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The Australian Airports Association (AAA) is the national industry voice for airports in Australia. The AAA represents the interests of more than 260 airports and aerodromes Australia wide – from local country community landing strips to major international gateway airports. The AAA’s members include Adelaide, Brisbane, Cairns, Canberra, Darwin, Gold Coast, Hobart, Perth, Melbourne and Sydney airports.

The AAA serves airports across the entire national aviation infrastructure network. This includes:

- Tier 1 Capital City Airports
- Tier 2 Non-Capital International Gateway Airports
- Tier 3 Major Regional Airports with direct interstate services
- Tier 4 Major Regional RPT airports without direct interstate services (with more than 20,000 passengers)
- Tier 5 Regional Airports without direct interstate services (with less than 20,000 passengers)
- Tier 6 Regional Airports without Regular Passenger Transport services (general aviation operations only)
- Tier 7 Remote Community Aerodromes (exist for community service aviation: medical, emergency flights).

There are a further 100 corporate partners representing aviation stakeholders and organisations that provide goods and services to the airport sector. The AAA facilitates co-operation among all member airports and their many and varied partners in Australian aviation, whilst contributing to an air transport system that is safe, secure, environmentally responsible and efficient for the benefit of all Australians and visitors.

If you have any questions regarding this document please contact the AAA on 02 6230 1110.

ABOUT THE AUSTRALIAN AIRPORTS ASSOCIATION

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The Australian Airports Association (AAA) commissioned preparation of this guideline for regional airport master planning to assist regional airport operators who often do not have the planning knowledge or resources typically available to the larger airports.

This guideline is divided into two parts. Part A provides general guidance relating to:

- The importance of airport master planning;
- Applicable reference documents;
- The basic master planning process;
- The regulatory and policy context;
- Critical planning parameters;
- Consultation and engagement techniques; and
- Key elements of a Regional Airport Master Plan.

Part B of this document then provides a basic template or structure for a Regional Airport Master Plan which can be used as a starting point or table of contents for airport operators who wish to prepare their own Master Plan, or it could be used to help prepare a tender specification for an airport Master Plan.

This guideline has been prepared with smaller regional and rural airports in mind, rather than large metropolitan or major regional airports. It is primarily intended for airports with the following characteristics:

- Generally council owned and operated;
- Not a Commonwealth-leased airport (ie. Airports Act 1996 does not apply);
- General Aviation (GA) is the primary activity;
- No Regular Public Transport (RPT) services or limited RPT; and
- Has limited funds available for master planning.

This document should not be seen as a definitive set of rules for a Regional Airport Master Plan. This guideline is not intended to be prescriptive, nor provide an exhaustive list of information on matters that should be taken into account, or dictate the types of investigations that should be undertaken. This guideline seeks to provide a useful reference to airport operators who may be considering preparation of a Master Plan for their airport, or who may be preparing briefs for the preparation of a full Master Plan or elements of a Master Plan.

For airports that are not controlled under the Commonwealth Airports Act 1996, there is no definitive set of rules for the preparation of a Master Plan. Each airport is different and a Master Plan for any airport needs to be tailored to the specific circumstances and the particular issues that apply in each case.

It should also be noted that these guidelines relate to the preparation of a Master Plan for the use and development of an airport site with a focus on the physical infrastructure and facilities. This is not a guideline for the preparation of a Business Plan, Marketing Plan or the like for an airport.

This information in this guideline is for general information purposes only. It is not intended as business, planning, legal or regulatory advice and should not be construed or relied on as such. Before making any commitment of a financial nature or otherwise, airports should consider their own specific needs and circumstances and seek advice from appropriately qualified advisers. No material contained within this guideline should be construed or relied upon as providing recommendations in relation to any particular development or planning outcome or decision.
1 INTRODUCTION

Airports are essential public infrastructure assets. Airports can generate significant social and economic benefits to communities, but they need to be properly planned and protected over the long term to realise these benefits and ensure their safe and efficient operation.

Airports are complex facilities and experience has shown that the planning issues associated with airports are often not well understood. Poor planning of airports can lead to a range of problems including operational restrictions, amenity impacts for nearby residents and airport closures in the extreme case. A Master Plan is central to the orderly and proper planning of any airport.
There are around 250 airports across Australia which have regular passenger services and many more much smaller aerodromes and landing strips around the country, with reports of some 2000 across Australia.

Australia’s network of airports, across major urban centres and regional areas, form an integral part of the national economic infrastructure and are critical to connecting communities and enhancing broader economic performance.

The AAA commissioned Deloitte Access Economics to undertake an economic and social assessment of the airport industry. The result was a report titled Connecting Australia: The economic and social contribution of Australia’s airports (Deloitte Access Economics, June 2012). A copy of this report is available to download from the AAA website.

The Deloitte study examines the significant role of Australia’s network of airports, and provides detailed information on economic and social contribution of Australia’s airports. Some of the key points arising from this study are:

» Airports are capital intensive businesses, underpinned by their principal role as transport infrastructure providers. As such, airports are deeply linked into most economic activities, with these linkages increasingly driven by growth in leisure tourism and the regional expansion of strategic resource and agricultural activities.

» Airport infrastructure, whether terminal facilities or runway works, are among the most expensive forms of commercial and civil construction.

» In 2011, Australia’s airports generated a total economic contribution of around $17.3 billion, equivalent to around 1.2% of Gross Domestic Product. National employment at airports was estimated at approximately 115,200 full-time equivalent (FTE) workers.

» As a result of the activity at airports, there are further flow-on benefits that span across the Australian economy. These include induced effects that are generated by the successive rounds of spending enabled by the income and employment supported by the airport industry.

» Beyond their immediate economic footprint, airports play an important social role in connecting individuals, families and communities with the rest of the country and indeed the world.

» Airports provide vital services to their communities, including the facilitation of mail and time-sensitive freight deliveries, the Royal Flying Doctor Service, CareFlight, bush taxis, and the transfer of workers to employment centres and job sites.

» Many airports provide training facilities and precincts for high-tech jobs in aviation to ensure the continued and sustainable development of a skilled workforce for the industry.

» Airports recognise their impact on local communities and are increasingly participating in positive activities such as: environmental sustainability initiatives; community engagement programs; and the sponsorship of cultural, sporting and charity events, to ensure they are acting as good corporate citizens within their communities.

» There are significant differences in the business orientation of regional and remote airports and that of much larger airport operations. In many isolated parts of Australia, airports remain the only practical means of access to emergency and essential services and therefore they tend to focus on principal transport infrastructure performance.

» There has been a declining trend in the number of regional airports with RPT services over the last two decades. Since 2005, RPT services have ceased at 45 regional airports (mainly on lower density routes), while 25 airports have gained new RPT services. On the other hand, the overall number of passenger movements has increased over this period, from 8.5 million passengers to 22.5 million passengers.

As previously stated, airports need to be properly planned and protected to realise these benefits and a Master Plan is central to the orderly and proper planning of any airport.

The AAA has also published a report titled Australia’s Regional Airports – Facts, Myths & Challenges (AAA, November 2012) which contains further information that regional airport operators may find useful when preparing a Master Plan.
3 PURPOSE OF AIRPORT MASTER PLANNING

The purpose or objectives behind each airport Master Plan will vary according to the particular location and circumstances. However, in general master planning for airports can have several purposes which can be divided into on-airport and off-airport objectives.

It is important to define the purpose or objectives of the Master Plan early in the process to set the scene for the project.

3.1 On-Airport Planning Objectives

In relation to the airport site itself, the key objectives of a Master Plan usually revolve around:
» Maintaining the ability for aircraft to operate safely and unrestricted
» Facilitating the ability for the airport to grow and expand in response to demand
» Promoting the role of the airport and its significance as a community asset
» Providing for the airport to increase revenue, including through non-aviation development
» Safeguarding of the airport’s long term plans
» Ensuring compliance with relevant regulations
» Managing environmental and heritage constraints

3.2 Off-Airport Planning Objectives

Off-airport planning is often an area overlooked or inadequately addressed by airport Master Plans. Nevertheless this is a critical issue for the long term safeguarding of any airport and it should be addressed.

In relation to off-airport planning a Master Plan generally aims to minimise the potential encroachment of incompatible activities and development in the vicinity of the airport, particularly in terms of:
» aircraft noise impacts
» intrusions into the protected operational airspace of the airport
» distractions to pilots from lighting in the vicinity of the airport
» wildlife strikes
» building generated wind-shear and turbulence from nearby development
» public safety
» impacts on navigational aids

An airport Master Plan may also address other off-airport planning issues such as ground transport arrangements serving the airport.

It is important that on and off airport planning and development are linked and coordinated, and a comprehensive airport Master Plan can certainly assist in achieving this aim.

Measures to achieve these objectives are discussed later in this guideline.
The issues to be considered in the planning of airports are many and varied. In order to assist, and in some cases regulate, the planning and design of airport facilities, there are several documents that provide guidance for airport planners and managers.

The key guidance documents to be considered in the planning process are:

» The International Civil Aviation Organisation’s Annex 14 – Aerodromes, Volume 1 Aerodrome Design and Operations (ICAO Annex 14) which contains Standards and Recommended Practices that prescribe the physical characteristics, obstacle limitation surfaces and visual aids to be provided at aerodromes, as well as certain facilities and technical services normally provided at an aerodrome. [The specific standards applicable in Australia however, are specified in the Civil Aviation Safety Regulations.]

» The Civil Aviation Safety Regulations (CASR), particularly CASR Part 139 Aerodromes and the Manual of Standards Part 139 – Aerodromes which contain the mandatory Australian standards for the design of airport facilities. CASR Part 139 and the Manual of Standards Part 139 (commonly referred to as the MOS) prescribe the requirements for aerodromes used in air transport operations, in accordance with ICAO Annex 14. The MOS is the most important document relating to airport planning in Australia, and is discussed further in section 6 of this report.

» The International Civil Aviation Organisation’s Airport Planning Manual, particularly Part 1: Master Planning which provides guidance on the preparation of airport master plans and the key considerations to be taken into account in the planning process.

» The International Civil Aviation Organisation’s Aerodrome Design Manual, particularly Part 1: Runways and Part 2: Taxiways, Aprons and Holding Bays which provide detailed guidance on the design of the critical airfield facilities.

» The International Air Transport Association’s Airport Development Reference Manual, which provides guidance on designing airport facilities with airport user needs in mind.

» The Federal Aviation Administration’s Advisory Circular AC 150/5300-13: Airport Design, which contains the FAA’s standards and recommendations for airport design applicable to airports in the USA. Whilst not directly applicable to airports in Australia, this document is sometimes useful as an alternative or complementary source of information.

» The National Airports Safeguarding Framework (NASF) is a national land use planning framework that aims to improve aviation safety, airport protection and community amenity by ensuring that these matters are considered in land use planning decisions. NASF is discussed further in section 6 of this report.

There are also a number of very informative books relating to airport planning and development including:


Another source of valuable information is other airport Master Plans. These are usually available on the airport operator’s website, and examples are also available in the Industry Resource Library on the AAA’s website.

By reference to these documents when preparing a new airport Master Plan or making changes to an existing airport, the considerations for the plan and requirements for the airport can be determined and addressed through an informed planning process.
5 BASIC PLANNING PROCESS

There is no standard process or methodology for the preparation of an airport Master Plan. The process for each airport will vary according to its particular circumstances and the requirements of the airport operator. However, in the following sub-sections a basic or generic process is provided as a starting point. A summary flowchart is provided at the end of this section. The flowchart includes an indication of the stakeholder consultation process, which is discussed further in section 8.

5.1 Stage 1: Situation Analysis

The first stage in preparing an airport Master Plan would typically involve a situation analysis, that is, an assessment of the existing situation. In this stage the airport operator or airport planner should essentially ask the question, where are we now?

In this stage the following matters should be considered and documented:

- Regional context
- Socio-economic context
- Role of the airport, why does it exist?
- Importance of the airport to the region
- Current site conditions
- Prevailing weather
- Surrounding land – topography, land use, zoning etc
- Existing aviation and non-aviation activities on the site
- Assessment of existing facilities – are they adequate, are there any existing non-conformances?
- Previous and current plans relating to the airport
- Airport’s governance structure
- Environmental and heritage constraints
- Regulatory and policy context (see section 6 for further details)
- Key stakeholders
- Ground transport access to the site
- Utility services
- Assessment of the competition (if any) ie. other airports in the region

At this stage it is also often helpful to undertake a SWOT (Strengths, Weakness, Opportunities and Threats) analysis of the airport. The outcomes of the SWOT analysis will not only assist in understanding the existing situation, but they can also be used to help inform the subsequent stages of the master plan process.

In some cases it may be appropriate to undertake a full risk assessment at this stage to ensure that risks that may affect the airport are understood, considered and addressed in the Master Plan where appropriate. Risks that may affect the preparation of the Master Plan should also be considered.

5.2 Stage 2: Future Direction

This stage of the process is essentially about gaining an understanding of how the airport is likely to change over the planning period (usually 20 years) and, importantly, how the airport operator would like to see it change.

In this stage the airport operator or airport planner would ask questions such as:

- Where do we want to be in the future?
- What do we want to achieve?
- What do we want the airport to look like in 20 years?
- What do key stakeholders want to achieve? [Consultation required, see section 8]
- What does government policy say?
- What are the airport growth forecasts?
- What opportunities are there?
- Are there any threats to the future development of the airport?

The answers to the last two questions should have been established through the SWOT analysis.

The answers to these questions would then be encapsulated and documented in a strategic vision or mission statement for the airport and a series of more specific goals or objectives.
5.3 Stage 3: Strategy Development

Stage 3 is about answering the question, how do we get there? That is, how does the airport achieve the vision, goals and objectives identified in stage 2 and respond to forecast growth. This requires the development of the strategies and plans that will be the core of the Master Plan.

In this stage the following matters should be considered and documented:

» The critical airport planning parameters (see section 7 for further details)
» Identification of key requirements for airport development in response to forecast growth
» Strategies, plans and concepts for (as required):
  - Airport land use
  - Facilities development
  - Ground transport
  - Environmental management
  - Heritage management
  - Airport safeguarding
  - (See sections 9.2 to 9.7 for further details)

5.4 Stage 4: Implementation

The final stage of the process is to answer the question, how do we ensure arrival? That is, how will the Master Plan be implemented?

This requires the development of an Implementation Plan which should include:

» Identification of specific actions required to implement the plan
» Trigger points for each action
» Broad indication of likely timing for each action

Cost estimates for key projects, and possible funding sources, may also be outlined in the Implementation Plan.

The Implementation Plan is discussed further in section 9.8
FIGURE 1: BASIC MASTER PLAN PROCESS

MASTER PLAN DEVELOPMENT

PROJECT INCEPTION

STAGE 1 – SITUATION ANALYSIS
Where are we now?
Existing context and conditions
Regulatory and policy context

CONSULT KEY STAKEHOLDERS

STAGE 2 – FUTURE DIRECTION
Where do we want to be?
Vision, goals and objectives

CONSULT KEY STAKEHOLDERS

STAGE 3 – STRATEGY DEVELOPMENT
How do we get there?
Strategies, plans and concepts

CONSULT KEY STAKEHOLDERS

STAGE 4 – IMPLEMENTATION PLAN
How to we ensure arrival?
Actions to implement the plan

CONSULT KEY STAKEHOLDERS

DRAFT MASTER PLAN

CONSULT KEY STAKEHOLDERS

FINAL MASTER PLAN

STAKEHOLDER CONSULTATION
(See section 8)

PREPARE CONSULTATION PLAN
IDENTIFY KEY STAKEHOLDERS

CONSULT KEY STAKEHOLDERS

CONSULT KEY STAKEHOLDERS

CONSULT KEY STAKEHOLDERS

CONSULT KEY STAKEHOLDERS
6. REGULATORY AND POLICY CONTEXT

Consideration of the regulatory and policy context relevant to the airport and preparation of the Master Plan is essential.

There are a number of regulatory and policy documents that will guide or influence the future use and development of the airport and which therefore need to be considered. It is important to understand this underlying context to determine the standards or guidelines relevant to the achievement of the Master Plan objectives.

6.1 National Rules and Standards

Whilst all air transport regulations stem from the Chicago Convention on Civil Aviation 1944, and the associated annexes, they are promulgated at the national level by governments in accordance with the Convention’s articles and annexes. Member States develop a national legal and administrative framework based on their commitments to the Chicago Convention. In Australia this occurs through the Civil Aviation Act 1988 and associated regulations which are administered by the Civil Aviation Safety Authority (CASA).

The relevant regulations in Australia are the Civil Aviation Regulations 1988 (CARs), which are gradually being replaced by the Civil Aviation Safety Regulations 1998 (CASRs). CASR Part 139 prescribes the requirements for aerodromes used in air transport operations, in accordance with ICAO Annex 14 - Aerodromes. The Manual of Standards (MOS) - Part 139 Aerodromes is made pursuant to CASR Part 139. The MOS sets out the detailed standards and operating procedures for aerodromes used in air transport operations in Australia.

6.2 National Airports Safeguarding Framework

The National Airports Safeguarding Framework is a national land use planning framework that aims to:

- improve community amenity by minimising aircraft noise-sensitive developments near airports including through the use of additional noise metrics and improved noise-disclosure mechanisms; and
- improve safety outcomes by ensuring aviation safety requirements are recognised in land use planning decisions through guidelines being adopted by jurisdictions on various safety-related issues.

The National Airports Safeguarding Framework (NASF) is comprised of:

- Principles for National Airports Safeguarding Framework
- Guideline A: Measures for Managing Impacts of Aircraft Noise
- Guideline B: Managing the Risk of Building Generated Wind-shear and Turbulence at Airports
- Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports
- Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation
- Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports
- Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports.

Copies of the NASF principles and guidelines can be downloaded from the Department of Infrastructure and Regional Development’s website.

NASF will be directly relevant to all airport Master Plans and can provide valuable guidance and assistance for off-airport planning matters.

The National Airports Safeguarding Advisory Group (NASAG), comprising of Commonwealth, State and Territory Government planning and transport officials, the Australian Government Department of Defence, the Civil Aviation Safety Authority (CASA), Airservices Australia and the Australian Local Government Association (ALGA), developed the Framework.

6.3 Environment Protection and Biodiversity Conservation Act

The Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) is the Australian Government’s central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as matters of national environmental significance.
The nine matters of national environmental significance (MNES) are:

» world heritage properties
» national heritage places
» wetlands of international importance (often called ‘Ramsar’ wetlands after the international treaty under which such wetlands are listed)
» nationally threatened species and ecological communities
» migratory species
» Commonwealth marine areas
» the Great Barrier Reef Marine Park
» nuclear actions (including uranium mining)
» a water resource, in relation to coal seam gas development and large coal mining development.

The EPBC Act comes into play when a proposal has the potential to have a significant impact on a matter of national environmental significance. This includes “the adoption or implementation of a plan for aviation airspace management involving aircraft operations that have, will have or are likely to have a significant impact on the environment”.

The Master Plan should include an assessment of whether the EPBC Act comes into play for any proposals in the plan.

6.4 State/Territory Government Legislation and Policy

The State / Territory Government regulatory and policy context will vary in each State / Territory but for all airports there is likely to be State or Territory Government legislation and policy of relevance to the airport and the Master Plan.

Of particular relevance will be any State / Territory legislation or policies relating to:

» Aviation (eg. State Aviation Strategy)
» Airports, airfields or heliports*
» Town planning and land use
» Environmental matters
» Cultural heritage

» Infrastructure provision
» Economic development

*For example, the State Planning Policy Framework which forms part of all Planning Schemes in Victoria contains policies relating to “Planning for Airports” and “Planning for Airfields”.

The Master Plan should outline any applicable State/ Territory Government legislation and policy and its affect on the planning of the airport.

6.5 Local Government Policies and Planning Controls

Local Government policies and planning controls will also be particularly relevant to the preparation of the Master Plan. This may include, for example:

» Urban growth and economic development strategies for the municipality
» Zoning controls that apply to the airport site and surrounding land
» Overlay controls that apply to the airport site (eg. environmental or heritage overlays)
» Policies or controls relating to particular matters such as urban design, utilities, landscaping etc.

The Master Plan should outline any applicable Local Government policies and planning controls and their affect on the planning of the airport. Any deficiencies and desirable changes to the policies and controls should be identified in the Master Plan and included as actions in the Implementation Plan.
7 CRITICAL AIRPORT PLANNING PARAMETERS

This section provides an outline of the critical airport planning parameters, or considerations, that will be central to any airport Master Plan.

7.1 Forecast of Future Operations

The first issue to be considered in planning an airport is the anticipated demand and scope of operations that are likely to evolve at the airport over the planning period and beyond. This requires forecasting and judgment based on an assessment of various factors in order to estimate future air traffic activities at the airport. This may comprise analysis of:

- historical aircraft and passenger movement data
- aircraft types currently using the airport
- origin and destination of aircraft currently using the airport
- global, national and regional aviation trends
- airline trends
- economic, social, tourism and population information

It can also involve benchmarking against other similar and/or larger airports which may provide a guide as to the possible future growth of activities at the airport in question.

Forecasting and benchmarking can help provide an estimate of essential planning information, particularly the likely aircraft and passenger movement activity to be accommodated over time.

More specifically, it can help determine such things as the likely future:

- numbers of aircraft and passengers movements
- aircraft types
- mix of operations (e.g. RPT, GA, charter, training)
- fleet mix (e.g. fixed/rotary wing, single/twin engine, jet/turbo-prop)
- timing of peak operations
- seasonality of operations
- origin and destination of aircraft/passengers
- approach procedures (non-instrument, non-precision, precision)
- security requirements

This information can then be used to determine the required capacity, or physical capability, of the airport facilities such as runway dimensions, navigational aid requirements, the magnitude of terminal development and car parking needs. It can also be used to determine the upper limits of acceptable delay to aircraft.

For small GA airports forecasting future aircraft movement activity can be a relatively simple process but for larger airports with RPT services it can be more complex. Several of the reference documents referred to in section 4 of this guideline provide guidance relating to forecasting, in particular the International Air Transport Association’s Airport Development Reference Manual and the International Civil Aviation Organisation’s Airport Planning Manual - Part 1: Master Planning.

7.2 Aerodrome Reference Code System

One of the most important elements of the CASA Manual of Standards Part 139 (MOS) is the Aerodrome Reference Code system. In this regard the MOS states:

Australia has adopted the International Civil Aviation Organisation (ICAO) methodology of using a code system, known as the Aerodrome Reference Code, to specify the standards for individual aerodrome facilities which are suitable for use by aeroplanes within a range of performances and sizes. The Code is composed of two elements: element 1 is a number related to the aeroplane reference field length; and element 2 is a letter related to the aeroplane wingspan and outer main gear wheel span. A particular specification is related to the more appropriate of the two elements of the Code or to an appropriate combination of the two Code elements. The Code letter or number within an element selected for design purposes is related to the critical aeroplane characteristics for which the facility is provided. There could be more than one critical aeroplane, as the critical aeroplane for a particular facility, such as a runway, may not be the critical aeroplane for another facility, such as the taxiway.
The MOS is the key document to be referred to when designing an airport/aerodrome and the Aerodrome Reference Code system forms a critical starting point for the design process.

The Aerodrome Reference Code is based on the characteristics of an aircraft not the airport. Once the critical aircraft (or design aircraft) is determined then the aerodrome facilities are designed and built to meet those characteristics.

The table below indicates the aircraft characteristics that determine the Aerodrome Reference Code.

The Code number for element 1 of the Aerodrome Reference Code is determined from column 1 of the above table. The Code number corresponding to the highest value of the aeroplane reference field lengths for which the runway is intended must be selected.

“Aeroplane reference field length” is defined in the MOS as:

_The minimum field length required for take-off at maximum certificated take-off mass, sea level, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate aeroplane flight manual prescribed by the certificating authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distance in other cases._

As noted in the MOS:

_The determination of the aeroplane reference field length is solely for the selection of a Code number and must not be confused with runway length requirements, which are influenced by other factors._

The Code letter for element 2 of the Aerodrome Reference Code is determined from column 3 of the above table. The Code letter, which corresponds to the greatest wingspan, or the greatest outer main gear wheel span, whichever gives the more demanding Code letter of the aeroplanes for which the facility is intended must be selected.

Unless otherwise agreed by CASA, aerodrome operators are required to maintain the airport’s runways and taxiways in accordance with the standards set out in the MOS applicable to the Aerodrome Reference Code for that runway or taxiway.

### TABLE 1: AERODROME REFERENCE CODE EXTRACTED FROM MOS PART 139 - AERODROMES

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<thead>
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<th>CODE ELEMENT 1</th>
<th>CODE ELEMENT 2</th>
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<tbody>
<tr>
<td>CODE NUMBER</td>
<td>AEROPLANE REFERENCE FIELD LENGTH (ARFL)</td>
</tr>
<tr>
<td>1</td>
<td>Less than 800m</td>
</tr>
<tr>
<td>2</td>
<td>800m up to but not including 1200m</td>
</tr>
<tr>
<td>3</td>
<td>1200m up to but not including 1800m</td>
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<td>4</td>
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<td>E</td>
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</table>
7.3 Design Aircraft

In order to establish the Aerodrome Reference Code for the airport in question, the design aircraft needs to be determined. The design aircraft is the synthesis of the key aircraft for which the airport is being designed to serve. In this regard, it is also necessary to consider the likely future aircraft types that may be introduced within the foreseeable future. Each class of aircraft is given a code letter.

Determining runway length, width and strength for an airport needs to be based on the critical aircraft that are likely to use the airport in the future. Usually this is based on RPT aircraft.

A number of aircraft are commonly used in the Australian aviation industry for small passenger operations and for corporate charter. The majority of passenger operations into regional centres on the eastern seaboard are serviced by turboprop aircraft with a seating capacity up to 70 passengers. The two most common aircraft are Dash 8 Q400 and SAAB 340, which are both Code C aircraft.

There are many types of corporate aircraft used in Australia. Typically, corporate aircraft operating in Australia are the Canadair Challenger 604 used by the RAAF to transport VIPs, the Cessna Citation, the Learjet or similar used by many businesses as charter aircraft.

Table 2 shows the characteristics of a range of typical aircraft for indicative purposes only. Specific values for particular aircraft should be obtained from the aircraft operator or the aircraft manufacturer.

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<th>AIRCRAFT</th>
<th>SEATS</th>
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<td>Dash 8 Q400</td>
<td>70</td>
<td>1354</td>
<td>29347</td>
<td>16.5</td>
<td>3C</td>
</tr>
<tr>
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<td>1440</td>
<td>6950</td>
<td>4.4</td>
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<tr>
<td>ATR 72-600</td>
<td>68</td>
<td>1165</td>
<td>21566</td>
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<td>70535</td>
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<tr>
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<td>180</td>
<td>2058</td>
<td>72000</td>
<td>40</td>
<td>4C</td>
</tr>
</tbody>
</table>

Note 1: For indicative purposes only. Specific values for particular aircraft should be obtained from the aircraft operator or the aircraft manufacturer. Note 2: ARFL = Aeroplane reference field length. Note 3: MTOW = Maximum take-off weight. Note 4: ACN = Aircraft Classification Number. The ACN is based on the aircraft’s maximum take-off weight on a flexible pavement with a sub-grade rating of “B”.

The largest types of aircraft currently operating worldwide are Code F aircraft. When planning a modern capital city, international airport it is appropriate to adopt the Code F design aircraft. However, for regional airports with existing or proposed RPT operations it is likely that a Code C design aircraft will suffice. It is noted that the Boeing 737 and Airbus A320 are both Code C aircraft.

It is also necessary to consider aircraft length, which is not part of the ICAO classification system, in order to establish a design aircraft envelope for planning purposes, particularly for planning apron areas. Over time many aircraft types have stretched in length to provide greater carrying capacity.

7.4 Navigation Systems

The navigation systems and approach procedures to be used at the airport are also an important consideration. This is because, under the MOS, certain standards vary depending upon whether the runway is a:

» Non-instrument runway;
» Instrument, non-precision approach runway; or
» Instrument, precision approach runway.

For example, under Section 6.2.18 of the MOS, the runway strip width requirements for a precision approach runway are greater than those for non-instrument and non-precision runways.
7.5 Aircraft Movement Area

The heart of any airport is the movement area, or airside area, comprising the runways, taxiways and aprons. Once all of the above matters have been assessed and considered it is then possible to design the movement area.

As discussed in section 7.1, forecasts should attempt to predict the number of aircraft movements, type of aircraft, nature of the traffic, and other criteria essential in determining the movement area requirements (eg. number, layout, and dimensions of runways, taxiways, and aprons). Runways, taxiways, and aprons consume large areas of land, and they also heavily influence off-airport land use planning restrictions. As a result, the runways and taxiways are the essential starting point for planning the airport layout. In other words, in designing an airport, the airfield layout should be done first.

The number, length and layout/orientation of the runways are the most important design issues at any airport. The number of runways will be determined by demand, capacity and delay considerations and the layout/orientation will largely be determined by prevailing wind conditions and nearby obstacles.

In relation to runway length, Section 6.2.2.1 of the MOS states “The length of a runway must be adequate to meet the operational requirements of the aeroplanes for which the runway is intended”. The operational requirements of aeroplanes may be determined by the aeroplane manufacturer, airlines or aeroplane operators, within the aeroplane mass and performance limitations set by CASA.

For a runway with a length of 1,800 metres and over, the ICAO Aerodrome Reference Code number is 4. When this is combined with the code letter corresponding to the design aircraft, as previously discussed, the complete Aerodrome Reference Code is obtained (eg. 4C). The purpose of the reference code is to provide a uniform approach for determining the clearance and design standards to be applied to aerodromes. With this code and with reference to the MOS, requirements for the movement area layout can be determined.

For smaller aircraft engaged in domestic and regional RPT operations (eg. Dash 8 Q400 and SAAB 340) a Code 3 runway is likely to be required.

The Aeroplane Reference Field Length (ARFL) published by aircraft manufacturers for each aircraft type is a guide only when determining suitable runway length; many other factors can also influence usable runway length including air temperature, runway slope and elevation. In practice, a longer runway length is usually required.

The width of the runway and the runway strip width are also limiting factors that can restrict aircraft operations. Requirements relating to these and other important aspects of the movement area (eg. Runway End Safety Areas) are contained in chapter 6 of the MOS. Important requirements relating to movement area lighting are contained in chapter 9 of the MOS.

7.6 Pavement Strength

The movement area pavement strength can also be a major limiting factor for aircraft operations. The construction materials used and the constructed depth of the pavements determine pavement strength. For a pavement to be determined suitable for an aircraft operation the designated Pavement Classification Number (PCN) should match the Aircraft Classification Number (ACN) which is determined by the aircraft manufacturer. When the ACN of the aircraft is greater than the PCN of the pavement, the pavement is being overloaded.

Section 6.2.10.2 of the MOS states that “CASA does not specify a standard for runway bearing strength, however, the bearing strength must be such that it will not cause any safety problems to aircraft. The published PCN value should be suitable for the aircraft that regularly use the airport”.

Moreover, the CASA website states:

Aerodromes operating under CASR Part 139 are to have movement area pavements which can safely support aircraft intended to operate on them. Apart from ensuring the surface of pavements are cleaned of debris and stone, which have the potential to cause foreign object damage to aircraft, and the surface has good friction characteristics, there are no standards required for the design and maintenance of pavements. The aerodrome operator is expected to have in place a pavement management system which will ensure the continued structural integrity of pavements.
The strength of runway pavements is required to be reported in Airservices’ Aeronautical Information Publication (AIP) – En Route Supplement Australia (ERSA). The strength must be reported using the ICAO adopted ACN-PCN pavement strength rating system. What needs to be reported and published in AIP ERSA is specified in the MOS, but there is no explanation given on how to determine the ACN of an aircraft or the PCN of a pavement.

However, CASA has produced an Advisory Circular which provides guidance relating to these matters. Advisory Circular AC 139-25(0): Strength Rating of Aerodrome Pavements (August 2011) can be downloaded from the CASA website. The AAA’s Pavement Concession Calculator can also be of assistance in assessing the possible effect of aircraft operations on aerodrome pavements.

7.7 Aviation Support and Landside Facilities

Whilst the movement area design should be done first, it should not be done in isolation. The critical aviation support and landside facilities also need to be considered. These support facilities include:

» control tower
» navigation aids
» aerodrome lighting
» meteorological facilities
» passenger terminals
» aircraft hangars
» cargo facilities
» rescue and fire fighting facilities
» fuel facilities
» access roads and car parks

The design of new (or changes to existing) runways, taxiways and aprons should consider the existing aviation support and landside facilities on the airport site. Likewise, the provision of new support facilities needs to be planned having regard to the design and capacity of the movement area, as well as the forecast growth of aviation activities. Each aviation support and landside facility will have particular requirements and they should be sited in an appropriate location for aircraft operations and airport user needs.

The following standards will be applicable to planning aviation support facilities on the airport:

» MOS Part 139 section 11.1 which specifies standards for siting and clearance areas for airways facilities on airports (ie. navigation aids, communication facilities, meteorological facilities and ATC facilities)
» MOS Part 139 chapter 9 which contains detailed requirements for “visual aids provided by aerodrome lighting”
» MOS Part 139H which specifies standards applicable to the provision of Aerodrome Rescue and Fire Fighting Services
» MOS Part 172 which specifies standards for designing and siting air traffic control towers

In relation to airways facilities, section 11.1.4.2 of the MOS Part 139 states:

The general requirements for airways facilities are a finite site for their physical installation, i.e. shelters, foundations, towers, antennae plus a reasonable service area around the physical features. In many instances, there is also a requirement for a clearance zone around this space, in some instances relatively extensive, for the purpose of ensuring transmission of electromagnetic waves without interference from extraneous sources, or for the purpose of unimpeded vision in the cases of ATC towers or RFFS stations.

It should be noted the Global Positioning System (GPS) is increasingly being used as an aviation navigation aid and has the capability to provide both en route and terminal area navigation assistance to aircraft. In time, GPS may reduce the need for some current ground based navigation aids.

The planning standards for some support facilities, particularly landside facilities such as access roads and car parks, are less defined and regulated when compared to the airside facilities. The need for and size of landside facilities will generally be determined by demand factors including the growth forecasts and airport user needs.
Where changes to or expansion of an airport’s aviation support or landside facilities is envisaged, the Master Plan should include conceptual details of where and how this is proposed. For example, if it is envisaged that new aircraft hangars will be needed in the future, the Master Plan should include a concept plan showing where this is proposed to occur, ideally with a schematic layout of the hangars and the taxiways/taxilanes and roads that will provide access to them by aircraft and vehicles. In preparing such a plan, the MOS requirements relating to offsets from runways and taxiways, and the airspace surfaces must be considered. The potential for building induced windshear and turbulence should also be considered in accordance with NASF Guideline B.

7.8 Passenger Terminal

After the airside or movement area, the passenger terminal zone is the most important facility and one of the principle elements of capital cost at an airport with RPT services.

An airport’s passenger terminal acts as the interface between the airside and landside functions of the airport. It is also the point at which people transfer between air and land transport modes. In so doing, the terminal must accommodate a range of facilities to process the passengers and make their time in the terminal as pleasant as possible. As such, the terminal is critical to the passengers’ evaluation and perception of the level of service provided by the airport.

Designing a passenger terminal therefore requires careful planning and forethought, in order to ensure that the terminal facilities are of the right capacity and provide a suitable level of service for the anticipated passenger traffic. This is particularly important for larger airports where significant numbers of people will use the facilities in the terminal on a daily basis.

An airport Master Plan would not normally include detailed design of new terminal facilities. For new terminal facilities, whether it be a totally new terminal or expansion of an existing terminal, the level of detail in an airport Master Plan would normally be limited to conceptual layouts or schematic drawings delineating general location, overall area, and perhaps the basic configuration of the terminal’s floor plan.

The primary purpose is to protect an appropriate amount of space (land area) for the terminal works to be constructed in the future.

There are a range of facilities that are usually provided in an airport passenger terminal:

- Landside interface facilities
- Passenger processing areas (including security screening)
- Passenger holding areas (including commercial facilities)
- Internal circulation
- Airside interface facilities
- Airline and support areas

Once the required terminal facilities have been determined it is then necessary to calculate the space requirements for each functional area. This is basically a three step process:

1. Estimate passenger demand levels: The aim of this first task in the planning process is to determine the overall design load for the terminal at peak periods. This will be based on the growth forecasts as discussed in section 7.1.

2. Estimate demand for particular facilities: Once the overall design load is determined, it is then necessary to calculate the load on each individual facility, such as the check-in area, the baggage claim area and the waiting areas.

3. Determine space requirements: The actual floor area requirements are then calculated by multiplying the estimated number of passengers using each facility with an empirical factor to arrive at the approximate area or capacity of the facility required. The empirical factor or constant is usually based upon “level of service” standards derived from experience acquired at airports around the world. Based on the number of passengers processed in each facility, areas can be computed so that reasonable levels of service can be provided.

Space standards or guidelines for passenger terminals have been prepared by bodies such as the IATA and the FAA. However, there is no single, all-encompassing rulebook for the detailed design of passenger terminals.
IATA has published a set of space design standards based on the level of service concept, where different amounts of space are recommended for certain terminal areas depending upon the level of service proposed. The IATA Airport Development Reference Manual provides more extensive and detailed standards for the full range of terminal facilities. However, these standards are based on (often complex) Capacity Calculation Formulae that are used to calculate each individual area or number of specific facilities in a terminal.

The FAA has also developed a set of specific recommendations on spatial provision for the various functions and facilities accommodated in an airport passenger terminal. These are set out in the FAA Advisory Circular 150/5360-13 – Planning and Design Guidelines for Airport Terminal Facilities.

The FAA Advisory Circular also contains a “rule-of-thumb” recommendation of 14m² of gross terminal building area per design peak-hour passenger for a domestic terminal which “is sometimes used for rough estimating purposes”. In addition to the rule-of-thumb, the FAA Advisory Circular also provides guidance about how the gross area is generally allocated to different functions in the terminal.

The FAA gross terminal area rule-of-thumb and distribution guidelines provide a simple but accepted tool for estimating the space requirements for terminals and may be appropriate when estimating future terminal requirements as part of an airport Master Plan.

In planning a passenger terminal, the identification of opportunities for income generating floor space, such as bars, restaurants and shops, should not be overlooked, and is essential for passenger amenity.

7.9 Security Requirements

In planning an airport, and passenger terminal facilities in particular, the requirements of the Aviation Transport Security Act 2004 and Aviation Transport Security Regulations 2005 must be considered.

In relation to this legislation, the AAA’s report Australia’s Regional Airport’s – Facts, Myths & Challenges, states:

The Aviation Transport Security Act 2004 and Aviation Transport Security Regulations 2005 require aviation industry participants to operate an approved Transport Security Program. The Act allows the Secretary to designate airports as security controlled airports, to assign categories to them, and to establish airside and landside areas, security zones and event zones for those airports. Once established, the areas and zones are subject to requirements directed at safeguarding against unlawful interference with aviation and the airport operator is required to have and comply with a Transport Security Program approved by the Secretary of the Department.

The designation and categorisation of an airport under the Act, and the nature of the aviation services undertaken by aircraft operators and air cargo agents at the airport dictate the nature of the particular security measures that must be put in place at the airport.

Preparing a transport security plan and installing and operating security equipment and procedures is inherently challenging and expensive.

Again it is the case that, whenever an airline proposes to change the nature of the air services it provides to and from a particular airport, this has the potential to change the security designation/categorisation of the airport and move it into a more tightly regulated situation. There may be considerable expense and effort required for an airport to meet the increased regulatory burden so that it can agree to meet the airline’s proposal, and yet the airline will generally not be prepared to undertake to maintain the new air services that necessitate that expense and effort on an ongoing basis.

It is noted that passenger screening is only required for RPT and open charter aircraft greater than 20,000kg MTOW.

These security requirements are important considerations for an airport Master Plan.
7.10 Airspace Protection Surfaces

International standards have been adopted which define two sets of invisible surfaces above the ground around an airport. The airspace above these surfaces forms the airport’s protected airspace. These two surfaces are the:

» Obstacle Limitation Surface (OLS); and
» Procedures for Air Navigational Services—Aircraft Operations (PANS-OPS) surface

The OLS is generally the lowest surface and is designed to provide protection for aircraft flying into or out of the airport when the pilot is flying by sight. The PANS-OPS surface is generally above the OLS and is designed to safeguard an aircraft from collision with obstacles when the aircraft’s flight may be guided solely by instruments, in conditions of poor visibility.

Airspace protection is critically important for all airports, particularly protection of the airport’s Obstacle Limitation Surfaces.

The MOS defines Obstacle Limitation Surfaces (OLS) as:

A series of planes associated with each runway at an aerodrome that defines the desirable limits to which objects may project into the airspace around the aerodrome so that aircraft operations at the aerodrome may be conducted safely.

The physical dimensions of the OLS surfaces must be determined using Tables 7.1-1 and 7.1-2 in the MOS and are based on the Aerodrome Reference Code number for each runway. PANS-OPS surfaces are generally determined by the instrument flight procedure designer.

Charts of the OLS and PANS-OPS surfaces should be prepared. These should be included in the airport Master Plan.

The airspace protection surfaces are critical for airport safeguarding purposes, in relation to both on-airport and off-airport development.

Within the airport site the airspace protection surfaces are particularly relevant for the development of landside facilities and will influence the location and height of future development on the site. Limiting the height of development close to the runway(s) is critical and this should be addressed in the Master Plan.

Future development areas on the airport, particularly close to the runways, should have a maximum building height restriction applied in the Master Plan to ensure that buildings and other structures do not intrude into the applicable airspace surfaces. The height of development further away from the runway(s) may increase in accordance with the applicable surfaces.

Outside the airport site, appropriate airspace protection planning controls should be in place. If such controls are not already in place the Master Plan should recommend that the relevant State/Territory or Local Government authorities introduce such controls based on the applicable airspace surfaces, as discussed in the National Airports Safeguarding Framework, Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports.

7.11 Aircraft Noise Contours

The assessment of aircraft noise effects is an important consideration in the development of an airport Master Plan. It aims to ensure that:

» Sensitive land uses are not located in areas of unacceptable aircraft noise;
» The amenity of surrounding developments is not adversely affected by aircraft noise; and
» Airport operations are protected long term from conflicts due to the encroachment of inappropriate development into noise affected areas.

An Australian Noise Exposure Forecast (ANEF) is a contour map showing the forecast of aircraft noise levels that are expected to exist around an airport in the future.

Recommendations relating to land use within the ANEF contours are contained in Australian Standard AS2021-2000 “Acoustics – Aircraft Noise Intrusion – Building Siting and Construction”. These recommendations are summarised in Table 3 below. This is a summary only; airport operators should consult the Australian Standard for full details of the land use recommendations, and associated notes and conditions. It should also be noted that, at the time of writing, AS2021 was being reviewed by Standards Australia and it is likely that a revised standard will be released in due course.
An airport Master Plan should include an ANEF chart along with a discussion of its implications for land use on the airport site and on surrounding land. Outside the airport site appropriate planning controls should be in place based on AS2021. If such controls are not already in place the Master Plan should recommend that the relevant State/Territory or Local Government authorities introduce such controls, as discussed in the National Airports Safeguarding Framework (NASF), Guideline A: Measures for Managing Impacts of Aircraft Noise.

NASF Guideline A contains further information and recommendations regarding aircraft noise contours which should be considered by airport operators. This includes the use of the “Number Above” noise metric (commonly referred to as N-contours) to supplement the ANEF.

The N-contour system is a complementary aircraft noise metric that shows the potential number of aircraft noise events above 60dB(A), 65dB(A) or 70dB(A) per day. It has advantages over the ANEF system because it shows noise in a way that a person perceives it – as a number single events per day above a certain decibel level.

The N-contours system is not a new concept, but due to the limitations of the ANEF system and with the introduction of NASF Guideline A, it is increasingly being used by airports to assist in displaying and explaining the aircraft noise effects of aircraft operations.

7.12 Environmental and Heritage Sites

Many airport sites have environmental and/or heritage constraints that need to be understood and taken into account when preparing a Master Plan. In some cases it may not be possible to develop certain areas of the site where there are environmental or heritage values, or there may be specific requirements that need to be met before such areas can be developed.

The first task when developing a Master Plan is to understand what constraints there are on the airport site. This may have been identified in the initial SWOT analysis. In some cases specialist studies may be required to confirm the existence and significance of any environmental or heritage assets. Sites or areas protected under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 particularly need to be identified, along with any areas protected under State/Territory and local regulations.

Once any significant environmental or heritage sites have been identified they should be mapped and included in the Master Plan. There should also be a discussion in the Master Plan about the implications of the sites for future development on the airport, including any further investigations or approvals that may be required before development can proceed.
8 STAKEHOLDER CONSULTATION AND ENGAGEMENT

Stakeholder consultation and engagement is an important part of the airport master planning process. This section will briefly outline some of the key consultation issues to consider when developing an airport Master Plan work programme.

It does not seek to provide an exhaustive list of matters that should be taken into account, nor dictate the types of consultation that should be undertaken. Each airport is different and the consultation required in each case should be tailored to the particular circumstances and stakeholders.

The Australian Government has published Airport Development Consultation Guidelines (October 2012) which provide some valuable guidance. Whilst these guidelines relate to Commonwealth-leased airports controlled under the Airports Act 1996, they still provide some useful information relating to airport development consultation which all airports should consider when embarking upon an airport Master Plan project.

8.1 Consultation Plan

A project specific Consultation Plan should be prepared for the Master Plan. As stated in the Australian Government’s guidelines referred to above:

Simply distributing information without regard for the complexities and uncertainties of the issues does not ensure effective consultation and communication. A well considered and clearly articulated consultation plan will help ensure that messages and actions are constructively formulated, communicated and received. It may involve targeted approaches to key stakeholders as well as public engagement.

The Consultation Plan should address:

- Purpose of consultation
- Who to consult
- Consultation methods
- When to consult
- Key issues and messages

8.2 Key Stakeholders

Stakeholders in relation to airport planning and development can be many and varied and include the following groups:

- Australian Government agencies (particularly CASA, Airservices and the Office of Transport Security)
- State Government agencies
- Local Government
- Elected representatives
- Adjoining and nearby land owners and residents
- Community groups
- General public
- Industry (particularly airport-based businesses and businesses likely to generate future airport activity)
- Infrastructure providers and utility companies
- Media

As part of the development of the Consultation Plan the key stakeholders should be identified early. The consultation approach or strategy for each stakeholder group can then be determined and addressed in the Plan.

8.3 Consultation Approaches

There is a range of consultation approaches that may be used in order to achieve effective dialogue with affected stakeholders during the master planning process.

The Australian Government’s guidelines document contains a list of several possible consultation approaches or techniques:

1. public meetings – formalised proceedings aimed at presenting information to a large audience. These are highly visible and can be effective in enabling a wide range of views to be aired. There is a need to ensure that those who are most confident in putting their views across do not dominate the meeting, thereby discouraging interaction. Appointment of an experienced and respected chairperson/facilitator (including the use of independent chairpersons), coupled with suitable venues and at suitable times, may help ensure an effective exchange of information.
2 stakeholder meeting – meetings with groups/individuals who share a common interest, where specific issues of concern can be discussed in more detail than at public meetings.

3 focus group meetings – could bring together, in an informal atmosphere, people from diverse areas to help identify and analyse issues of concerns.

4 on-site meetings – enables interested individuals to gain a more practical understanding of the issues involved, and may also include visits to see a similar operation in practice.

5 permanent or ad hoc consultative committees – provides on-going advice and feedback on proposals and could be utilised as a liaison/public relations tool.

6 submissions – preferably written (to avoid misrepresentation), to enable stakeholders to register their views and concerns.

7 individual discussions – provides a quick and efficient means of disseminating and receiving information, but limits the spread of information.

The Australian Government’s guidelines also states that effective communication can also be facilitated by:

8 identifying source materials that are referred to and provide access to those documents – for example, technical studies or reports such as economic impact statements and road traffic studies;

9 using the media to disseminate information;

10 providing additional information by way of newsletters, pamphlets, videos or through the internet;

11 exhibiting information at the airport passenger terminal(s) as well as in off-airport public buildings such as shopping centres and local libraries; and

12 acknowledging receipt of individual and specific submissions, as opposed to the ‘form letter’ response.

The choice of techniques will depend on a number of factors including the location of the airport, the nature of the key stakeholders and the likely impact that airport development may have on those stakeholders. It may be necessary to tailor techniques and messages to individual stakeholders or stakeholder groups.

8.4 Timing of Consultation

The consultation process should start early and continue throughout the preparation of the Master Plan. However, the timing of consultation activities will vary depending on the stage in the planning process and the stakeholders concerned. It is usually appropriate to initiate discussions with key government agencies early before entering into consultation with the community.

In relation to the Master Plan process outlined in section 5 of this guideline, consultation with key stakeholders (particularly with airport-based businesses and tenants) may occur as follows:

» Stage 1: Consultation regarding the SWOT Analysis

» Stage 2: Consultation regarding the vision for the airport and future direction

» Stage 3: Consultation regarding draft development concepts

Formal public exhibition of the Draft Master Plan and receipt of written submissions/comments may also be considered at the end of the process, but this should not be seen as a substitute for consulting and involving stakeholders earlier during development of the Master Plan.
9 KEY ELEMENTS OF THE PLAN

This section briefly outlines what may be considered the key elements of a Regional Airport Master Plan. Once again, this is not intended to be prescriptive.

9.1 Strategic Vision and Objectives

As stated in section 5.2 of this guideline, the Master Plan should clearly articulate the strategic vision and goals/objectives for the airport. These should be developed in consultation with key stakeholders.

9.2 Land Use Plan

A Land Use Plan identifying the airport’s different land use precincts or zones should form the basis of the Master Plan. Each of the land use precincts shown on the plan will have different characteristics and objectives which should be outlined in the Master Plan.

As an example, the airport site may be divided into land use precincts such as:
- Airside precinct
- Terminal precinct
- Hangar precinct
- Non-aviation development precinct
- Environmental protection precinct

The number and type of precincts will depend on site specific circumstances.

Land use guidelines for each precinct should be development specifying:
- Key issues and objectives
- Appropriate land uses
- Inappropriate or prohibited land uses

The use and development of the airport land should be consistent with the Land Use Plan and the precinct guidelines. This is one of the fundamental purposes of any airport Master Plan.

9.3 Facilities Development Plan

The Facilities Development Plan is perhaps the most important part of the Master Plan as it relates to the development of the airport’s physical facilities and infrastructure, particularly the airfield facilities.

This section of the Master Plan should discuss the plan for the future development of the airport’s physical facilities and infrastructure over the planning period. This will be based on the outcomes of stages 1 and 2 of the planning process as discussed in section 5, particularly the assessment of the existing facilities and analysis of the critical airport planning parameters. These investigations are likely to result in the requirement to upgrade existing or construct new facilities in the future to accommodate forecast growth.

This element of the Master Plan may cover proposed new or changes to existing facilities or infrastructure such as:
- Runways, taxiways, aprons
- Terminal facilities
- Hangar facilities
- Helicopter facilities
- Emergency services facilities
- Ground access and car parking facilities (see also section 9.4 below)
- Navigation aids
- Fuel facilities
- Utility services and drainage
An airport Master Plan would not normally include detailed design of the new facilities. The level of detail in an airport Master Plan would normally be limited to conceptual layouts or schematic drawings delineating general location, overall area, and perhaps the basic configuration of the facility. The primary purpose is to plan for the future provision of the facilities and protect an appropriate area of land for the facilities to be constructed when required.

However, in some cases there may be a need for some preliminary design to be undertaken to prove concepts and/or to provide a basis for cost estimates where required.

In developing this plan, consideration of the MOS requirements is essential, particularly protection of existing and possible future runway and taxiway strips and airspace surfaces.

9.4 Ground Transport Plan

The purpose of a Ground Transport Plan (GTP) is to outline how it is proposed to maximise the efficient movement of people (employees, passengers and other airport users) and freight at the airport. A GTP is now a mandatory element of Master Plans relating to Commonwealth-leased airports controlled under the Airports Act 1996. For other airports this is an optional element, but one that may be appropriate for busy airports that generate significant vehicle movements.

By way of example, the Airports Act requires a GTP to include details of:

1. road network plan; and
2. facilities for moving people (including passengers, employees and other airport users) and freight at the airport (these facilities would include the airport’s road infrastructure, road connections, car parking facilities, public transport services, and facilities for taxis and private coach or shuttle services); and
3. linkages between the road network and public transport system at the airport and the road network and public transport system outside the airport; and
4. the arrangements for working with State or local authorities or other bodies responsible for the road network and ground transport system (‘Other bodies’ may include private companies operating public transport services connecting the airport to off-airport transport system); and
5. the capacity of the ground transport system to support airport operations and other airport activities; and
6. the likely effect of the proposed developments set out in the master plan on the ground transport system and traffic flows at and surrounding the airport.

The GTP should be prepared with regard to the airport’s development proposals and in particular should address any transport network upgrades or changes required to meet the pattern of developments proposed over the Master Plan period.

9.5 Environmental Management Plan

An Environmental Management Plan (or the like) may be required if there are significant environmental values on the airport site, as discussed in section 7.12.

The content of this section would depend on the nature of the environmental values and whether they are likely to be impacted by proposed future development. A specialist study may be required to inform this part of the Master Plan, and due to seasonal issues may take a considerable period of time to complete.

A detailed Environmental Management Plan like one would prepare in association with a construction project is not required for a Master Plan, but as a minimum the Master Plan should address:

» Identification of sites of environmental significance on the airport site
» Significance of the sites
» Regulatory requirements relating to the sites including approval requirements
» Any further investigations required
» Implications for future development on the site
» How the sites will be managed
If required, the Environmental Management Plan may also address issues such as:

» Ecologically Sustainable Development
» Hazardous materials management
» Water quality management

9.6 Heritage Management Plan

Like the environmental plan, a Heritage Management Plan (or the like) is optional but may be required if there are significant heritage sites on the airport. This applies to Aboriginal and historic (or post-contact) cultural heritage.

If there are important heritage sites on the airport the Master Plan should include a discussion of the following matters:

» Identification of sites of heritage significance on the airport site
» Significance of the sites
» Regulatory requirements relating to the sites including approval requirements
» Any further investigations required
» Implications for future development on the site
» How the sites will be managed

The issue of native title may also need to be considered.

9.7 Airport Safeguarding Plan

The purpose of an Airport Safeguarding Plan is to address the off-airport planning objectives outlined earlier in section 3.2. A safeguarding plan should be seen as an essential component of any airport Master Plan.

This section of the Master Plan should discuss:

» The National Airports Safeguarding Framework principles and guidelines – as discussed in section 6.2 of this guideline
» The airport’s airspace protection surfaces – as discussed in section 7.10
» The airport’s Australian Noise Exposure Forecast and the Australian Standard AS2021-2000, plus the airport’s N-contours (if they exist) – as discussed in section 7.11
» Planning policies and controls protecting the airport (if any)

Outside the airport site, appropriate planning controls should be in place to protect the ongoing operation of the airport. If such controls are not already in place the Master Plan should recommend that the relevant State/Territory or Local Government authorities introduce such controls based on the National Airports Safeguarding Framework (NASF) guidelines. It is noted that NASF was agreed to by Commonwealth, State and Territory Ministers at the Standing Council on Transport and Infrastructure (SCOTI) meeting on 18 May 2012.

NASF has raised the airport safeguarding bar in Australia but in some cases State/Territory and local government planning systems are lagging behind the guidelines.
9.8 Implementation Plan

This section of the Master Plan will be the outcome of stage 4 of the planning process discussed in section 5.4. This requires the development of an Implementation Plan which should include:

» Identification of specific actions required to implement the plan
» Trigger points for each action
» Broad indication of likely timing for each action

This may be set out in the form of a table like the one below.

<table>
<thead>
<tr>
<th>ACTION</th>
<th>TRIGGER POINT</th>
<th>INDICATIVE TIMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release of final Master Plan</td>
<td>Council adoption of the Master Plan</td>
<td>Immediately upon adoption by Council</td>
</tr>
<tr>
<td>Discuss improvements to off-airport planning controls with State Government</td>
<td>Council adoption of the Master Plan</td>
<td>6 months</td>
</tr>
<tr>
<td>Construction of a new car park</td>
<td>When vehicle movements reach X per day</td>
<td>1 year</td>
</tr>
<tr>
<td>Upgrade fuel facility</td>
<td>When aircraft movements reach X per month</td>
<td>1-2 years</td>
</tr>
<tr>
<td>Construction of new entry and access road into the airport</td>
<td>When vehicle movements reach X per day</td>
<td>2 years</td>
</tr>
<tr>
<td>Extend Taxiway X</td>
<td>When aircraft movements reach X per year</td>
<td>3 years</td>
</tr>
<tr>
<td>Review Master Plan</td>
<td>Significant change in circumstances or after 5 years</td>
<td>5 years</td>
</tr>
</tbody>
</table>

A staging plan may also be included to show, for example, the sequencing of major infrastructure upgrades such as runway or taxiway improvements.

Cost estimates for key projects, and possible funding sources, may also be outlined in the Implementation Plan.

As noted in the above table, airport Master Plans should be reviewed at least every 5 years to ensure they kept are up-to-date and accurate.
10 CONCLUSION

The design and layout of an airport involves the assessment and consideration of a range of complex issues, including future demand, rules and standards, current and future aircraft types, surrounding land use, climate and topography. These considerations, and others outlined in this guideline, are critical to the safe and efficient design and operation of an airport, whether it be a small regional airport or a large international airport.

Airport operators or airport planners need to allow time to undertake this planning process comprehensively and diligently. In so doing, adequate time needs to be allowed for consultation with key stakeholders who have an interest in the airport or its operations. It is particularly important that the Master Plan is aligned with government policy to ensure that the plan receives government support and to maximise the ability for it to be implemented over time.

After taking all of these considerations into account and applying them to the design of an airport, a robust Master Plan can be produced to guide the future development of the airport, protect its ongoing operations and realise the economic and social benefits that regional airports can provide to their communities.
PART B: TEMPLATE FOR A REGIONAL AIRPORT MASTER PLAN
1 INTRODUCTION

1.1 Overview of the Airport
Short description of the airport and its location.

1.2 Purpose and Objectives of the Master Plan
Outline the purpose and objectives of the Master Plan.

1.3 Methodology and Consultation
Describe the process followed to develop the Master Plan and outline the consultation undertaken.

1.4 Report Structure
Outline the report structure. Two parts, background information and then the Master Plan.
2 BACKGROUND INFORMATION

2.1 Master Plan Context
Sets the scene for the Master Plan.

2.1.1 Historical Background
Describe the airport’s history, such as how long it has been operating and how it has developed or changed over time.

2.1.2 Regional Context
Describe the regional context, such as the characteristics of the region that the airport is located in and the role the airport plays in the region. Is it the only airport in the region? Is it a remote regional location heavily reliant on the airport?

2.1.3 Socio-Economic Context
Describe the socio-economic situation in the region, such as the population characteristics and growth forecasts, employment situation and main industries. Include a discussion about the importance of the airport to the region. Refer to Part A, section 2 of this guideline.

2.1.4 Regulatory Context
Discuss the regulatory context – refer to Part A, section 6 of this guideline. Particular reference should be made to the MOS.

2.1.5 Policy Context
Discuss the policy context – refer to Part A, section 6 of this guideline.

2.1.6 Previous and Current Master Plans
Discuss any previous or current plans relating to the airport.

2.1.7 Key Stakeholders
Discuss the key airport stakeholders and outcomes of consultation with those stakeholders.

2.2 Current Situation
Sets out the current situation, i.e. where are we now?

2.2.1 Ownership and Management
Describe the ownership and management of the airport.

2.2.2 Site Description
Describe the airport site eg. location, boundaries, area, topography.

2.2.3 Surrounding Land
Describe the land surrounding the airport, particularly the existing land use and development around the airport. Identify any issues or constraints.

2.2.4 Existing Activities
Describe the existing aviation and non-aviation activities on the airport site.

2.2.5 Existing Facilities
Describe the existing facilities on the airport site eg. runways, taxiways, aprons, hangars, navigation aids etc. Identify any issues or constraints.

2.2.6 Ground Transport Access
Describe the ground transport access arrangements at the airport including provision for car parking. Identify any issues or constraints.

2.2.7 Utility Services
Discuss the existing provision of utility services. Identify any issues or constraints.

2.2.8 Environmental Values
Describe any environmental values on the airport site. Identify any issues or constraints.

2.2.9 Heritage Values
Describe any heritage values on the airport site. Identify any issues or constraints.
2.3 **SWOT Analysis**
Discuss the outcomes of the SWOT analysis.

2.3.1 **Strengths and Advantages**
What are the airport’s strengths and what advantages does it have?

2.3.2 **Weaknesses and Constraints**
What are the airport’s weaknesses and what constraints are there?

2.3.3 **Opportunities and Prospects**
What opportunities or prospects exist in terms of future airport development?

2.3.4 **Threats and Risks**
Are there any known threats or risks that may affect the airport in the future?

2.3.5 **Summary of SWOT Analysis**
Discuss the key outcomes of the SWOT analysis.

2.4 **Strategic Vision and Objectives**
The following vision statement and objectives provide broad guidance and direction for the development of the airport. The development of the vision and objectives was guided by the master plan context discussed in section 2, and the SWOT analysis discussed in section 4 as well as discussions with key stakeholders.

2.4.1 **Strategic Vision**
The vision for airport is:
*Insert vision or mission statement.*

2.4.2 **Objectives**
The objectives for the airport are:
*Insert objectives for the airport.*

2.5 **Critical Airport Planning Parameters**
Refer to Part A, section 7 of this guideline.

2.5.1 **Forecast of Future Operations**
Discuss the forecast of future operations. Refer to Part A, section 7.1 of this guideline.

2.5.2 **Aerodrome Reference Code System**
Discuss the Aerodrome Reference Code system and how it relates to the existing airport facilities.

2.5.3 **Selected Design Aircraft**
Discuss the selected design aircraft and what it means in terms of the airport’s existing and future facilities.

2.5.4 **Navigation Systems**
Discuss the existing navigation systems at the airport. Are the existing systems likely to be upgraded in the future and if so what are the implications?

2.5.5 **Aircraft Movement Area**
Discuss the existing movement area facilities and future upgrades required based on the growth forecasts, design aircraft and MOS requirements. Will changes to the existing airfield facilities be required, and if so what will they entail?

2.5.6 **Pavement Strength**
Discuss the existing pavement strength rating(s) and whether upgrades are likely to be required based on the growth forecasts, design aircraft and PCN / ACN system.

2.5.7 **Aviation Support and Landside Facilities**
Discuss the existing aviation support and landside facilities and changes required to accommodate forecast demand.

2.5.8 **Passenger Terminal**
Discuss the existing (if any) terminal facilities and changes required to accommodate forecast demand. If there is no existing terminal but investigations suggest that one will or may be required in the future, discuss the reasons and approximate size requirements.

2.5.9 **Security Requirements**
Discuss any new or changed security requirements that will need to be met.

2.5.10 **Airspace Protection Surfaces**
Discuss the existing OLS and PANS-OPS surfaces and any changes required due to facility upgrades (eg. lengthening of runways). A chart showing the ultimate OLS and PANS-OPS surfaces should be included in the Master Plan.

2.5.11 **Aircraft Noise Contours**
Discuss the ANEF and Australian Standard AS2021-2000. An ANEF chart, endorsed by Airservices, should be included. Also discuss the airport’s N-contours (if they exist).

2.5.12 **Environmental and Heritage Sites**
Discuss requirements relating to any environmental or heritage sites.
3 AIRPORT MASTER PLAN

3.1 Land Use Plan
Refer to Part A, section 9.2 of this guideline.

3.1.1 Land Use Precincts
Outline the airport’s different land use precincts.
Include a plan showing the different land use precincts.

3.1.2 Land Use Precinct Guidelines
Land use guidelines for each precinct.
Include discussion of the State/Local government planning controls applying to the airport site.

3.2 Facilities Development Plan
Discuss the plan for the future development of the airport’s physical facilities and infrastructure over the planning period. Refer to Part A, section 9.3 of this guideline.
Include a plan showing key airport facility proposals.

3.2.1 Movement Area Facilities
- Runways
- Taxiways, taxilanes
- Aprons, aircraft parking areas
- Pavement strength
- Lighting

3.2.2 Aviation Support Facilities
- Passenger terminal
- Fuel facilities
- Aircraft hangars
- Navigation aids
- Meteorological facilities

3.2.3 Other Facilities
- Access roads
- Car parks
- Non-aviation / commercial development
- Utility services
- Drainage

3.3 Ground Transport Plan
Optional, but may be appropriate for busy airports that generate significant vehicle movements. Refer to Part A, section 9.4 of this guideline.

3.4 Environmental Management Plan
Optional, but should be included if the airport site contains significant environmental values. Refer to Part A, section 9.5 of this guideline.
Include a plan showing key environmental sites.

3.5 Heritage Management Plan
Optional, but should be included if the airport site contains significant heritage values. Refer to Part A, section 9.6 of this guideline.
Include a plan showing key heritage sites.

3.6 Airport Safeguarding Plan
Refer to Part A, section 9.7 of this guideline.

3.6.1 National Airports Safeguarding Framework
Discuss the National Airports Safeguarding Framework principles and guidelines.

3.6.2 Airspace Protection Surfaces
Discuss the airport’s airspace protection surfaces and the need for off-airport development to comply with these surfaces.

3.6.3 Aircraft Noise Contours
Discuss the airport’s Australian Noise Exposure Forecast and Australian Standard AS2021-2000 and the need for off-airport land use to comply with the standard.
Discuss the airport’s N-contours (if they exist).
3.6.4 Planning Policies and Controls
Discuss any existing planning policies and controls relating to safeguarding of the airport. If such controls are not already in place the Master Plan should recommend that the relevant State/Territory or Local Government authorities introduce such controls based on the National Airports Safeguarding Framework (NASF) guidelines.

3.7 Implementation Plan
Identification of specific actions required to implement the plan, trigger points for each action and broad indication of likely timing. Cost estimates for key projects, and possible funding sources, may also be outlined in the Implementation Plan. Refer to Part A, section 9.8 of this guideline.

This template is only a guide and can be tailored as required to suit the needs of individual airports. It is not intended to be prescriptive, nor provide an exhaustive list of the matters that should be included. Some sections and sub-sections are optional. It is acknowledged that alternative structures may be equally appropriate.