

# OneSKY

AUSTRALIA

**Delivering a modern, resilient, safe and secure air traffic management service which unites both civil and military systems**

# OneSKY Australia

The OneSKY Australia Program is the most complex transformation of air traffic management in Australian aviation history, delivering over \$1.2 billion of economic benefits to airspace users.

A partnership between Airservices and the Department of Defence, OneSKY will replace the current independent civil and defence air traffic management systems with an advanced integrated system known as the Civil Military Air Traffic Management System (CMATS).

Together under OneSKY, Airservices and Defence will deliver more efficient air services, while supporting future air traffic growth and national security.

OneSKY will provide flexibility to all users of Australian airspace to allow more operational efficiency and resilience.

The OneSKY Program includes investment in critical air traffic infrastructure, facilities and services to enhance the safety, efficiency and capacity of the Australian air traffic network.



**2022**

Defence legacy system replacement commences and support system established.



**2023**

Defence and Airservices legacy system replaced.



**2024**

Full capability provided.

## Over \$1.2 billion in economic benefits

OneSKY will provide the capabilities required to accommodate growth in air traffic and the acceleration of technological advancements that the aviation industry is facing.

The Program will deliver more than \$1.2 billion of economic benefits to airspace users in Australia over 20 years.



### BUSINESS CONTINUITY

Uninterrupted service provision for all portions of Australian airspace, improving resilience for unplanned events and optimising use of resources.



### SHARED USE AIRSPACE

Providing greater access for all users to available airspace, enabling optimal use of airspace, better fuel planning, preferred routes and optimal flight levels.



### IMPROVED PRODUCTIVITY

Optimisation of how resources are deployed to ensure a sustainable workload. Achieved through improved decision support tools and dynamically redesigned airspace.



### TRAJECTORY BASED OPERATIONS

Airspace users can plan their arrival using a continuous descent from cruise to touchdown, enabling opportunity to decrease noise, save fuel and reduce carbon emissions.



### ROUTE OPTIMISATION

Airspace users can fly preferred routes to suit their needs.



## Next generation technology

Australia’s current air traffic control systems were ground-breaking technology when introduced in the 1990s and created significant advancements in civil and military air traffic operations at that time.

Both the civil air traffic control system (TAAATS) and the military air traffic control system (ADATS) are reaching end of life, presenting the opportunity to harmonise Australia’s civil and military air traffic management into one seamless system.

Airservices is delivering five technology initiatives under the OneSKY Program including design and delivery of the Civil Military Air Traffic Management System (CMATS), upgrade of the legacy voice communications system, the design of a Regional Tower Solution, enhancement of Defence air traffic control towers, and the integration of OneSKY into the National Airways System.

### Civil Military Air Traffic Management System

Delivered by Airservices in partnership with the Department of Defence, the new Civil Military Air Traffic Management System (CMATS) developed by Thales will replace the current independent civil and defence systems.

The investment in critical air traffic infrastructure, facilities and services will enhance the safety, efficiency and capacity of the Australian air traffic network.

The new system will be delivered in three releases as follows.

RELEASE ZERO	RELEASE ONE	RELEASE TWO
<p>.....</p> <p>The initial release includes mission systems deployed at defence sites in East Sale, Amberley, Tindal and Pearce. A support system will also be deployed at Amberley and at an Airservices facility in Melbourne.</p> <p>System Acceptance of Release Zero is scheduled for 2022.</p>	<p>.....</p> <p>The first major release for civil operations, Release One includes deployment of mission and support systems at Melbourne, Brisbane, Darwin, Townsville, Williamtown, Nowra, Perth, and Sydney. Release Zero sites will also be upgraded to Release One systems.</p> <p>System Acceptance of Release One is scheduled for 2023.</p>	<p>.....</p> <p>The final release will see all Australian sites upgraded to realise the full capability being delivered under OneSKY.</p> <p>This will establish a harmonised air traffic management system for all Australian airspace users.</p> <p>System Acceptance of Release Two is scheduled for 2024.</p>

## Voice Communications System

In 2019 Airservices replaced the legacy voice communications technology at Brisbane, Melbourne, Sydney and Perth with a Voice Over Internet Protocol (VOIP)-based system. This provides voice communications functions from existing TAAATS operator positions.

Through OneSKY, the Frequentis 3020X Voice Communications System installed will be upgraded to provide additional functions required for CMATS including inter-partitions communications, hotline over the V7 VOIP interface, secure voice, SATVOICE and other enhancements.

## Regional Tower Solution

Airservices will design and deliver an upgrade to the air traffic management system currently in use in regional towers. This involves leveraging the Saab Integrated Tower Automation Suite (INTAS) Tranche 2 solution currently used at major airport towers.

This technology will be adapted to meet the needs of regional aerodromes where traffic volumes and complexity do not justify a full implementation of INTAS Tranche 2.

## Airservices Defence OneSKY Tower (ADOT)

Airservices will leverage the OneSKY Regional Tower Solution to upgrade the air traffic management capability at four Australian Defence Force air traffic control towers (Edinburgh, Gingin, Richmond, and the Oakey Army Aviation Centre).

This will replace the legacy Australian Defence Air Traffic System (ADATS) technology to provide enhanced air traffic management where traffic volumes and complexity do not justify a full implementation of the Civil Military Air Traffic System (CMATS) solution.

## System Integration Modernisation Program

The System Integration Modernisation Program will enable the integration of OneSKY technologies into the National Airways System (NAS) and related Airservices Corporate Business Systems (CBS) by providing and upgrading interfaces from the NAS and CBS to Civil Military Air Traffic Management System (CMATS) sites.



## World-class infrastructure

OneSKY will deliver purpose-built Airservices buildings to house and support the Civil Military Air Traffic Management System (CMATS) and its associated operations room as Airservices transitions to the new system.

As the existing system must be maintained until CMATS is operational, a new building with independent systems ensures a seamless transition for airspace users, maintaining business resilience with uninterrupted service provision.



### CMATS Air Traffic Services Centre

Purpose-built Civil Military Air Traffic Management System (CMATS) Air Traffic Services Centres (ATSC) will be constructed to house the operations room, equipment rooms, service rooms, showers, sleep rooms, locker rooms and Air Traffic Control support areas.

Power to the ATSCs is delivered by a separate Building Services Centre which includes four generators, uninterrupted power supply and associated switchboards to provide the required level of redundancy.

The decommissioning and removal of the existing air traffic management system (TAAATS) will also require refurbishment of existing TAAATS operations rooms and upstairs office spaces.

## Training Support Facilities

The training support facilities include the CMATS Pseudo Pilots Rooms, Operational Simulator and Training Systems (OSTS), Ab Initio Simulator and Training System (ASTS) and Part Task Trainers used for skill-specific training.

Located at each CMATS Operational Centre, the OSTS will support the initial and ongoing training of air traffic controllers and provides the business continuity function, while the Pseudo Pilots Rooms will accommodate the Pseudo Pilot consoles which simulate air traffic control training scenarios on the OSTS consoles.

Located in Melbourne, the ASTS will support initial entry training.

## Joint Software Support Facility

Located in Melbourne, the Joint Software Support Facility (JSSF) will provide a range of support functions for the Civil Military Air Traffic Management System (CMATS) including test and evaluation, data adaptation, final verification and installation.

## Support Platform Space

The Support Platform Space (SPS) will provide a range of support functions for CMATS including Thales software support, fault investigation and software development.

The SPS will be co-located with the Joint Software Support Facility on the ground floor of the Melbourne ATSC to provide immediate customer support. These facilities will include the Air Traffic Management Support Group as well as Air Traffic Control, Defence and Contractor support engineers.

## Joint Secure Facility

Located within the Brisbane Control Tower Complex, the Joint Secure Facility will provide a secure operating facility to deliver Defence Darwin and Townsville approach services (Secure Mode Operations) and National Airspace Management Operations (NAMO).

Provision of this secure operating environment will require addition of a secure equipment area within the Brisbane OneSKY Equipment Room to support the Defence secure equipment.

## Technical Operations Centres

Located on the ground floor of the Brisbane and Melbourne Air Traffic Services Centres, the Technical Operations Centre (TOC) provides system monitoring, system administration and fault reporting management; system recovery using control and monitoring tools; configuration changes and preventive maintenance actions to restore system functionality.

## OneSKY Equipment Rooms

The OneSKY Equipment Rooms (OER) are dedicated equipment areas to house CMATS operational equipment.

New buildings will house the Melbourne and Brisbane OER. The Perth OER will be a partial build within the existing Air Traffic Services Centre building.

## Customer Training Area

Delivered by Thales, the Customer Training Area (CTA) is a refurbished area located within the Thales World Trade Centre in Melbourne.

Thales will use this facility to provide CMATS training to both Airservices and Defence personnel.

The CTA supports the training element of the Contractor System Verification Facility.

## Contractor System Verification Facility

The Contractor System Verification Facility (CSVF) houses the training, integration, and testing tools to support CMATS development.

A temporary facility located within the Melbourne airport precinct, the CSVF is an important part of verifying CMATS capability in a simulated air traffic control environment as development of the system progresses.

## Melbourne Canteen

The Melbourne Canteen is a purpose built and serviced staff canteen to be housed at the Airservices Melbourne Centre.

Relocation of the Melbourne Canteen from the Air Traffic Services Centre makes room for a new CMATS Ab Initio System Training Simulator.





## Enabling the Benefits

Airservices is introducing initiatives to ensure the people and processes are in place for Airservices customers to get the most benefit from the new capabilities that CMATS will deliver.

These fall within three key strategic air traffic management transformation goals; Centralised Collaborative Command and Control, Broad Utilisation of Workforce and Optimised Network and Flight Efficiency.

### Centralised Collaborative Command and Control

A national approach to the oversight and operation of Australian airspace for both military and civil use. Airservices will enable the ability to coordinate a national response to unplanned events and optimise deployment of our resources.



#### **NATIONAL OPERATIONS MANAGEMENT CENTRE**

The National Operations Management Centre will be a central entity in the Airservices Air Traffic Management (ATM) architecture providing planning, oversight and operational authority of Australian airspace.

This will remove duplication of effort, provide a standardised service Australia-wide, increase contingency capability, enable Continuous Descent Operations and provide a single national point of contact for all ATM enquiries.



#### **NATIONAL AIRSPACE MANAGEMENT OFFICE**

The National Airspace Management Office (NAMO) will be a collaborative military and civilian capability providing a Shared Use Airspace management service to all Australian airspace users.

It will provide increased notification and more flexibility in flight plan options through a less restrictive airspace construct to better manage traffic volumes for military and civilian operations.



#### **NATIONAL OPERATIONS DISRUPTION RESPONSE CAPABILITY**

The National Operations Disruption Response Capability (NODRC) will support uninterrupted service provision for Australian airspace, improving resilience for unplanned events and optimising use of resources.

When combined with Dynamic Sectorisation, Endorsement Modernisation, the National Operations Management Centre and the CMATS Air Traffic Services Centres, this capability will enable an expedited return to service after an air traffic services contingency event.

## Broad Utilisation of Workforce

Airservices will introduce flexibility for air traffic controllers to move easily between positions, geographical areas and work groups.

Advanced technology and real-time predictions tools will support decisions while modern tools and processes will reduce the administrative workload. Greater access to air navigation data will also enhance the ability to plan the most effective and safe flight route on any given day or night.



### ENDORSEMENT MODERNISATION

A modern endorsement framework will be introduced to provide air traffic controllers with the skills and knowledge required to operate in a dynamically managed airspace where airspace users are operating on User Preferred Routes.



### DYNAMIC SECTORISATION

Dynamic Sectorisation will be a flexible sector model where airspace can be modified in alignment with the predicted short term traffic forecast.

Airspace users currently operate on fixed routes with static airspace sectors designed around those fixed routes. As air traffic grows, introduction of User Preferred Routes will require Airservices to dynamically move airspace to meet the way aircraft are flying on that day or night.

Dynamic Sectorisation will enable equal distribution of controller workload and flexible use of resources in response to customer operational needs.



### DIGITAL AERONAUTICAL INFORMATION PLATFORM

A digital collection of aviation documents and forms accessible by users internal to Airservices will be delivered via standard computers, tablets and the web browser embedded into the CMATS console.

This will enhance collaboration and flexibly to respond to immediate changes in the Air Traffic Management environment while reducing costs incurred by maintaining paper documents, lists and forms.



### **DECISION SUPPORT TOOL: TASK LOAD**

As growth in air traffic rises, the introduction of Decision Support Tools will provide air traffic controllers with the advanced technologies needed to ensure a sustainable workload in dynamically redesigned airspace.

The Task Load Decision Support Tool will provide timely indication of forecast task load so supervisors can make proactive decisions on when to split sectors or provide additional support.

It will also analyse historical data to assist in the determination of the dynamic sector plan in the pre-tactical space and subsequent analysis of the outcome of the plan in the post-operations space.



### **CMATS AIR TRAFFIC SERVICES CENTRE**

CMATS Air Traffic Services Centres will be operations focussed, housing front-line air traffic controllers, their immediate supervisors and a local system supervisor.

Support functionalities will be located in the National Operations Management Centre (NOMC). This will remove duplication of effort, provide a standardised service Australia-wide, increase contingency capability and enable Continuous Descent Operations.



### **PRE-SHIFT BREFING**

Air traffic controllers will be individually briefed on the area they will be controlling during their shift using the new Digital Aeronautical Information Platform.

The introduction of Dynamic Sectorisation will retain the requirement for controllers to be briefed on the national picture, however group controller briefings will be moved into a dedicated room to reduce noise in operational areas.



## Optimised Network and Flight Efficiency

A less restrictive airspace construct will enable better management of traffic volumes for both military and civilian operations. This will enable optimisation of air traffic flow, including maximising use of runways to reduce travel delays.

Greater access to air navigation data will also enhance the ability to plan the most effective and safe flight route on any given day.



### **SINGLE FLIGHT DATA REGION**

Management of Australian airspace will be consolidated into a single Flight Data Region (FDRG), creating a more collaborative air traffic management environment which can accommodate an increase in air traffic.

Additionally the Flight Information Regions (FIR) of YMMM and YBBB will be combined into a single FIR. During CMATS transition there will be three FDRGs when all three Air Traffic Systems are active.



### **WAKE TURBULENCE MANAGEMENT**

Wake Turbulence Management will provide new separation standards using the aircraft category instead of the basic weight category.

This will create a more efficient arrival sequence and provide alerts to the air traffic controller on imminent loss of separation between pairs of aircraft in the arrivals phase.



### **USER PREFERRED ROUTES**

**AND**

### **DYNAMIC AIRBORNE REROUTE PROCEDURE EXPANSION**

User Preferred Routes (UPR) will enable airspace users to fly preferred routes to suit their needs.

Airservices will establish two types of airspace, UPR airspace and Non-UPR airspace. In UPR airspace airlines will have the option to operate UPRs and use an expanded Dynamic Airborne Reroute Procedure. Non-UPR airspace will only be serviced by fixed routes.

UPR airspace will cover the whole of the Australian Administered Airspace, with Non-UPR areas being established to provide systematic protections in areas of high complexity or high traffic levels, active only during the periods when the protection is required.



### DECISION SUPPORT TOOL: SEPARATION

As air traffic increases, introduction of Decision Support Tools will provide air traffic controllers with the advanced technologies needed to ensure a sustainable workload in dynamically redesigned airspace.

The Separation Decision Support Tool will replace the current conflict detection tool for planning (Flight Plan Safety Net Alert) with a Long Term Conflict Detection Tool. This uses flight plan data to provide conflict detection with other flight plans and restricted airspace.

Additionally, Medium Term Conflict Detection will use trajectory based information to provide a higher fidelity conflict detection with other aircraft in restricted airspace.



### CONTINUOUS DESCENT OPERATIONS

A process will be introduced whereby the descent sequence can be established prior to the top of descent. This will allow for uninterrupted (no controller intervention) idle cruise descent into capital city aerodromes.

This Continuous Descent Operations ability will enable optimisation of air traffic flow including maximising use of runways and reducing travel delays. This will also provide airspace users with the ability to decrease descent noise, save fuel and reduce carbon emissions.



### DIGITAL AERONAUTICAL INFORMATION PLATFORM

A digital collection of aviation documents and forms accessible by users internal to Airservices will be provided via standard computers, tablets and the web browser embedded into the CMATS console.

This will enhance collaboration and flexibly to respond to immediate changes in the Air Traffic Management environment while reducing costs incurred by maintaining paper documents, lists and forms.



### DYNAMIC SECTORISATION

Dynamic Sectorisation will be a flexible sector model where airspace can be modified in alignment with the predicted short term traffic forecast.

Airspace users currently operate on fixed routes with static airspace sectors designed around those fixed routes. As air traffic grows, introduction of User Preferred Routes will require Airservices to dynamically move airspace to meet the way aircraft are flying on that day or night.

Dynamic Sectorisation will enable equal distribution of controller workload and flexible use of resources in response to customer operational needs.

