Air Traffic Management
Policy Directions

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Executive Summary


The White Paper provided an overview of aviation infrastructure and technology policy directions and a number of short, medium and long term air traffic management initiatives. The Government indicated that after considering any industry and public comment on these initiatives it would finalise Air Traffic Management (ATM) policy directions.

This document identifies five key Government policy directions for Australia’s national air traffic management system in order to meet the White Paper’s clearly articulated goals of enhanced safety, improved environmental performance, increased efficiency and meeting future air traffic demands. These policy directions are: robust and integrated planning, adoption of advanced technology, international harmonisation, enhanced regional aviation safety and managing environmental impacts.

This document sets out Australia’s governance arrangements for the delivery of ATM in Australia and the roles of the Civil Aviation Safety Authority (CASA), Airservices Australia (Airservices), the Department of Defence, the Department of Infrastructure and Transport and the aviation industry.

By setting its policy directions, the Government provides a clear platform for future coordinated Government agency planning, investment by ATM service providers and standards development by the safety regulator, as well as assisting forward planning and investment by the aviation industry. Such planning must also take into account the importance of international and regional harmonisation in air traffic management.

In response to these policy directions, CASA is finalising an ATM regulatory plan which outlines its proposed future ATM regulatory and standards requirements – including timings and mandates where appropriate, for the implementation of modern technologies (equipment and procedures). CASA will also outline the standards and regulatory development processes it will be adopting to finalise these future requirements.

CASA’s plan details how future requirements will impact on different sectors of the aviation industry - from major airlines to recreational aviation users - and provides for a safe and responsible transition to changes in future air traffic arrangements.

Airservices, as the major civil air traffic service provider, in conjunction with the Department of Defence, will finalise a national ATM services and facilities plan.

This plan will implement the Government’s key policy directions, aligns with CASA’s regulatory settings and outlines Airservices future planned investment in infrastructure, equipment and personnel skills and training to support industry transition to the future air traffic system environment.
Together these Government agency plans provide an integrated approach to future air traffic management planning in Australia and will be coordinated through the Aviation Policy Group, with the opportunity for public and industry comment before they are finalised. They will also assist the Australian Strategic Air Traffic Management Group (ASTRA) in their future examination of the industry ATM Plan.

These integrated agency plans will also enable industry to align their future communications and navigational equipment, personnel and operational plans with future regulatory and air traffic surveillance requirements.

The relationship between the key ATM policy and planning documents is illustrated in the diagram below.

![Diagram of ATM policy and planning documents]

Above all, aviation safety is paramount and must be at the forefront of future ATM planning and development.

Specific proposals that would change Australia’s ATM system should be developed by the responsible government aviation agencies in consultation with industry. There must also be effective community consultation on significant air traffic management proposals that would impact on existing noise management arrangements. ATM initiatives can potentially secure improved environmental outcomes for communities affected by aircraft operations.

Air traffic management by its very nature is continually evolving. The Australian ATM Policy Directions will be reviewed at least every three years to reflect new developments and changes in Australian and international aviation regulations, services and aircraft operations.
1. Background

1.1 What is Air Traffic Management (ATM)?

Air Traffic Management (ATM) is defined by the International Civil Aviation Organization (ICAO) as the “dynamic, integrated management of air traffic and airspace — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties”.

Australia’s ATM system incorporates airspace regulation and management, communications, navigation and surveillance facilities and air traffic services standards and procedures. The Government recognises the important role technology, people and training plays in the development of a safe and efficient ATM system.

The Australian Air Traffic Management System includes:

- air traffic safety regulation, which includes airspace regulation by the Office of Airspace Regulation (OAR) in the Civil Aviation Safety Authority (CASA);
- air traffic surveillance, which is undertaken by Airservices Australia (Airservices) and by the Department of Defence, through the Royal Australian Air Force (RAAF), at certain airports where there are both civilian and Defence operations; and
- aircraft communications and navigation, which is undertaken by a range of aircraft operators on instruction from the service provider in controlled airspace and in compliance with CASA requirements in non-controlled airspace.

As a signatory to the Convention on International Civil Aviation (the Chicago Convention) the development of Australia’s ATM system will be consistent with ICAO Standards and Recommended Practices (SARPs).

ICAO continues to support the effective coordination of global ATM implementation activities leading to the realisation of a seamless global ATM system. Australia will continue to work with ICAO to promote seamless international air traffic services aimed at providing better safety, efficiency and environmental outcomes.

1.2 Australian Context/Challenges

Industry Growth

Despite a series of market challenges over the past decade including the collapse of Ansett, major security events, several international health events and most recently the global financial crisis, the Australian aviation industry has shown remarkable resilience and continued to grow.

There have also been changes in market composition including the entry of low-cost carriers such as Jetstar, Virgin Blue and Tiger Airways, the growing emergence of international carriers from the Middle East, and strong growth in regional markets including coastal destinations on the east coast and to mining and energy gateways in the north-west of Western Australia.
The Australian aviation industry is expected to continue to grow in the short and long-term. The number of air passenger movements through the capital city airports is forecast to increase by 4.2 per cent a year from 2008-09 to 235 million in 2029-30.\(^1\) In 2010-11, there were 109 million air passenger movements through the capital city airports\(^2\).

The number of aircraft movements through capital city airports is expected to increase by 2.2 per cent a year from 2008-09 to 1.7 million in 2029-30, an overall increase of around 60 per cent\(^3\). In 2010-11, there were 0.9 million aircraft movements through capital city airports\(^4\).

While not facing the level of congestion forecast to occur in European and North American airspace, the highest levels of aviation growth are forecast to occur in the Asia Pacific region. Australian aviation growth requires proactive planning and investment in our air traffic management system to meet future demand. This approach will enhance the safety of the system and provide increased capacity in dealing with higher levels of traffic in our airspace, which covers eleven percent of the world’s airspace.

Governments, aviation agencies and industry also need to work together to examine options for addressing the future demand for increasing aviation capacity. For example, the Australian and New South Wales Governments are currently working together on a joint study on aviation capacity for the Sydney region. The Study is examining the short, medium and longer term aviation infrastructure requirements for the Sydney region and the capacity of the existing aviation infrastructure and land transport network linkages to meet future demand in the passenger, freight and general aviation sectors.

**Regional Aviation**
Aviation plays a critical role in connecting our regional communities to the rest of Australia and overseas and in the delivery of essential services. In recent years, a number of regional airports have experienced considerable growth putting pressure on the provision of local ATM services and facilities.

This regional aviation growth is reflected in the figures – passenger movements through non-capital city airports continued to rise from 19.8 million in 2005-06 to 26.2 million in 2010-11, representing an average growth rate of 5.7 per cent\(^5\).

The Australian Government has recognised the importance of regional aviation in the Australian Airspace Policy Statement. One of the three specific airspace policy objectives of the Government is enhanced ATM services at regional aerodromes regularly served by passenger transport services as determined by CASA.

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\(^1\) Bureau of Infrastructure, Transport and Regional Economics (BITRE), Aircraft movements through capital city airports, Research Report 117, December 2009.

\(^2\) Actual figures for 2010-11, BITRE.

\(^3\) BITRE, Aircraft movements through capital city airports, Research Report 117, December 2009.

\(^4\) Actual figures for 2010-11, BITRE.

\(^5\) Actual Figures, BITRE.
Cooperating with Neighbouring States

International air traffic arriving and departing Australia traverses neighbouring flight information regions (FIRs) of Auckland Oceanic, Colombo, Honiara, Jakarta, Johannesburg Oceanic, Ujung Padang, Male, Mauritius, Nadi and Port Moresby. Effective cooperation between Australia and other aviation administrations is essential in realising the vision of seamless air traffic services provision and cross border aviation safety and efficiency. Close cooperation with Australia’s neighbours is important to ensure that the development of national ATM systems does not diverge. Australia will continue to contribute to aviation safety and ATM policy discussions and collaboration with our neighbours in the region.

Currently, Australia contributes to aviation safety outcomes in Indonesia and Papua New Guinea through capacity building activities. Australia is committed to extending existing and developing new activities, to achieve greater interoperability in the future ATM systems and advancements with our neighbours in the Asia Pacific. The Government expects Airservices and CASA to continue to support the Australian Government’s aviation safety initiatives in the Asia Pacific region.

2. Roles and Responsibilities of Government Agencies and Industry

The Government considers it important to clearly outline the role and governance arrangements of government agencies involved in delivering a safe and efficient ATM system.

Accordingly, in 2009 the Government established a five member expert Board to provide strategic direction to CASA with a particular focus on governance.

In 2009, the Government also established the Australian Transport Safety Bureau (ATSB) Commission. The Commission is responsible for governing the functions of the Transport Safety Investigation Act 2003.

The Government has confirmed the independence of the ATSB by establishing it as a distinct statutory authority under the Infrastructure and Transport portfolio.

The Australian Government will ensure governing legislation and regulations will be updated, if required, to adopt international developments and best practice which need to be reflected in Australia’s ATM system. Our governance mechanisms will also facilitate continuity, accountability and delivery of new ATM practices and procedures by Airservices, CASA and the aviation industry.

The Minister for Infrastructure and Transport will continue to provide strategic direction to Airservices, CASA and the ATSB through the provision of updated Statements of Expectations for each organisation.

The Australian Government will also continue to update the Australian Airspace Policy Statement following the review provisions set out in Section 10 of the Airspace Act 2007.
2.1 Airservices Australia (Airservices)

The functions of Airservices are outlined in the *Air Services Act 1995* and *Air Services Regulations 1995*.

The Government, through the Minister for Infrastructure and Transport, also outlines its priorities for Airservices in a publicly available Statement of Expectations. The Government’s vision for Airservices is that it efficiently and effectively performs its statutory functions to deliver safe, high quality air navigation and related services to the benefit of the Australian community.

The Government expects that Airservices must regard the safety of air navigation as the most important consideration in performing its functions and to focus on delivering core air traffic management and aerodrome rescue and fire fighting services.

Airservices is required to perform its functions in a manner that supports Government policy, specifically the following three key aviation goals in the National Aviation Policy White Paper:

- safety remains the highest priority;
- a responsible approach to managing the environmental impacts of aviation; and
- a coordinated approach to airport planning and investment.

Two other important aspects of the Statement of Expectations relevant to ATM include:

- continued implementation of a number of agreed joint civil and military aviation harmonisation initiatives in conjunction with the Department of Defence; and
- continued support for the Government’s aviation safety agenda in the Asia/Pacific region.

2.2 Civil Aviation Safety Authority (CASA)

CASA’s primary role, as outlined in the *Civil Aviation Act 1988*, is the safety regulation of civil operations in Australia and the operation of Australian aircraft overseas.

In fulfilling its responsibilities CASA sets aviation standards, enforces safety standards, and promotes industry awareness and understanding of aviation standards and safety issues.

The Government, through the Minister for Infrastructure and Transport, also outlines its priorities for CASA in a publicly available Statement of Expectations. These expectations reaffirm that the safety of passenger carrying operations should remain CASA’s highest priority.

Under the *Airspace Act 2007* and *Airspace Regulations 2007*, CASA, through the Office of Airspace Regulation (OAR), also has primary responsibility for determining Australia’s civil airspace safety regulatory requirements. The airspace legislative framework provides for CASA to ensure that Australian airspace is administered and used safely. CASA is also required to conduct regular reviews of existing airspace classifications, air traffic services and facilities.
CASA’s operations are also guided by the Australian Airspace Policy Statement (AAPS), which outlines the Government’s objectives for civil airspace administration. The AAPS currently outlines three key policy objectives:

- support for ICAO’s Global Air Traffic Management Operational Concept (GATMOC) and use of ICAO airspace classifications;
- enhanced air traffic management services at regional aerodromes regularly served by passenger transport services, as determined by CASA; and
- effective cooperation between CASA and Australia’s air traffic service providers, Airservices and Defence.

CASA’s assessments are based on robust safety and risk analysis, for example its aeronautical studies are based on the principles outlined in the Common Risk Management Framework for Airspace and Air Traffic Management.

CASA will continue to be the final arbiter of standards and regulations related to the wider application of new and advanced technologies into the Australian air traffic management system. CASA regulations are also subject to standard parliamentary scrutiny processes.

The Government expects CASA’s regulatory decisions to be implemented by Airservices and industry in accordance with clearly established timeframes and the appropriate regulatory mandates where applicable.

2.3 Department of Infrastructure and Transport (the Department)

The Department’s role is to provide policy advice to the Government in relation to air traffic management matters, including advice on Airservices and CASA’s strategic direction, their planning, financial and operational performance, and their governance framework.

The Department chairs the Aviation Policy Group (APG) and Aviation Implementation Group (AIG).

The APG brings together the Secretary of the Department, the Chief Executive Officer of Airservices, the Director of Aviation Safety in CASA and the Chief of Air Force.

The APG provides a forum for effective inter-agency policy coordination, for working through air traffic management and other aviation cross agency issues at a strategic level, for sharing information and for seeking comments from members on a range of ATM policy and planning issues.

The APG is not a decision making group as each individual agency retains their respective legislative and regulatory responsibilities and authority.

The AIG is the officials’ working group that is responsible for coordinating and carrying forward cross agency work identified by the APG. The AIG is a valuable forum for promoting a common approach to aviation issues.
The Government supports the continuation of APG and AIG as important mechanisms for the identification, discussion and coordination of issues that impact across agency responsibilities.

2.4 Department of Defence

The Department of Defence is an independent air navigation service provider with responsibility for both infrastructure (eg. radar facilities) and air traffic and rescue and fire fighting services at selected airports used by both civil and military aircraft.

The Department of Defence also operates an aircraft fleet that needs access to airspace to meet specific operational requirements and ensure national security. These aircraft have unique requirements in terms of airspace use, infrastructure, supporting services, developing and maintaining military capability, and protecting national security commensurate with the Government’s Defence policy. Defence also has to cater for the provision of air traffic services to its own aircraft, including specific military responses.

The Government fully supports the close work being undertaken by the Department of Defence with Airservices on the development of an integrated national air traffic management system. Greater harmonisation of civil and military aviation procurement, provision of services, and training has significant potential safety, operational and financial benefits for civil and military aviation users.

2.5 Australian Transport Safety Bureau (ATSB)

The ATSB is Australia’s internationally respected independent transport safety investigation agency.

In terms of air traffic management, the ATSB’s investigations of aviation accidents and incidents can help identify relevant safety issues for appropriate follow-up safety actions by other Government aviation agencies and the aviation industry.

The ATSB is also involved in raising safety awareness and facilitating safety action through a range of communication and education activities.

2.6 Industry

The aviation industry will enhance the safety of air traffic operations through continual improvement in air navigation and communications, and complying with regulatory requirements in accordance with established standards, procedures and time-frames.

This role requires sustained investment in the maintenance of aerodromes, aircraft systems, investment in technology that can further enhance safety and efficiency, and the attraction, training and retention of skilled personnel.

Infrastructure and human resource investment by industry should be coordinated with the initiatives and regulatory decisions being taken by government agencies. Such coordination is
imperative given the high degree of inter-relationship between, on the one hand, regulatory, planning and investment decisions taken by CASA and Airservices, and on the other, future investments in air navigation and communications systems being made by aircraft operators.

Through the ASTRA forum, which includes members from a range of aviation industry sectors, industry can also provide coordinated advice on ATM issues to Government through the AIG and APG.

3. **Australia’s Air Traffic Management Policy Directions**

Safety will always be the priority consideration of Australia’s ATM system. Aviation safety is enhanced through the delivery of an effective, efficient and responsive ATM system.

In order to achieve this, the Government’s five key policy directions for our ATM system are:

- robust and integrated planning processes;
- adoption of advanced technology;
- commitment to international harmonisation and ICAO airspace classifications;
- enhanced regional aviation safety; and
- management of environmental impacts from aviation operations.

Safety enhancements to the ATM system, if properly designed and implemented, can also support industry efficiency initiatives, help minimise and better manage environmental impacts (noise and emissions) of aircraft operations, provide better access for aircraft operators, and ensure our national security and Defence Force capability objectives are met.

3.1 **Robust and Integrated Planning**

Australia’s air traffic management system must plan for the future.

These plans must be based on robust safety analysis, allow adequate transition periods to safely make significant changes to air traffic management arrangements, and must be developed and implemented only after effective consultation with a range of key government, industry and community stakeholders.

Cooperation and consultation between the aviation agencies in developing plans is essential to the successful implementation and achievement of consistent and effective air traffic policy outcomes.

Whilst each agency has a role to play in delivering an air traffic management system which continues to enhance safety, often there are flow on effects from each other’s actions. APG therefore provides a key mechanism to achieve inter-agency coordination on air traffic management issues.
CASA will be finalising an **ATM regulatory plan** which outlines its proposed future ATM regulatory and standards requirements – including targets and mandates where appropriate for the implementation of technologies including equipment and procedures. CASA will also outline the standards and regulatory development, and safety and risk assessment processes it will be adopting to finalise these future requirements.

CASA’s plan will provide a vehicle for signalling future regulatory directions to key government, industry and community stakeholders.

CASA’s plan will also detail how future requirements will impact on different sectors of the aviation industry – from major airlines to recreational aviation users and provide for a safe and responsible transition to changes in future air traffic arrangements. The plan will support a phased, gradual technology up-take and operational transition for the aviation industry.

CASA’s plan will take into consideration, amongst other things, the needs of the broader operating environment, the ability of the Australian fleet to transition to new arrangements, and the extent to which legacy systems need to be retained to support transition and to provide backup in the longer term to avoid reliance on a single technology.

Airservices will develop, as the major civil air traffic service provider, in conjunction with the Department of Defence, a **national ATM services and facilities plan**. This plan will implement the Government’s key policy directions, align with CASA’s regulatory plan and outline Airservices’ (and the relevant Defence) future planned investment in infrastructure, equipment and personnel skills and training.

The ATM services and facilities plan will outline the development of air traffic services and a range of projects to affect changes to existing systems and procedures in relation to enroute, terminal and aerodrome areas and supporting infrastructure. Airservices has identified four service delivery environments including east coast, regional, upper airspace and network management services in which it can detail its future services delivery plan.

Better planning will also be enhanced by the establishment of clear criteria to help determine when new, modified or alternate air traffic management services and facilities are required. These criteria will be incorporated into the next update of the Australian Airspace Policy Statement and will confirm the requirement for CASA to complete aeronautical risk reviews.

Government agency ATM plans will be integrated and finalised after consultation with the Government, industry and the community. These plans will also enable industry to align their future planning and investment in communications and navigational equipment, personnel and operational plans with future regulatory and air traffic surveillance requirements.
The coordinated detailed ATM plans will be in line with the GATMOC and include the following:

**CASA**

CASA’s **ATM regulatory plan** will cover the following key areas:
- future proposed standards, rules and operational concepts for ATM technologies and procedures;
- safety and risk assessment approaches to be used;
- meeting ICAO ATM requirements (with any differences clearly noted) and international harmonisation; and
- training and education.

The plan will specifically:
- outline future proposed safety regulatory mandated requirements and timings for communication, navigation and surveillance capability (e.g. Uptake of Mode S, Automatic Dependent Surveillance-Broadcast (ADS-B) out capable transponders and Airborne Collision Avoidance System (ACAS) equipment) and use by aircraft, recognising the primacy of safety and impact on different sectors of the industry;
- cover the future expansion of Approach with Vertical Guidance (APV) in Australia utilising the Barometric Vertical Navigation (Baro-VNAV) aircraft-based augmentations systems and other measures to mitigate against controlled flight into terrain (CFIT), and the outcomes of the review of future Satellite-Based Augmentation Systems (SBAS) capability in Australia;
- include the regulatory aspects of Performance Based Navigation (PBN) for area navigation (RNAV) and Required Navigation Performance (RNP) navigation applications; and
- set out the timely introduction of more controlled airspace (as required), and enhanced ATC services and infrastructure in the enroute environment in Western Australia and growing regional aerodromes.

**Airservices**

Airservices **ATM services and facilities plan** will cover the following key areas:
- communication, navigation and surveillance initiatives including wider use of satellite-based systems while maintaining a robust ground-based surveillance capacity;
- civil/military aviation harmonisation;
- aeronautical information services;
- environmental sustainability;
- workforce planning;
- regional assistance and cooperation; and
- infrastructure investment and life-cycle management.

The plan will specifically:
- maintain a level of investment in national air traffic management infrastructure (including ground and satellite based technology) to address safety, efficiency, capacity and environmental needs;
• detail implementation of CASA’s regulatory decisions in accordance with clearly established timeframes; and
• cover the undertaking of APV design work and infrastructure upgrades to support the introduction of APV.

The short, medium and long term air traffic management initiatives were identified in the Aviation White Paper. These have been updated to reflect further advice on APV and are outlined in Appendix A. CASA’s ATM regulatory plan and Airservices ATM services and facilities plan will be consistent with, and cover, these initiatives.

3.2 Adoption of Advanced Technology

Investment in advanced technology and the ongoing maintenance of critical existing infrastructure is required to ensure a safe and efficient air traffic management system.

Australia will continue to adopt proven advanced technology and international standards with the best outcome for Australia’s air traffic administration and regulation.

Australia’s ATM system should avoid the potential risks associated with ab initio systems development. The decision to adopt new and advanced technology applications should be on the basis of well developed safety cases, appropriate risk analysis, involve the development of detailed operational concepts and robust implementation plans, which must ultimately be assessed by CASA.

Australia is supporting the wider application and use of modern surveillance technology, including satellite based technologies such as Automatic Dependent Surveillance-Broadcast (ADS-B) and satellite navigation technology such as the Global Navigation Satellite System (GNSS).

However, as is the case in other leading aviation countries, Australia will also maintain a robust ground-based surveillance capability, including radar to protect against vulnerabilities from over-reliance on one system, such as the Global Positioning System (GPS).

In December 2009, Airservices commissioned the world’s first satellite-based air navigation system with the deployment of an ADS-B technology network and a new digital communications network to support it. The system is supported by 28 ADS-B ground station networks delivering continuous surveillance of aircraft operations in high level airspace across western, central and northern Australia where radar coverage did not previously exist.

In June 2010, Airservices commissioned Australia’s first Wide Area Multilateration (WAM) radar system in Tasmania. The system uses 14 widely dispersed ground stations to determine the exact position of aircraft without the need for a rotating radar antenna through the use of multilateration and ADS-B.

Australia will increasingly adopt these technologies to ensure that the safety of its air traffic management system is enhanced, while maintaining a robust ground-based surveillance capacity including a modern enroute radar network.
The wider adoption of advanced technology is integrally linked with the transition from route-based navigation using terrestrial navigation aids to area navigation using satellite navigation. The adoption of these applications will not only enhance aviation safety but can also generate efficiency and environmental benefits.

Future ATM capabilities should support:

- a national satellite and ground based, efficient, flexible ATM system utilising air-to-ground data link surveillance for air traffic separation;
- aircraft utilising satellite navigation as the sole means, without the need to resort to ground based aids in normal situations;
- the ability of air traffic surveillance for traffic conflict avoidance; and
- more efficient manoeuvres, whereby pilots use procedures such as flexible routing, in-trail climbs, aircraft sequencing and merging on approach.

The applications being implemented include:

- aircraft PBN specifications for RNAV and RNP as the basis for precision navigation, instrument procedure design, and resultant air traffic separation standards;
- APV as the preferred instrument approach standard where precision approaches are not available;
- runway aligned Lateral Navigation (LNAV) only approaches where APV using Baro-VNAV cannot be achieved;
- use of ADS-B OUT for air traffic control surveillance and traffic information services;
- introduction of ADS-B IN (ADS-B reception by aircraft) as a pilot situational awareness tool and enabler of new operations using Airborne Separation Assistance Systems (ASAS);
- deployment of Advanced Surface Movement Guidance and Control Systems (A-SMGCS) at major airports; and

RNP and PBN in general, is identified by ICAO as an enabler of the Global Air Navigation Plan, and is considered an essential element in both the US NextGen and European Single European Sky ATM Research (SESAR) plans, in delivering the air traffic management target operational concept.

Use of GNSS will be required as the primary navigation system to support the next generation aircraft enabling them to fly more accurate flight paths. GNSS augmentation systems (ground based, aircraft based or space based) will continue to be considered by Government and Australia’s aviation industry as appropriate.

Techniques such as A-SMGCS have been successfully used for airport surveillance for quite some time, particularly in Europe. A-SMGCS, an air traffic surveillance system, enables aircraft and vehicles on the airport surface runways, taxiways and aprons to be accurately tracked in all visibility conditions by Air Traffic Control.
In response to growing air traffic movements at major airports, Airservices Australia is installing A-SMGCS at Sydney, Melbourne, Brisbane and Perth airports. The technology relies on air traffic control transponder transmissions, and also uses Mode S and ADS-B information when this is available.

APV is recognised by ICAO as a key risk mitigator against CFIT accidents during the landing phase of flight. APV operations provide a greater safety improvement for precision approaches over non-precision approaches. ICAO recognises Baro-VNAV and augmented GNSS as suitable technologies to support vertical guidance applications mitigating against CFIT, and has enabled APV operations through the development of procedure design criteria for both augmentation technologies.

The implementation of APV at all runways in Australia, including at very small aerodromes, raises challenges, resourcing and justification issues for Australia, given our safety priority on airports serving our major passenger operations.

Australia’s first priority is the establishment of a Baro-VNAV implementation plan to set out the adoption of the use of this technology to achieve APV at a range of aerodromes having regular passenger transport services across Australia. This will involve a coordinated approach by Government agencies and airport and aircraft operators.

3.3 International Harmonisation

Australia is a significant participant in international aviation forums, working towards international ATM harmonisation, in order to improve interoperability and safety.

As an active member state of ICAO, Australia strives to achieve a closer alignment with the vision of an integrated, harmonised and globally interoperable ATM system, as presented by ICAO in its Global Air Traffic Management Operational Concept (GATMOC).

GATMOC outlines the concept of an integrated and global ATM system based on clearly established operational requirements. GATMOC is visionary in nature and is intended to guide the high-level implementation of communication, navigation, surveillance and air traffic management technology by providing a description of how the emerging and future air navigation system should operate.

The operational concept is independent of technology. GATMOC seeks to maintain the vitality of civil aviation and ensure that a safe, secure, efficient and environmentally sustainable air navigation system is available at the global, regional and national levels. It takes a long term strategic view through to 2025 and beyond.

The concept components include:

- airspace organisation and management;
- aerodrome operations;
- demand and capacity balancing;
• traffic synchronisation;
• conflict management;
• airspace user operations; and
• ATM service delivery management.

ICAO continues to encourage all states to better plan and harmonise the enhancement of safety, environmental and operational efficiency of future ATM and navigation systems.

In particular ICAO has supported:

• precision navigation enhancing aviation safety and also allowing more efficient use of airspace;

• instrument approach procedures that provide vertical guidance, enabling significant safety and service enhancements at regional and remote aerodromes;

• enhanced collision risk mitigation primarily through the expansion of air traffic surveillance including the wider application of satellite-based surveillance technology; and

• navigation capabilities that support optimum aircraft routes reducing fuel burn with attendant economic and environmental benefits.

To ensure a safer, globally interoperable and efficient ATM system (as sought by ICAO) is achieved, the Government’s aviation agencies, in consultation with industry, will work to integrate a variety of technologies to provide an internationally harmonised, performance-based ATM system that caters for a range of aircraft capabilities in diverse operating environments and meets our own future ATM requirements.

Ongoing investment in satellite based technology, such as Automatic Dependent Surveillance – Broadcast (ADS-B) and Global Navigation Satellite Systems (GNSS) will play a key role in developing such a system.

The Government also fully supports the use of the internationally-recognised ICAO airspace classification system (Class A to G airspace) in airspace administration. ICAO standards and recommended practices (SARPs) also provide an important basis for airspace administration. Any deviations from the SARPs will be well justified, documented and formally notified to ICAO as a difference.

The Government expects CASA to adopt international best practice in airspace administration, including adopting proven international systems that meet our airspace requirements, recognising international airspace systems (such as the National Airspace System (NAS) of the USA) include a range of characteristics that should be considered, and implemented as appropriate, by CASA.

Aviation agencies will also continue to monitor work that is likely to be considered by an ICAO Air Navigation Conference later in 2012, in relation to the use of Aviation System Block Upgrades (ASBU) to enhance global improvements in air traffic management.
3.4 Enhanced Regional Aviation Safety

In the Australian Airspace Policy Statement (AAPS) the Australian Government has recognised the importance of enhanced regional aviation safety.

The AAPS identifies enhanced air traffic management services at regional aerodromes regularly served by passenger transport services, as determined by CASA, as a key Government airspace policy objective.

In 2009 the Government requested a report from CASA on options for improving airspace, air traffic services and facility arrangements at ten major regional airports in Australia (Hobart, Launceston, Sunshine Coast (Maroochydore), Mackay, Hamilton Island, Rockhampton, Albury, Coffs Harbour, Tamworth and Alice Springs).

Following receipt of this report in July 2010, the Government asked Airservices to work with CASA and the Department to finalise an implementation plan for enhancements to aviation safety at regional airports.

The proposed enhancements will provide expanded air traffic services and surveillance arrangements for regional passenger services and will be phased-in over the next four years. It is proposed that these enhancements will be extended to similar growing regional airports such as Broome and Karratha in Western Australia.

Implementation of improved air traffic services and surveillance under the plan has already commenced at Hobart and Launceston in June 2011.

The Government supports Airservices ongoing investment of over $100 million in a national towers program including the construction of new, and upgrading of existing facilities. This investment includes new towers at Rockhampton and Broome, and major tower upgrades at airports such as Gold Coast and Karratha.

CASA and Airservices have also taken steps to improve safety at the capital city secondary airports many of which have significant levels of general aviation operations, particularly flight training. These airports include Bankstown and Camden (NSW), Moorabbin (VIC), Jandakot (WA), Parafield (SA), and Archerfield (QLD).

In June 2010, international Class D controlled airspace arrangements were introduced by CASA and implemented by Airservices to enhance air traffic control and safety requirements at these airports. These changes followed an extensive national safety education, awareness and training program undertaken by CASA.

3.5 Managing Environmental Impacts

As well as safety and efficiency benefits, modern ATM systems can enable better management of environmental impacts (noise and emissions) from aviation operations.
Advanced technologies and the more efficient use of airspace can potentially reduce the noise footprint on communities surrounding airports. Improved air traffic management systems can also reduce aviation emissions.

There are a number of other air traffic management operational procedures which reduce emissions, including flextracks; air traffic control sequencing; and continuous descent approaches to runways.

One of the major operational directions that will impact on international aviation is the transition to Performance Based Navigation (PBN). PBN specifications can support improvements in aircraft safety, efficiency and environmental performance.

PBN is navigation based performance requirements for aircraft operating along an air traffic services route, on an instrument approach procedure or in a designated airspace. PBN represents a fundamental shift from sensor (equipment) based navigation concept to a performance (systems) based navigation concept. Navigation specifications need no longer be met through prescribed equipment components but rather through an aircraft’s navigation systems ability to meet required performance.

Required Navigation Performance (RNP) procedures for arrival and departure flight paths potentially offer reduced environmental impacts through more efficient use of airspace.

In the 2011-13 Airservices Statement of Expectations, the Government has asked Airservices to continue work on an implementation plan for the potential wider use of RNP approaches at Australian airports to enhance safety and efficiency, reduce emissions’ and minimise noise impacts, and the steps Airservices will take to consult with community and industry stakeholders on the plan.

Airservices will work with airport owners to ensure that efficiency and emissions savings, particularly from long haul flights, are not lost in lengthy holding patterns and tarmac delays at busy airports.

The wider application of advanced air traffic management technology and procedures must be consistent with the Government’s policy of fairer noise sharing for communities living near the vicinity of airports and near flight paths. Airservices will undertake effective consultation with the community, industry and Government on the development and implementation of significant changes to air traffic services.

The Government will continue to encourage initiatives which support the further adoption of the flexible use of airspace concept. Flexible airspace aims to maximise the use of available airspace volumes while providing the required segregation for non-compatible activities.

Building on the work of CASA and the Department of Defence in significantly reducing the number of twenty four hour restricted airspace areas in Australia, the Office of Airspace
Regulation (including a Defence representative) working with Airservices and industry will continue to improve the flexibility of both civil and Defence administered airspace. These initiatives are fully consistent with the increased commonality and interoperability of our future ATM systems. Flexible airspace approaches can have environmental as well as safety and efficiency benefits for airspace users and communities living in noise affected areas.

The Government is committed to the effective distribution of information and effective consultation with the community on air traffic management environmental issues.

Consistent with a key initiative announced in the Government’s Aviation White Paper, the Airservices Board established an independent Aircraft Noise Ombudsman (ANO) on 1 September 2010.

The ANO’s role is to oversee the handling of aircraft noise enquiries and complaints by Airservices, monitor and review Airservices consultation arrangements and make recommendations for improvements where necessary. The ANO has already produced a review of complaints handling with eighteen recommendations which have been accepted and will be progressively implemented by Airservices.

The ANO will provide regular reports to the Airservices Board and will produce a detailed annual report for publication.

4. Funding

The Aviation White Paper outlined the three principles of the Government’s funding strategy for CASA:
- maintaining ongoing Budget funding for CASA to perform its public safety enforcement and regulatory functions;
- maintaining the existing arrangements which ensures all revenue raised through the aviation fuel excise go directly to fund CASA’s regulatory role; and
- capping the sum of CASA’s regulatory fees at the current $15 million per year, subject to CPI increases for at least five years.

The Office of Airspace Regulation in CASA is funded through fuel excise.

The provision of Air Traffic Management services will continue to be funded by air navigation charges on industry set by Airservices Australia.

Airservices is subject to economic oversight, to encourage fair and transparent price setting, and operates under a Price-Cap regulation (CPI-X) administered by the Australian Competition and Consumer Commission (ACCC) pursuant to the *Competition and Consumer Act* 2010. Airservices is required to notify the ACCC of proposed price increases for its three declared services under the *Competition and Consumer Act* 2010 (enroute, terminal navigation and Aerodrome Rescue and Fire Fighting Services). The ACCC assesses the proposed price changes and can decide either to object or reject the price increases.
In the Aviation White Paper, the Government announced that Airservices would be reviewing terminal navigation services pricing options – with a view to establishing a framework that facilitates the enhancement of air traffic services around Australia.

This review was completed earlier in 2011, in consultation with industry, and the outcomes of the review incorporated into Airservices long term (five year) pricing agreement, cleared by the ACCC, which commenced on 1 October 2011. The agreement includes a real reduction in enroute charges over the five year period.

5. Implementation/Reporting

The Government will require quarterly reporting by CASA and Airservices on their progress with the implementation of their air traffic management strategic plans.

Air traffic management by its very nature is continually evolving therefore the Australian ATM Future Directions Paper has been developed with this consideration in mind. It will be reviewed at least every three years to reflect new developments and changes in the ATM operating environment. Similarly, Airservices and CASA ATM plans should be reviewed on a three yearly basis.
Appendix A: Australian ATM Initiatives

In summary, Australia, consistent with the ICAO goals, and to harmonise with developments in other leading aviation nations, has identified a number of key ATM initiatives which CASA and Airservices, in their respective regulatory and service provision roles, will seek to pursue:

Short Term (2012 to 2016)
- Current investment in national infrastructure (including ground and satellite based technology) to address safety, efficiency, capacity and environmental needs.
- Closer alignment with ICAO based airspace classifications, adoption of proven international airspace systems and use of sound risk management processes for airspace management and administration.
- Completing the reviews of Australian airspace at airports to implement the Government’s key AAPS reform directions – particularly alignment with ICAO and international best practice in airspace management and enhanced regional air traffic management services.
- Continuation of Class D airspace arrangements which commenced in 2010 at general aviation aerodrome procedures (GAAP) aerodromes.
- Introduction of more controlled airspace with, as required, enhanced ATC services and infrastructure as determined by CASA, in the enroute environment in Western Australia, as well as at growing regional aerodromes in Western Australia and in eastern Australia.
- ADS-B OUT upper airspace mandate from December 2013.
- Performance based navigation capability appropriate to the operation will be used by all instrument flight rules aircraft by 2016.

Medium Term (2016–2020)
- Wider regulatory requirements for mandated communication, navigation and surveillance capability (e.g. uptake of Mode S and ADS-B OUT capable transponders) and use by aircraft set by CASA.
- Wider implementation of APV procedures for instrument runways used by APV-capable aircraft and runway aligned LNAV only procedures where APV procedures cannot be achieved.

Long Term (2021–2025)
- The wider application of satellite technology, monitoring consistency with international timetables, including the provision of required back up ground based facilities.
- Electronic surveillance of traffic by either aircraft or air navigation service providers will be assured for operations in controlled airspace generally and from the surface within specified volumes of airspace at aerodromes with traffic densities exceeding a risk-based threshold.
- APV guidance or runway aligned LNAV only procedures for all Australian instrument runways where achievable.
### Appendix B: Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AAPS</td>
<td>Australian Airspace Policy Statement</td>
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<tr>
<td>ACAS</td>
<td>Aircraft Collision Avoidance System</td>
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<tr>
<td>ADS-B</td>
<td>Automatic Dependent Surveillance-Broadcast</td>
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<td>AIG</td>
<td>Aviation Implementation Group</td>
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<tr>
<td>APG</td>
<td>Aviation Policy Group</td>
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<tr>
<td>APV</td>
<td>Approach with Vertical Guidance</td>
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<td>ASAS</td>
<td>Airborne Separation Assistance Systems</td>
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<tr>
<td>A-SMGCS</td>
<td>Advanced Surface Movement Guidance and Control</td>
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<tr>
<td>ASTRA</td>
<td>Australian Strategic Air Traffic Management Group</td>
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<tr>
<td>ATM</td>
<td>Air Traffic Management</td>
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<tr>
<td>Baro-VNAV</td>
<td>Barometric Vertical Navigation</td>
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<td>CASA</td>
<td>Civil Aviation Safety Authority</td>
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<tr>
<td>CFIT</td>
<td>Controlled Flight into Terrain</td>
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<td>EU</td>
<td>European Union</td>
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<tr>
<td>GATMOC</td>
<td>Global Air Traffic Management Operational Concept</td>
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<tr>
<td>GNSS</td>
<td>Global Navigation Satellite System</td>
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<td>ICAO</td>
<td>International Civil Aviation Organization</td>
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<td>LNAV</td>
<td>Lateral Navigation</td>
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<td>OAR</td>
<td>Office of Airspace Regulation</td>
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<tr>
<td>PBN</td>
<td>Aircraft Performance Based Navigation</td>
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<tr>
<td>RNAV</td>
<td>Area Navigation</td>
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<tr>
<td>RNP</td>
<td>Required Navigational Performance</td>
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<tr>
<td>SARPS</td>
<td>Standards and Recommended Practices</td>
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<tr>
<td>SBAS</td>
<td>Satellite-Based Augmentation System</td>
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