individual Airspace User. For the purposes of ATFM SYSTEM this section describes the roles of the Level 3 airline. Primary roles in the Level 3 Airline Operations Centre environment shall be the ATFM SYSTEM Network Management Role and Aircrew Role.

6.15.1. Level 3 Airline ATFM SYSTEM Network Management Role

A Level 3 Airline ATFM SYSTEM Network Management Role will be an operational user of the system. They will have direct access to:

- Flight Dispatch information and tools.
- The flight planning system providing display of COBT upon submission of a FPL

Responsibilities of the ATFM SYSTEM Network Management Role will be to:

- Receive COBT advised by the flight planning system and manage the individual Airline COBT to ensure the most efficient operation of the network
- Ensuring COBT is passed to aircrew.

6.15.2. Level 3 Airline Aircrew

Level 3 Airline Aircrew Role will not be an operational user of the system. They will not have direct access to the ATFM SYSTEM.

Responsibilities of the Level 3 Airline Aircrew Role will be to:

- Operate an aircraft subject to a TMI at the times provided by the Level 3 Airline ATFM SYSTEM Network Manager and as updated by ATC
- Upon first contact with ATC, notify latest advised COBT

6.16. GA user

For the purposes of ATFM SYSTEM a GA user will describe any airspace user not utilising a specific operations centre to manage air operations. Examples of GA Users will be charter operations, individual private pilots RFDS, and Aeromedical flights. This section describes the single role of the GA User.

GA User will not be an operational user of the system. They will have direct access to a flight planning system connection providing display of COBT upon submission of a FPL

Responsibilities GA User will be to:

- Receive COBT advised by the flight planning system or other nominated mechanism

- Check with the flight planning system or other nominated mechanisms to identify if they have been assigned a COBT within a nominated VSP of their latest advised COBT for changes
- Upon first contact with ATC, notify latest advised COBT
- Operate their aircraft if subject to a TMI, at the COBT or as updated by ATC.

Failure to submit a flight plan and/or check for a COBT may result in extensive airborne holding or no airways clearance being issued.

6.17. Stakeholders and personnel interfaces

The CDM ATFM Project will produce:

- CDM ATFM System displays for all CDM Members
  - Demand and capacity display,
  - TMI Modelling capability
  - CDM Member specific flight detail
  - CDM Member fleet manipulation capability
  - Notification of COBT, CTOT
  - Display filtering capability for specific users within the member organisations such as airport specific, gate specific, airspace volume specific. The filtering shall allow for views to be combined together as roles are merged.
- Integration with existing flight planning functions so that COBT notification is available directly at the flight planning stage to all aircraft operators.
- Display of real-time TMI activity available to aircraft operators.
- Telephone/SMS/email communication for the receipt of COBT by aircraft operators.
- Capability to send and receive data directly into CDM Member systems
- Real-time reporting of operations for all CDM Members
- Post Operational reporting of operations for all CDM Members
- Initial Technical Training for all CDM Member organisations
- Initial Operational Training for all CDM Member organisations.
- Coordination of information release to and via AIP

CDM members can choose to integrate to ATFM SYSTEM through direct connection in order to automate CDM messaging, as well as through additional plug-in programs, at their own expense.

Non-CDM members will not be provided with access to the CDM ATFM System. Information exchange with non-CDM members shall be via the flight planning system as well as AFTN, Email and SMS messaging.

7. Operational Scenarios

7.1. Scenario 1

Sydney Airport Weather Issue
The System is operating without any Air Traffic Flow Management initiative.

0000Z

The Sydney ATC Shift Manager receives a TAF for YSSY airport at 0000Z and identifies a weather condition that will reduce the Airport's capacity from the maximum available of 50 Arrivals/hour, down to a slower rate of 35 Arrival/hour. The rate reduction is forecast to occur at 0230Z

0005Z

The Sydney ATC Terminal Shift Manager contacts the NOC TMS to advise that the rate reduction will be required, with an expected time for return to normal rate.

The NOC TMS models the rate reduction in ATFM SYSTEM based on agreed business rules and presents the result to the NOC NOS as a proposed TMI. In this scenario, a Ground Delay Program (GDP) is chosen. The TMS selects appropriate parameters to build the GDP including the scope of affected airports and airspace volumes involved. In this scenario, all flights arriving at Sydney will be included, and the number of pop-ups (flights which may not yet have planned or scheduled at the time of creation of the program) to be included is 2/hour.

0010Z

The NOS initiates a Teleconference with all affected CDM members as identified by the ATFM SYSTEM program and sends a draft proposal of the TMI to all CDM members for review.

0030Z

At the teleconference, participating airlines and ATC support the proposed TMI

0040Z

The TMI is initiated and information is dispatched to CDM members and users in the following manner:

Level 1 Airlines

- COBT information and PTOL (Programmed Time Of Landing) information is sent directly to Airline Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
- ATFM SYSTEM displays TMI information through the cover sheet information page.
- ATFM System receives TMI information

ATFM SYSTEM displays TMI information including all COBT for CDM member aircraft together other airline specific information.
Slot allocation messages are dispatched via AFTN to CDM member airlines.

Level 2 Airlines

- ATFM SYSTEM displays TMI information
- ATFM SYSTEM receives TMI information.
- ATFM SYSTEM displays TMI information including all COBT for CDM member aircraft

Slot allocation messages are dispatched via AFTN to CDM member airlines

Level 3 Airlines

Slot allocation messages are dispatched via AFTN to airlines.
COBT information is sent to nominated Email and SMS destinations as identified during the FPL process through the flight planning system.

GA Users

COBT information is sent directly to aircrew via nominated Email and SMS destinations as identified during the FPL process through the flight planning system.

0045Z

Each user conducts process and coordination according to internal policy to manage the network demand and capacity issue and notify aircrew of the required operating times.

Level 1 Airlines will:

- Evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times

Level 2 Airlines will:

- Evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times.

Level 3 Airlines

Slot allocation messages are dispatched via AFTN to airlines. COBT information is sent to nominated Email and SMS destinations as identified during the FPL process through the flight planning system.

GA Users

COBT information is sent directly to aircrew via nominated Email, and SMS destinations as identified during the FPL process through the flight planning system.

ATC

- ATC Shift Managers will ensure that COBT and CTOT times are available to ATC Line controllers
- ATC Shift Managers and Line controllers with access to CADAS will cross check COBT and work to achieve CTOT times.

ATC Shift Managers with access to ATFM SYSTEM shall ensure that information on aircraft compliance is relayed to ATC Flow controllers, enabling them to apply appropriate priorities.

0050Z

The aircrew of VH-CCD submits a flight plan for a commercial charter between Gold Coast Airport and Sydney.

Upon entry of the flight plan information through NAIPS, the pilot is asked to provide one or more preferred methods of receiving a COBT in the event of traffic management instructions being issued for this flight. Options include Email, Facsimile, and SMS. The pilot inputs both an email address and a mobile number for SMS.

Upon final submission of the FPL, the pilot receives notification that the FPL has been accepted and that they will be affected by a TMI in place for Sydney airport. Details of the TMI are provided in the web based response. The pilot is provided with a COBT for their operation.

0100Z

The first aircraft to be effected by the TMI calls to taxi at Cairns airport for Sydney.

The aircrew of VOZ388 are aware of their COBT and call on Ground Frequency prior to that time for Airways Clearance.

The Cairns TWR Line Controller is aware of the COBT and CTOT which are written on the flight strip. He issues the Airways Clearance, via PDC appending the Clearance with the phrase "VOZ388, COBT 0213Z.

At 0213Z, the aircrew call for Taxi Clearance reading back COBT.

The TWR Line Controller cross-checks the COBT, processes the aircraft to the departure runway and endeavour to facilitate the departure as close to the CTOT as possible.

0150Z

The aircrew of VH-CCD calls to taxi at Gold Coast airport for Sydney and prior to their COBT, call for Airways Clearance. The Gold Coast TWR Line Controller is aware of the COBT and CTOT and issues the Airways Clearance, appending the Clearance with the phrase "VH-CCD, Program Departure Time 0213Z.

At 0205Z, the aircrew call for Taxi Clearance prior to the COBT. The TWR Line Controller processes the aircraft to the departure runway de-prioritising VH-CCD behind other aircraft with earlier COBT or CTOT.

0230Z

The ATC Sydney Terminal Shift Manager monitors the ATFM SYSTEM for the current status of all programmed flights arriving within the program and any flights arriving outside of the program with a GDP control.

Where access to ATFM SYSTEM , the ATC Terminal Shift Manager ensures that a list of arriving aircraft with the compliance status displayed is presented to the Flow controller for de-prioritisation of non-compliant flights behind compliant flights and non-regulated flights.

7.2. Scenario 2

Melbourne Airport Weather Issue
The System is operating without any Air Traffic Flow Management.

0000Z

The Melbourne ATC Terminal Shift Manager receives a TAF for Melbourne airport at 0000Z and identifies a wind shift condition that will preclude LAHSO, reducing the Airport's capacity from the maximum available of 42 Arrivals/hour, down to a slower rate of 24 Arrivals/hour. The rate reduction is forecast to occur at 0230Z

0005Z

The Melbourne ATC Terminal Shift Manager contacts the NOC TMS to advise that the rate reduction will be required, with an expected time for return to normal rate.

The NOC TMS models the rate reduction in ATFM SYSTEM based on agreed business rules and presents the result to the NOC NOS as a proposed TMI. In this scenario, a Ground Delay Program (GDP) is chosen. The TMS selects appropriate parameters to build the GDP including the scope of affected airports and airspace volumes involved. In this scenario, all flights arriving at Melbourne will be included, and the number of pop-ups (flights which may not yet have planned or scheduled at the time of creation of the program) to be included is 1/hour based on an historical understanding of the airport operation

0010Z

The NOS initiates a Teleconference with all affected CDM members as identified by the ATFM SYSTEM program and sends a draft proposal of the TMI to all CDM members for review.

0020Z

At the teleconference, participating airlines identify that delays to all flights into Melbourne will impose significant delays on flights departing Sydney, which has good weather and a high arrival rate. The CDM Members prefer that Sydney departures not be delayed to reduce the chance of gate congestion at Sydney. ATC supports the proposed amendment to the TMI.

This amendment is modelled and accepted during the teleconference.

0040Z

The amended TMI is initiated and information is dispatched to CDM members and users in the following manner:

Level 1 Airlines will:

- Evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times

Level 2 Airlines will:

- Will evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface

- Notify pilots of COBT times.

Level 3 airlines

Slot allocation messages are dispatched via AFTN to CDM member airlines. COBT information is sent to nominated Email and SMS destinations as identified during the FPL process through the flight planning system.

GA Users

COBT information is sent directly to aircrew via nominated Email, and SMS destinations as identified during the FPL process through the flight planning system.

0045Z

Each User conducts process and coordination according to internal policy to manage the network demand and capacity issue and notify aircrew of the required operating times.

Level 1 Airlines

- Will evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times.

Level 2 Airlines

- Will evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
  - Notify pilots of COBT times.

Level 3 airlines

Slot allocation messages are dispatched via AFTN to CDM member airlines

COBT information is sent to nominated Email and SMS destinations as identified during the FPL process through the flight planning system.

GA Users

COBT information is sent directly to aircrew via nominated Email, and SMS destinations as identified during the FPL process through the flight planning system.

ATC

ALMs with access to ATFM SYSTEM information relevant to their responsible operational area will pass COBT and CTOT times to ATC Line controllers for passage to aircraft on first contact

ALMs and Line controllers with access to CADAS will pass COBT and CTOT times to aircrew on first contact

ATC Shift Managers with access to ATFM SYSTEM shall relay information on aircraft compliance to ATC Flow controllers, enabling them to apply appropriate priorities.

0050Z

The aircrew of VH-PLU had submitted a flight plan for a commercial charter between Port Macquarie and Melbourne earlier in the day (2000L).

Upon entry of the flight plan information through the flight planning system, the pilot provided a mobile phone number to receive SMS messages.

The Pilot receives a message on his mobile phone "For VH-PLU YPMQ-YMML ETD 0200Z. Due WX at YMML; COBT 0215Z".

0150Z

QFA469, a CDM member aircraft is issued a PDC Clearance at Sydney airport for Melbourne.

The aircrew of are unaware of the TMI at Melbourne as it does not affect their flight. The Sydney TWR Line Controller is unaware TMI for Melbourne as no Sydney departing aircraft are affected.

At 0213Z, the aircrew call for Taxi Clearance.

The TWR Line Controller processes the aircraft to the departure runway and facilitates the departure with normal priority.

0150Z

QFA694, a CDM member aircraft is issued a PDC Clearance at Adelaide airport for Melbourne.

The aircrew of are aware of the COBT. The Adelaide TWR Line Controller is aware of the COBT and CTOT which are written on his flight strip. He issues the PDC Clearance, appending the text. "QFA694, COBT 0213Z".

At 0213Z, the aircrew call for Taxi Clearance and reads back the COBT

The TWR Line Controller cross-checks the COBT, processes the aircraft to the departure runway and endeavours to facilitate the departure as close to the CTOT as possible.

0212Z

The aircrew of VH-PLU calls ATC taxying at Port Macquarie airport for Melbourne. The aircrew reads back "COBT 0215Z". The Macquarie Line Controller cross-checks the COBT, issues the traffic statement and transponder code.

At 0215Z, the pilot reports departure and is issued an airways clearance to Melbourne.

0230Z

The ATC Melbourne Terminal Shift Manager monitors the ATFM SYSTEM for the current status of all programmed flights arriving within the program and any flights arriving outside of the program with a GDP control.

Where access to ATFM SYSTEM does not exist, the ATC Terminal Shift Manager ensures that a list of arriving aircraft with the compliance status displayed is presented to the Flow controller for de-prioritisation of non-compliant flights behind compliant flights and non-regulated flights.

7.3. Scenario 3

Hunter Airspace Volume Issue
The System is operating without any Air Traffic Flow Management.

0000Z

The ATC ENR Line Manager is monitoring the weather and receives an ARFOR for Area 20 forecasting Severe Convective Weather to pass through the airspace volumes for which he has responsibility. The weather is expected to arrive at 0400Z. He uses the ATFM SYSTEM Client to identify the number of aircraft intending to transit the affected volumes for the period of the forecast convective weather.

The ATC Line Manager consults the Business Rules for the affected airspace volume and identifies that the numbers of aircraft intending to transit will exceed the reduced capacity of the airspace with the convective weather.

0005Z

The ATC Line Manager contacts the NOC TMS to advise that a rate reduction will be required, with an expected time for return to normal rate. In consultation, the TMS and the Line Manager agree to propose a program which will allow flights with a destination of Sydney to

continue to operate unimpeded, but regulate all other flights planning to transit the volume.

The NOC TMS models the TMI in ATFM SYSTEM based on the agreed business rules as discussed with the ATC Line Manager, and presents the result to the NOC NOS as a proposed TMI.

In this scenario, an Airspace Flow Program (AFP) is chosen. The TMS selects appropriate parameters to build the AFP including the scope of affected airports and airspace volumes involved. All flights transiting the affected volumes of ARL and CNK will be included except for flights with a destination Sydney which will be excluded.

0010Z

The NOS initiates a Teleconference with all affected CDM members as identified by the ATFM SYSTEM program and sends a draft proposal of the TMI to all CDM members for review.

0020Z

At the teleconference, participating airlines and ATC support the proposed TMI

0040Z

The TMI is initiated and information is dispatched to CDM members and users in the following manner:

Level 1 Airlines will:

- Evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Will notify pilots of COBT times

Level 2 Airlines will:

- Will evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times.

Level 3 airlines

Slot allocation messages are dispatched via AFTN to CDM member airlines. COBT information is sent to nominated Email and SMS destinations as identified during the FPL process through the flight planning system.

GA Users

COBT information is sent directly to aircrew via nominated Email, and SMS destinations as identified during the FPL process through the flight planning system.

0045Z

Each User conducts process and coordination according to internal policy to manage the network demand and capacity issue and notify aircrew of the required operating times.

Level 1 Airlines will:

- Evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times.

Level 2 Airlines

Will evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:

- Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
- ATFM SYSTEM interface

- Notify pilots of COBT times.

Level 3 airlines

Slot allocation messages are dispatched via AFTN to CDM member airlines

COBT information is sent to nominated Email and SMS destinations as identified during the FPL process through the flight planning system.

GA Users

COBT information is sent directly to aircrew via nominated Email, and SMS destinations as identified during the FPL process through the flight planning system.

0050Z

The aircrew of VH-ABC had submitted a flight plan for a commercial charter between Maroochydore and Sydney earlier in the day (2000L).

Upon entry of the flight plan information through NAIPS, the pilot provided a mobile phone number to receive SMS messages

This aircraft will not be included in the TMI and no COBT information will be sent.

0200Z

Virgin Airlines Network operations identifies that the convective weather affecting the traffic between Brisbane and Sydney will have a significant impact upon the operations of VOZ2525 which has planned Brisbane for Hobart via the airspace now subject to a TMI. The aircraft cannot accept the ground delay and to arrive back in Gold Coast by the curfew. The Airline's flight dispatch department offers an amended route which will take the aircraft clear of the affected airspace routing via YBBN, LAV, ISKIM, PKS, WG, AY, ESL, LT, and YMHB. The route requires an extra 40nm but permits the aircraft to proceed without delay.

Virgin Flight Despatch resubmits a FPL via the amended route to avoid the COBT.

ATFM SYSTEM receives the amended FPL and VOZ2525 is removed from the TMI.

0400Z

The ATC Line Manager monitors the ATFM SYSTEM for the current status of all programmed flights arriving within the program and any flights arriving outside of the program with a GDP control.

0412Z

The aircrew of VH-PLU calls ATC taxying at Port Macquarie airport for Melbourne. The Macquarie Line Controller is aware of the COBT and issues the traffic statement and transponder code, appending statement with the phrase "VH-PLU, COBT 0430Z.

At 0430Z, the pilot reports departure and is issued an airways clearance to Melbourne.

0500Z

JST753, a CDM member aircraft is issued a PDC Clearance at Brisbane airport for Launceston. This flight has planned through airspace affected by the TMI.

The aircrew of are aware of the COBT. The Brisbane TWR Line Controller is aware of the COBT and CTOT which are written on his flight strip. He issues the PDC Clearance, appending the text. "JST753, COBT 0510Z".

At 0510Z, the aircrew call for Taxi Clearance.

The TWR Line Controller process the aircraft to the departure runway and endeavour to facilitate the departure as close to the CTOT as possible.

0500Z

VOZ2525, a CDM member aircraft is issued a PDC Clearance at Brisbane airport for Launceston. This flight has planned through airspace affected by the TMI.

The aircrew of are aware of the COBT. The Brisbane TWR Line Controller is aware of the COBT and CTOT which are written on his flight strip. He issues the PDC Clearance, appending the text. "JST753, COBT 0510Z".

At 0510Z, the aircrew call for Taxi Clearance.

The TWR Line Controller process the aircraft to the departure runway and endeavours to facilitate the departure as close to the CTOT as possible.

7.4. Scenario 4

Canberra Fog Issue
The System is operating without any Air Traffic Flow Management.

0530Z

The NOC TMS is monitoring the weather and receives a 0600 TAF for Canberra indicating a Fog at Canberra to commence from 1930Z until 2130Z. At 1200 the forecast is the same.

1200Z

The NOC BOM forecaster is consulted along with the ATC Terminal Shift Manager for Canberra.

Business Rules for the Canberra airport management indicate that the criteria are met for a Ground Stop (GS) program to be run at Canberra.

A GS program will issue a ground stop instruction to all affected aircraft planning to fly to Canberra during the period of the Fog.

The NOC TMS models the TMI in ATFM SYSTEM based on the agreed business rules. These business rules allow for the GS to transition into a Ground delay program, reducing the chance of demand peaking at the recommencement of operations.

1205Z

The NOS initiates a Teleconference with all affected CDM members as identified by the ATFM SYSTEM program and sends a draft proposal of the TMI to all CDM members for review.

1230Z

At the teleconference, participating airlines and ATC support the proposed TMI and the proposal to transition from GS to GDP at 2130Z

1240Z

The TMI is initiated and information is dispatched to CDM members and users in the following manner:

Level 1 Airlines will:

- Evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Will notify pilots of COBT times

Level 2 Airlines will:

- Will evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times.

Level 3 airlines

Slot allocation messages are dispatched via AFTN to CDM member airlines. COBT information is sent to nominated Email and SMS destinations as identified during the FPL process through the flight planning system.

GA Users

COBT information is sent directly to aircrew via nominated Email, and SMS destinations as identified during the FPL process through the flight planning system.

1240Z

Each User conducts process and coordination according to internal policy to manage the network demand and capacity issue and notify aircrew of the required operating times.

Level 1 Airlines will:

- Evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times.

Level 2 Airlines

- Will evaluate and manipulate the COBT and PTOL, exchanging PTOL and COBT between flights to achieve the minimum network disruption. Exchange will be conducted through the:
  - Schedule Management System (AIRPAC, SABRE, GENEVA, etc)
  - ATFM SYSTEM interface
- Notify pilots of COBT times.

Level 3 airlines

Slot allocation messages are dispatched via AFTN to CDM member airlines

COBT information is sent to nominated Email and SMS destinations as identified during the FPL process through NAIPS.

GA Users

COBT information is sent directly to aircrew via nominated Email, and SMS destinations as identified during the FPL process through the flight planning system.

ATC

ATC Shift Managers with access to ATFM SYSTEM information relevant to their responsible operational area will pass COBT and CTOT times to ATC Line controllers for passage to aircraft on first contact

ATC Shift Managers and Line controllers with access to CADAS will pass COBT and CTOT times to aircrew on first contact

ATC Shift Managers with access to ATFM SYSTEM shall relay information on aircraft compliance to ATC Flow controllers, enabling them to apply appropriate priorities.

1945Z

The aircrew of VH-ABC had submitted a flight plan for a commercial charter between Sydney and Canberra at 1900Z.

Upon entry of the flight plan information through the flight planning system, the pilot provided a mobile phone number to receive SMS messages

Upon receipt of the flight plan the pilot was advised that there was a GS in effect at Canberra for his arrival and that his COBT is expected to be 2140Z

2000Z

EAQ1234, a CDM member aircraft planned Sydney for Canberra calls Sydney Tower to check on the status of Canberra. Sydney Tower is aware that EAQ1234 has been issued a GS and that no further update has arrived.

The aircrew of EAQ1234 are advised of the COBT currently issued and the aircraft shuts down.

At 2030Z

The NOC forecaster in consultation with Canberra tower and other Met units identifies that the fog should lift earlier, by 2100Z.

THE NOC re-runs the GS and GDP with a new start up time.

The all CDM airlines are notified through ATFM SYSTEM and also verbally by phone.

The pilot of VH-ABC receives an amended COBT of 2120Z via his nominated method of SMS.

The Sydney TWR Line Controller is aware of the changes to COBT and CTOT which are updated on the ATFM SYSTEM, and are then written on his flight strip. Where a change in COBT is notified by the system, affected aircraft are notified of their amended times wherever possible.

The TWR Line Controller processes the aircraft to the departure runway and endeavour to facilitate the departure as close to the CTOT as possible.

The ATC Canberra Terminal Shift Manager monitors the ATFM SYSTEM for the current status of all programmed flights arriving within the program and any flights arriving outside of the program with a GDP control.

Where access to ATFM SYSTEM does not exist, the ATC Terminal Shift Manager ensures that a list of arriving aircraft with the compliance status displayed is presented to the Flow Controller (This role is undertaken by a Terminal Line Controller at Canberra) for de-

prioritisation of non-compliant flights behind compliant flights and non-regulated flights.

When the Operational Information System (OIS) is commissioned, the ATFM SYSTEM real time display window will be available directly to the Flow Controller.

7.5. Scenario 5

ATFM SYSTEM-Maestro integration

Where aircraft is subject to an ATFM SYSTEM GDP as a result of airport congestion and the destination airport has Maestro installed, then ATFM SYSTEM information will be integrated into Maestro in the following manner:

The ATC Terminal Shift Manager monitors the ATFM SYSTEM-RT "Flight Status Report" for the current status of all programmed flights arriving within the program and any flights arriving outside of the program with a GDP control.

Flights departing from ports more than 200nm from the destination will be managed by Maestro through the standard Maestro transition process: Unstable – Stable – Superstable - Frozen. The Flow controller shall manually de-prioritise non-compliant flights behind compliant flights. Aircraft, not subject to a TMI program will be afforded the same priority as a compliant flight.

Flights departing from ports less than 200nm from the destination will be managed through the "close" airport and "departure" airport functions, with COBT times entered into the Maestro system as notified by the ATFM SYSTEM_RT display

Once the aircraft are airborne, the Flow controller shall manually de-prioritise non-compliant flights behind compliant flights. Aircraft, not subject to a TMI program are non-regulated and are afforded the same priority as a compliant flight.

When the Operational Information System (OIS) is commissioned, the ATFM SYSTEM-RT window will be available directly to the Flow Controller.

7.6. Scenario 6

Level Capping and Lateral Re-routing.

Where aircraft is subject to an ATFM SYSTEM AFP as a result of Airspace Volume issues, an Airline shall be able to Flight plan clear of the airspace laterally and vertically. When a FPL is submitted which takes an aircraft outside the parameters of an issued TMI, the aircraft shall be automatically dropped from the program. When this occurs, the slot allocated shall be available for other aircraft to utilise. Where an airline chooses to release a slot in this manner, it may also retain the slot for use by another of its aircraft.

Lateral re-routing is described in Scenario 3.

Level capping permits an aircraft to re-plan at a level below the TMI regulated airspace.

In this scenario, VH KLX, a C650 has planned Port Macquarie (YPMQ) for Sydney (YSSY) at FL310. A TMI is in place for the high level sector above YPMQ. When notified by email that a TMI will require them to remain on the ground for 15 minutes, the aircrew elect to amend their FPL to remain below the affected airspace and then climb when clear.

The contact the Regional Briefing Office (RBO) and nominate the amended flight plan details.

The FPL is amended and ATFM SYSTEM removes the VH-KLX from the program.

The aircrew receive confirmation by SMS that they are no longer subject to a COBT. The aircrew calls ATC and proceeds as per normal.

7.7. Scenario 7

International Operator Integration

Where, international operators elect not to become CDM members, and they are subject to TMI, on a domestic sector or when outbound from a domestic port and are affected by an AFP, then ATFM SYSTEM shall issue a COBT for the aircraft via AFTN. ATC shall process as per any other airspace user.

7.8. Scenario 8

Compression or Revision of a program

The ATFM SYSTEM can revise programs and compress programs which have already been created.

A Program Revision is used when program parameters, such as Start or End time, Program Rate, or scope require modification. A Revision reallocates flights to slots based on the entered parameters and sends new COBT to flights arriving at the airport within the revision's time parameters. If the scope of a GDP is reduced, newly exempted flights still receive new COBT and are subject to departure compliance. This ensures that traffic levels are not in excess of the capacity at the end of the program time due to the cessation of regulation.

Where GDP parameters do not require modification, then either a Revision or Compression of a program can be considered.

Revision

If a GDP is not providing a sufficient reduction in traffic levels and/or there are multiple pop-up flights, then a Revision may be required.

A Revision captures the pop-up flights in the system and assigns them new slots based on the airport's capacity. A Revision can reduce or increase the average delay of the program depending on the airport's demand vs. capacity at the time of the Revision.

Compression

If a GDP is too restrictive, and there are a large number of cancelled or delayed flights with open slots ahead of operational flights ,a Compression could move the operational flights into the cancelled flights slots a Compression may be required

Compression moves operational flights into the slots left by cancelled flights, removing delay for the operational flights and reducing overall delay to all aircraft in the program.