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ABOUT THE NZ AIRPORTS ASSOCIATION

The New Zealand Airports Association (NZ Airports) is the national industry voice for airports in New Zealand. It is a not-for-profit organisation whose members operate 37 airports that span the country and enable the essential air transport links between each region of New Zealand and between New Zealand and the world.

NZ Airports purpose is to:

- Facilitate co-operation, mutual assistance, information exchange and educational opportunities for Members
- Promote and advise Members on legislation, regulation and associated matters
- Provide timely information and analysis of all New Zealand and relevant international aviation developments and issues
- Provide a forum for discussion and decision on matters affecting the ownership and operation of airports and the aviation industry
- Disseminate advice in relation to the operation and maintenance of airport facilities
- Act as an advocate for airports and safe efficient aviation.

Airport members\(^1\) range in size from a few thousand to 17 million passengers per year. The full range of airport ownership structures are represented, including privately owned, council-owned, joint ventures between councils and the Crown, airport companies and public companies.

There are also a number of non-airport members including consulting and engineering firms that provide goods and services to the airport sector, and other aviation-related organisations.

If you have any questions regarding this document please contact NZ Airports on 04 384 3217.

\(^1\) Ardmore Airport, Auckland Airport, Chatham Islands (Tuuta) Airport, Christchurch Airport, Duned in Airport, Gisborne Airport, Hamilton Airport, Hawkes Bay Airport, Hokitika Airport, Invercargill Airport, Kapiti Coast Airport, Kaikohe Airport, Katikati Airport, Kerikeri Airport, Marlborough Airport, Masterton Airport, Matamata Airport, Motueka Airport, Nelson Airport, New Plymouth Airport, Palmerston North Airport, Queenstown Airport, Rangiora Airport, Timaru Airport, Rotorua Airport, Takaka Airport, Taupo Airport, Tauranga Airport, Wanaka Airport, Whanganui Airport, Wellington Airport, Westport Airport, Whakatane Airport, Whangarei Airport
FOREWORD

The NZ Airports Association (NZ Airports) has prepared this guide for airport master planning (in conjunction with the Australian Airports Association) to assist regional airport operators who often do not have the planning knowledge or resources typically available to the larger airports.

It is acknowledged that much of the content for this Guide has been adapted for New Zealand from the original AAA Airport Practice Note 4, Regional Airport Master Planning Guideline, with permission granted from the Australian Airports Association.

This guide 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
- Key elements of an 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.

The New Zealand Government has adopted The National Airspace and Air Navigation Plan to set a pathway to modernize all aspects of the aviation system. It is a guidance document that will provide clear direction on the safe, cohesive, efficient and collaborative management of New Zealand’s airspace and air navigation system over the next decade. It is being given effect by the New Southern Sky (NSS) programme led by the Civil Aviation Authority of New Zealand.

As part of NSS, the Ministry of Transport undertook a “stocktake” during 2015 and found that of the 32 airports serving scheduled passenger transport services, 19 have master plans.

This guide has been prepared with smaller regional and rural airports in mind, rather than large metropolitan airports. It is primarily intended for airports with limited funds for master planning and that have a mix of General Aviation (GA) and scheduled services.
This document should not be seen as a definitive set of rules for a regional Airport Master Plan. This guide 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 guide 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.

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 guide for the preparation of a Business Plan, Marketing Plan or the like for an airport.

A Master Plan is a guide and nothing more. It does not develop the specifics of improvements, nor make the case for any particular improvements. Its 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.

The information in this guide 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, airport operators should consider their own specific needs and circumstances and seek advice from appropriately qualified advisers. No material contained within this guide should be construed or relied upon as providing recommendations in relation to any particular development or planning outcome or decision.

The original content on which this Guide is based was prepared with the assistance of:

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This version was prepared with the assistance of GRG Consulting.
1 INTRODUCTION

Airports are critical components of New Zealand’s national economic infrastructure. They support trade and tourism and help to drive growth across the economy. Continual investment in, and upgrading of, the aviation infrastructure at airports is needed to drive national productivity and economic performance.²

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 required by statute³ to operate as commercial undertakings.

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.

Airports are part of a much wider “eco-system”. A change in one part of the system may have a significant impact on another. Anticipating expansion steps is therefore important and can be helpful to others in the system. The most efficient plan for the airport as a whole is that which provides the required capacity (including future requirements) for aircraft, passenger, cargo and vehicle movements, with the maximum passenger, aircraft operator and staff convenience at the lowest capital and operating costs.

Flexibility and provision for expansion should feature in all aspects of the planning. While the expansion of some infrastructure means a step change in capacity and investment, there can be many operational initiatives and minor investments that progressively enhance capacity of existing infrastructure before the next step change is necessary.

While anticipating expansion steps is highly desirable, each development will be designed and considered on its merits at the appropriate time. The Airport Master Plan simply “reserves” the necessary footprint of space for that possibility in the future.

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² National Airspace and Air Navigation Plan, June 2014, p.54
³ Airport Authorities Act, 1966, s.4(3)
2 IMPORTANCE OF AIRPORTS

There are over 30 airports across New Zealand which have regular passenger services and many more much smaller aerodromes and landing strips around the country, with 175 aerodromes (of all types) listed in the New Zealand Aeronautical Information Publication.

New Zealand’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.

New Zealand’s airports are assessed to generate added value of $419m per year and account for 5440 jobs. A further $6.5 billion per year and 80,000 jobs are involved directly in aviation-related activities in the airport environs.⁴

Importantly, activities that are enabled by airports include international tourism ($13.4 billion value added and 256,000 jobs), Domestic tourism by air ($3.5 billion value added and 51,000 jobs), business travel ($2.2 billion value added and 32,000 jobs), imports and exports by air ($13 billion value added and 154,000 jobs), and export education ($2.8 billion value added and 30,000 jobs).

Increasingly, accessible air links have become important to attract and retain businesses and high skilled employment in regional centres, and to enable patient transfers from smaller centres to centralized health facilities.

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.

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⁴ Economic and Social Contribution of New Zealand’s Airports, Market Economics, 2013
A study commissioned from Deloitte Access Economics by the Australian Airports Association examined the significant role of Australia’s network of airports, and identified some key points that are equally applicable in New Zealand:

- 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.
- 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.
- 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.

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5 Connecting Australia: The economic and social contribution of Australia’s airports, June 2012
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.

The Master Plan can help provide for the orderly development of the airport to meet current needs without inadvertently obstructing development that may be necessary to meet potential future needs. In addition to allocating and preserving space for future purposes, it can serve as a basis for coordinating plans for air navigation facilities, airspace use, and air traffic control procedures.

Preparation of the Master plan should involve collaboration with aviation partners, and consider resilience in the provision of airport services.

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.
The National Airspace and Air Navigation Plan (New Southern Sky — refer section 6) has an objective that the following features should be taken into account in each airport’s Master Plan where applicable:

- Increase aerodrome capacity using collaborative decision-making
- Take into account the need for integration with other aspects of the ATM system, landside operations and interaction with land-use planning
- Achieve all-weather throughput at as close to the levels of visual throughput as possible
- Improve the predictability of movements based on shared information
- Specify the infrastructure needed (surveillance tools, visual aids, approach types, lighting and geometry required), depending on the demands and needs of the system
- Ensure that appropriate contingency plans are in place that reflect a network management approach.

### 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
- Attraction of wildlife leading to the risk of strikes
- Building-generated wind-shear and turbulence from nearby development
- Public safety — particularly off the ends of runways
- Impacts on navigational aids
- Impacts of infrastructure on airport-based air traffic control services (eg Tower visibility).

An airport Master Plan may also address other off-airport planning issues such as ground transport arrangements serving the airport.
District Plans administered by local authorities under the Resource Management Act 1991 will be critical to the success of the airport Master Plan. The Master Plan needs to both take into account the provisions of the District Plan(s) affecting the airport environs, and be a tool to inform the land use planning processes involved in District Plans.

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 guide.
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 New Zealand however, are specified in the Civil Aviation Rules pursuant to the Civil Aviation Act 1990]

- **The Civil Aviation Rules (CAR), particularly CAR Part 139 Aerodromes — Certification, Operation and Use** contains the mandatory New Zealand standards for the design of airport facilities. CAR Part 139 rules prescribe the requirements for aerodromes generally in accordance with ICAO Annex 14. The Advisory Circulars associated with Part 139 provide guidance on acceptable means of compliance with the rules

- **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 International Air Transport Association’s Airport Terminals Reference Manual**, which provides guidance on designing airport terminals 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 New Zealand, this document is sometimes useful as an alternative or complementary source of information.
There are also a number of very informative books relating to airport planning and development including:


The Civil Aviation Authority’s *National Airspace and Air Navigation Plan* June 2014 contains significant reference material which should be taken into account in the forward planning of airports.

Another source of valuable information is other airport Master Plans. These may be available on the airport operator’s website or available on request.

By reference to these documents when preparing a new airport Master Plan or making changes to an existing airport Master Plan, 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 (page 19). 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 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.

Consideration should be given to the airport operator’s obligations as a lifeline utility under the Civil Defence Emergency Management Act.\(^6\)

### 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 (as long as possible and usually at least 20 years) and, importantly, how the airport operator would like to see it change. As far as possible the plan should contemplate the ultimate capacity and use of the airport site.

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 or more 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 “un-forecast” change might occur in the future?
- What opportunities are there?
- Are there any threats to the future development of the airport?

While rational forecasting of realistic growth should be given weight, experience shows that airports often experience changes in their operating environment that have not been forecast — such as

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\(^6\) See also clause 6.9 relating to the Regulatory and Policy Context
the impact of global events (eg the global financial crisis, and terrorism), changing legislation (eg introduction of Runway End Safety Areas), changes in airport design standards, and step changes in technology. Consideration should be given to the prospect of such changes so that an effort is made to address “what if” scenarios and accommodate through flexibility of design beyond what might have otherwise been conservatively forecast. Some sensitivity analysis might assist in keeping scenarios in perspective. The Master Plan goal should be to avoid foreclosing future options.

Early engagement with key stakeholders is particularly critical if the plan is likely to rely on formal regulatory consultation.

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 will the Master Plan be implemented?”

Depending on the objectives of the Airport owner, the Master Plan will not usually attempt to create a timeline for implementation of the capacity planned.

It may however identify some basic key triggers that might initiate particular aspects, or discrete stages of development identified in the plan.

The timing of development will usually be determined by business growth, changes in aircraft type used by airlines, and commercial decisions on investment at the time. The Master Plan prepares the allocation of space to provide for the development but does not of itself represent a commitment to proceed with any particular component of development or the timing of that development.

If stages of development are to be identified, consideration should be given to:

- Identification of specific actions required to maintain the integrity of the plan
- Trigger points — these are more likely to be volume or activity based triggers, rather than time based — for major phases of development
- Identification of any interdependencies implicit in the Plan.

Cost estimates for key projects, and possible funding sources, are unlikely to be outlined in the Master Plan and instead will be the subject of separate discreet business cases and planning exercises.

Implementation is discussed further in section 9.8

The Plan should also explicitly anticipate regular review or update (likely to be between 5 and 10 years).
**BASIC MASTER PLAN PROCESS**

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<td>IDENTIFY KEY STAKEHOLDERS</td>
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<td>STAGE 1 — SITUATION ANALYSIS</td>
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<td>How do we get there?</td>
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<td>STAGE 4 — IMPLEMENTATION PLAN</td>
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<td>How do we ensure arrival?</td>
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<td>DRAFT MASTER PLAN</td>
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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 New Zealand this largely (but not exclusively) occurs through the Civil Aviation Act 1990 and associated regulations which are administered by the Civil Aviation Authority (CAA).

The relevant regulations in New Zealand are the Civil Aviation Rules (CARs). CAR Part 139 prescribes the requirements for aerodromes used in air transport operations, in accordance with ICAO Annex 14 — Aerodromes. The Advisory Circulars associated with CAR Part 139 provide detailed standards and operating procedures as a means of rule compliance for aerodrome operations in New Zealand.
6.2 National Airports Safeguarding Framework

At the present time New Zealand does not have any equivalent of Australia’s National Airports Safeguarding Framework. This 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
- 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 Australian 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.

Airport operators in New Zealand need to plan for and advocate to local government and the other relevant planning bodies for the principles and detail that should address the above issues so that they are reflected in national documents, District Plans and Regional Planning documents.

A New Zealand standard, NZS 6805:1992 Airport Noise Management and Land Use Planning is generally accepted as current best practice for managing airport noise and the interface with other land uses. Airports should have a noise management plan including a noise complaint register and a means of regular consultation with affected parties.

The risk to aviation from wildlife in the vicinity of airports needs to be carefully managed — from influencing the use of nearby land to avoid aggravating or attracting a wildlife risk, to day to day actions that can reduce risk. The CAA have published a “Good Aviation Practice” on bird hazards.
The Department of Conservation, in conjunction with NZ Airports, has produced guidelines for the management of the risk from birds, including the means to obtain authorisation to disturb or kill protected species at airports where necessary for safety reasons, and this needs to be actioned at a local level to achieve protection for the airport.

6.3 The Resource Management Act

The Resource Management Act 1991 (the RMA) is the New Zealand Government’s central piece of environmental legislation. Its purpose is to promote the sustainable management of natural and physical resources.

“Sustainable management” for the purposes of the RMA means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while —

(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations
(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems
(c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The Act identifies seven matters of national importance:

(a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development
(b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development
(c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna
(d) The maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers
(e) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga

(f) The protection of historic heritage from inappropriate subdivision, use, and development

(g) The protection of protected customary rights.

Many aspects of the RMA are given effect through the District Plans that are administered by territorial local authorities.

Airport Authorities, as defined in the Airport Authorities Act, are "network utility operators" for the purposes of the Resource Management Act (s.166) and may be approved (s.167) as a "requiring authority" with the power to give notices of requirement for designations in District Plans.

The Master Plan should include an assessment of whether the RMA comes into play for any proposals in the plan, and the extent to which the proposals align with the provisions of the District Plans that incorporate the airport and its environs.

Councils considering proposals under the RMA have obligations to consult with tangata whenua through iwi authorities. Early consultation with iwi should be considered during the preparation of the Master Plan.

6.4 Airport Authorities Act

The Airport Authorities Act 1966 empowers airport authorities to operate and manage airports, and requires them to be operated or managed in a commercial manner.

Among other things, the Act gives leasing powers to airports and allows an airport to terminate a lease if an affected property is required for airport purposes.

Companies owning and operating airports are authorised by Order in Council pursuant to s.3(3) of the Airport Authorities Act to be an "Airport Company". Airport Companies are authorised to exercise the powers of a Local Authority under section 3 of the Airport Authorities Act.

Airport companies with annual revenue of over $10 million are required to consult with their substantial customers before approving significant capital expenditure.
6.5 Local Government Legislation and Policy

The territorial and regional Government regulatory and policy context will vary in relevance to the airport and the Master Plan.

Of particular relevance will be any policies or provisions under the Local Government Act or other legislation relating to:

- Aviation (eg. Integrated transport policy)
- Airports, airfields or heliports
- Land use, including road access
- Environmental matters
- Cultural heritage
- Infrastructure provision
- Economic development.

The Master Plan should outline any applicable local or regional Government policy and its effect on the planning of the airport.

6.6 Local Government District Plan

Local Government policies and planning controls as expressed in District Plans will 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 effect 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.
6.7 National Airspace Policy

The National Airspace Policy of New Zealand was published in 2012. The policy envisages integration between airspace and land uses, especially around airports:

“There is an important interface between airspace and land use planning at aerodromes regarding noise emissions from aircraft taking off and landing, and in the case of potential obstacles or hazards which extend beyond the immediate vicinity of aerodromes. More efficient performance-based procedures have the potential to reduce fuel use and emissions, and in some cases, may enable flight paths that reduce current impacts on development in the vicinity of aerodromes. The government expects the aviation sector and local authorities to proactively address their respective interests in any future planning. Local authorities should facilitate the adoption of rules and designations in regional and district plans that recognise new and modified aircraft arrival and departure paths, including timely completion of all submission and hearing procedures.

To avoid or mitigate incompatible land uses or activities and potential obstacles or hazards that will impact, or have the potential to impact on the safe and efficient operation of aircraft, regional and district plans should have regard to applicable Civil Aviation Rules. Airport authorities and local authorities should work together in a strategic, cooperative and integrated way to ensure that planning documents (including those under the Resource Management Act) appropriately reflect the required noise contours and/or controls and approach and departure paths that take account of current and projected traffic flows.

Resource Management Act planning tools (including plan rules and designations) should as far as practicable seek to avoid the establishment of land uses or activities and potential obstacles or hazards that are incompatible with aerodrome operations or create adverse effects.”

6.8 National Airspace and Air Navigation Plan — New Southern Sky

Approved by the government in early 2014, New Southern Sky is the implementation plan for the national airspace policy.

It gives a clear direction on incorporating new and emerging technologies into the aviation system to ensure the safe, cohesive, efficient and collaborative management of New Zealand’s airspace and air navigation to 2023.

The modernisation of airspace and air navigation in New Zealand will involve improved efficiency of air traffic movements, more accurate navigation, reduced reliance on ground based systems, and improved communications. Increased information availability will also enable more effective decision making. Together, these changes will mean lower operating costs and improved aviation safety.

6.9 Civil Defence Emergency Management Act

Most commercial airports in New Zealand are named in the Civil Defence Emergency Management Act as specific entities that are lifeline utilities (Schedule 1 of the Act) with obligations that include enabling the airport to function to the fullest extent, even though this may be at a reduced level, during and after an emergency (s.60).

These airports are also obliged to participate in the development of national strategy and plans.
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 (eg. airline, GA, charter, training)
- Fleet mix (eg. 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 scheduled passenger services if can be more complex.

Several of the reference documents referred to in section 4 of this guide 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 CAR part 139 is the Aerodrome Reference Code system. This is described in Appendix B of the rule.

An aerodrome Reference Code, comprising a code number and letter, is selected for aerodrome planning purposes must be determined in accordance with the characteristics of the aeroplane for which an aerodrome facility is intended. 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 Reference Code is required to be determined by the rule, using a table that is provided in Appendix B (and repeated on the following page for convenience).
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 above 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:

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. The aeroplane reference field length is solely for the selection of a code number and is not intended to influence the actual runway length which will be influenced by other factors.

The Code letter for element 2 of the Aerodrome Reference Code is determined from column 3 of the previous 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.

The outer main gear wheel span in column 5 is the distance between the outside edges of the main landing gear wheels.

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

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 scheduled passenger aircraft.

A number of aircraft are commonly used in the New Zealand aviation industry for small passenger operations and for corporate charter. The majority of passenger operations into regional centres are serviced by turboprop aircraft with a seating capacity up to 68 passengers. The two most common aircraft are Dash 8 Q300 and Q400, and ATR72, which are all Code C aircraft.
There are many types of corporate aircraft used in New Zealand. Typically, corporate aircraft 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.

The table below 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.

**TYPICAL AIRCRAFT CHARACTERISTICS**

<table>
<thead>
<tr>
<th>AIRCRAFT</th>
<th>SEATS</th>
<th>ARFL(M)</th>
<th>MTOW(KG)</th>
<th>ACN</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro III</td>
<td>19</td>
<td>991</td>
<td>6577</td>
<td>4</td>
<td>2B</td>
</tr>
<tr>
<td>Dash 8-Q300</td>
<td>50</td>
<td>1122</td>
<td>18642</td>
<td>10</td>
<td>2C</td>
</tr>
<tr>
<td>Learjet 55</td>
<td>8</td>
<td>1292</td>
<td>9298</td>
<td>6</td>
<td>3A</td>
</tr>
<tr>
<td>Metro 23</td>
<td>19</td>
<td>1341</td>
<td>7484</td>
<td>4</td>
<td>3B</td>
</tr>
<tr>
<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>
<td>3C</td>
</tr>
<tr>
<td>Jetstream 41</td>
<td>29</td>
<td>1500</td>
<td>10433</td>
<td>5</td>
<td>3C</td>
</tr>
<tr>
<td>ATR 72-600</td>
<td>68</td>
<td>1165</td>
<td>21566</td>
<td>12</td>
<td>3C</td>
</tr>
<tr>
<td>SAAB-340</td>
<td>35</td>
<td>1220</td>
<td>12371</td>
<td>5.7</td>
<td>3C</td>
</tr>
<tr>
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<td>180</td>
<td>2256</td>
<td>70535</td>
<td>46</td>
<td>4C</td>
</tr>
<tr>
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<td>180</td>
<td>2058</td>
<td>72000</td>
<td>40</td>
<td>4C</td>
</tr>
</tbody>
</table>

Note A: For indicative purposes only. Specific values for particular aircraft should be obtained from the aircraft operator or the aircraft manufacturer. Note B: ARFL = Aeroplane reference field length. Note C: MTOW = Maximum take-off weight. Note D: 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 international airport it may be appropriate to adopt the Code F design aircraft. However, for regional airports with existing or proposed scheduled passenger
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 rules, certain standards vary depending upon whether the runway is a:

- Non-instrument runway
- Instrument, non-precision approach runway
- Instrument, precision approach runway.

For example, 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.
The annual capacity of a single runway configuration can exceed 195,000 movements with suitable taxiway, apron and air traffic control facilities\(^a\).

In relation to runway length, Section 3.1.6 of AC139-6 states “the actual length to be provided for a primary runway should be adequate to meet the operational requirements of the aeroplanes for which the runway is intended and should be not less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant aeroplanes.”

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 CAA.

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 AC139-6, requirements for the movement area layout can be determined.

For smaller aircraft engaged in domestic and regional scheduled passenger operations (eg. Dash 8 Q400) 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 Appendices A and C of CAR Part 139 and in chapter 3 of AC139-6.

Although a 300m Strip (150m each side of centerline) is only required for a code 3 or 4 precision approach, and most regional airports might only currently require a 150m Strip, consideration should be

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\(^a\) ICAO Airport Planning Manual
given to future-proofing the airport to the higher standard if practical. The rapid development of augmented GNSS based instrument approaches and corresponding aircraft equipage will potentially give precision approach capability for most runways, even at GA airports, necessitating the wider Strip width.

There may be additional reasons to consider protecting the wider strip, including the possibility of future pressure to further align CAR Part 139 with ICAO Annex 14 recommendations and international best practice. Standards for separation of parallel taxiways to instrument non-precision runways and the PANS OPS protection surfaces (see 7.10) are generally based on a 300m Strip width.

The positioning of the terminal building and other structures fronting onto the operational area can become limiting constraints on the operational area, including ultimately the protection of the strip width — see comments on the airside boundary of passenger terminal buildings in 7.8.

Important requirements relating to movement area lighting are contained in chapter 5 of AC139-6.

WELLINGTON AIRPORT APRON LAYOUT (WELLINGTON AIRPORT MASTER PLAN 2010)
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.

The method for calculating the PCN is set out in section 2.5 of AC139-6. For pavements intended for aircraft over 5,700kg apron (ramp) mass the bearing strength is to be made available by reporting all of the following:

(a) The pavement classification number (PCN)
(b) Pavement type for ACN PCN determination
(c) Subgrade strength category
(d) Maximum allowable tire pressure category or maximum allowable tire pressure value
(e) Evaluation method.

The bearing strength of a pavement intended for aircraft of apron (ramp) mass equal to or less than 5,700 kg should be made available by reporting the following information:

(a) Maximum allowable aircraft mass
(b) Maximum allowable tire pressure.

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.

The strength of runway pavements is required to be reported in the Aeronautical Information Publication (AIP) using the ICAO adopted ACN-PCN pavement strength rating system.
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:

- AC139-6 which specifies standards for siting and clearance areas for airways facilities on airports (ie. navigation aids, communication facilities, meteorological facilities and ATC facilities)
- Chapter 5 of AC139-6 which contains detailed requirements for “visual aids for navigation”
- AC139-4 which specifies standards applicable to the provision of Aerodrome Rescue and Fire Fighting Services
- Where Aerodrome Air Traffic Control is required by the Director of CAA, CAR Part 172 requirements will need to be considered for the siting of an air traffic control tower.
In relation to airways facilities, CAR Part 139 (139.121) requires the ongoing protection of navigation aids and ATS facilities.

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 AC139-6 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.

### 7.8 Passenger Terminal

After the airside or movement area, the passenger terminal zone is the most important facility and one of the principal elements of capital cost at an airport with scheduled passenger 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.
The position of the airside boundary of passenger terminal buildings is particularly important as airfield operations are governed by a regulatory framework characterised by standards and proscriptive clearances. These must be carefully considered when expansions, renovations and redevelopments are contemplated.

Each airport has its own unique requirements that will determine the location of the airside boundary of the passenger terminal building. In addition to separation distances from runways, many aspects of airport operations should be considered in setting such a boundary — aspects such as runway access, taxiway flows, apron operation, ATC line of sight, ground service equipment (GSE) requirements and airside roads. The location of the airside boundary of the passenger terminal building should be based on potential future airside operations beyond the requirements of currently operating aircraft and current modes of operation.

It is best practice when developing a potential airside boundary of a passenger terminal to begin from the runway(s) centreline and compiling allowances outwards from there. The process to establish the location of the boundary will usually consider multiple options for the types and scale of allowances that the boundary will provide. At every stage the standards and requirements for clearances for the adopted design aircraft should be taken into account.

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 footprint 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 for Aviation Security must be considered. Specific security requirements are set out in CAR 139 Subpart D “Aerodrome Security” for both security-designated and non-security designated airports.

The Director of the CAA can declare an airport, or parts of it, to be security-designated (refer s.84 of the Civil Aviation Act).

The requirements for passenger screening are determined by the Director of the CAA. The threat level to New Zealand is monitored and the security requirements of airports are adjusted accordingly.

The Master Plan should be developed after consulting the CAA on the National Aviation Security Programme as it may affect the airport, and the current state of security requirements. A level of judgement will then need to be exercised on the prospect of future higher levels of security being required (such as hold stow baggage screening or new “tiers” of security requirements).

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)
- 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.

AC 139-6 Chapter 4 describes Obstacle Limitation Surfaces (OLS) as:

“surfaces in the airspace above and adjacent to the aerodrome. These obstacle limitation surfaces are necessary to enable aircraft to maintain a satisfactory level of safety while manoeuvring at low altitude in the vicinity of the aerodrome. These surfaces should be free of obstacles and subject to control such as the establishment of zones, where the erection of buildings, masts and so on, are prohibited. Where obstructions infringe these surfaces they may, subject to the conduct of an aeronautical study, be removed, reduced in height, marked and lit.”

The physical dimensions of the OLS surfaces must be determined using Tables 4-1 and 4-2 in AC 139-6 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 (in relevant District Plans). If such controls are not already in place the Master Plan should recommend that the relevant Local Government authorities introduce such controls based on the applicable airspace surfaces.

Performance Based Navigation (PBN), such as discussed in the NSS implementation programme, is enabling approach and departure tracks that vary from traditional flight paths near airports. It is necessary to ensure the new flight paths are considered when land use controls are established or reviewed.

7.11 Aircraft Noise Contours

Noise from aircraft can have unavoidable effects outside the airport fence. 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 incompatible aircraft noise
- The amenity of surrounding developments is not adversely affected by aircraft noise
- Airport operations are protected long term from conflicts due to the encroachment of inappropriate development into noise affected areas.

New Zealand standard NZS:6805 Airport Noise Management and Land Use Planning is generally accepted as a sound basis for addressing both the monitoring and management of airport noise, and the control of land use that is potentially a risk to the airport through “reverse sensitivity” — the risk of conflict with existing and future airport activities from inappropriate land use in the vicinity of an airport.

NZS 6805 establishes air noise contours based on a weighted level of day and night time accumulated noise energy. The contours usually form the basis for land use planning in the District Plan and through modelling of projected airport use, set limits on the noise energy to be generated at an air-noise boundary.
An airport Master Plan should include 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 NZS 6805. If such controls are not already in place the Master Plan should recommend that the relevant Local Government introduce such controls.

7.12 Public Safety Off-Airport

While the Runway End Safety Area (RESA) provides for the safety of aircraft and passengers close to the ends of the runway, and within the operational area of the airport, consideration needs to be given to the safety of the public off the airport but particularly within the vicinity of the runway approach paths.

This is usually achieved by Local Government zoning for appropriate use of any land spanning an area defined as a Runway Protection Zone off the ends of the runways, and will likely compliment land use controls that reflect the air noise contours as well.

FAA documentation⁹ provides the most authoritative guidance on the dimensions and land use limitations that should within Runway Protection Zones.

7.13 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.

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⁹ FAA Advisory Circular AC No: AC 150/5300-13A
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 District Plan, or any other regulation, need to be identified.

Consideration should be given to consulting local iwi at an early stage to identify and understand any potential issues.

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 airport operator should anticipate the need for regular and ongoing consultation with airport users, local authorities, and the neighbouring community to improve information sharing and strengthen planning and development outcomes. While aircraft noise will often be the focus of community consultation, community consultation can extend to the use of roads accessing the airport, parking arrangements, signage, and wildlife control.

The conduct of an effective consultation program does not necessarily mean that all interested parties will be satisfied with the outcome. Rather, it is about ensuring that a proposal has been fully explored, concerns identified and alternatives considered.

8.1 Consultation Plan

A project specific Consultation Plan should be prepared for the Master Plan.

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:

- New Zealand Government agencies (particularly CAA, Ministry of Transport, and in the case of international operations Government border agencies).
- Tangata whenua
- Local Government
- Elected representatives
- Adjoining and nearby land owners and residents
- Community groups
- General public
- Aviation users of the airport
- Tenants on the airport
- Other Industry (particularly airport-related 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 including the following 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 meetings — 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.

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.

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, particularly if there is likely need for formal regulatory consultation to achieve the Plan’s objectives. 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 guide, 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.

Refer to section 9.8 “Implementation” for comments concerning publication of the Master Plan.
9 KEY ELEMENTS OF THE PLAN

This section briefly outlines what may be considered the key elements of an 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 guide, 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.
The Local government planning controls applying to the airport site must be considered when developing the Land Use Plan. The airport Land Use Plan will need to be consistent with the relevant planning controls affecting the airport. Where changes to the planning controls are desirable or appropriate to give effect to the Master Plan, these should be recommended in the Master Plan and identified as an action in the Implementation Plan. Consultation with the relevant planning agency will be important in this regard.

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)
- 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 CAR regulatory environment (and AC 139-6 in particular) 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. While this is an optional element, it is one that may be appropriate for busy airports that generate significant vehicle movements.

A Ground Transport Plan may include details of:

1. Road network plan
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)
3. Linkages between the road network and public transport system at the airport and the road network and public transport system outside the airport
4. The arrangements for working with 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)
5. The capacity of the ground transport system to support airport operations and other airport activities
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 outside the airport boundary 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 Maori and historic 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.

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 specific risks likely to arise for the airport as a consequence of off-airport land use
- The airport’s airspace protection surfaces — as discussed in section 7.10
- The airport’s forecast of air noise contours and NZS 6805, plus current provisions in the relevant District Plans, and the expectations of the management of land use as a consequence of aircraft noise
- 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 Local Government authorities introduce such controls.

Local Government is not necessarily aware of the importance to the air transport network (and consequently national and regional economies) of safeguarding airports to enable them to meet
current and future capacity requirements. It is therefore imperative that airports work with Local Government to provide the basis for safeguarding the ongoing capacity of the airport.

9.8 Implementation

This section of the Master Plan will be the outcome of stage 4 of the planning process discussed in section 5.4.

This may involve an Implementation Plan which could include:

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

The timing of development will however usually be determined by business growth, changes in aircraft type used by airlines, and commercial decisions on investment at the time. The Master Plan prepares the allocation of space to provide for the development but does not of itself represent a commitment to proceed with any particular component of development or the timing of that development.

Staging of development may be included to show, for example, the sequencing of major infrastructure upgrades such as runway or taxiway improvements.

The Master Plan should include any actions that need to be taken to actively protect the future long term capacity planned in the Master Plan.

Where the Plan, or components of it, have been subject to public consultation, the outcome of that consultation should be published. All consultation phases should be concluded by making the outcome available for the information of submitters.

Consideration should however be given to the extent to which the Master Plan as a whole will be made public. If it contains commercially sensitive material such as proposed designations over land to be acquired, consideration should be given to having a public summary document.

Consideration should be given to ensuring that the airport operator’s business plan and communications plan are aligned with the Master Plan.
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 guide, 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 and local 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.
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 guide.

2.1.4 Regulatory Context
Discuss the regulatory context — refer to Part A, section 6 of this guide. Particular reference should be made to the CAA rules and supporting standards, and in particular AC139-6.

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

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 Strategic Vision and Objectives

The vision statement and objectives provide broad guidance and direction for the development of the airport. The development of the vision and objectives will be 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.

2.2.1 Strategic Vision

The vision for the airport is:

* Insert vision or mission statement.

2.2.2 Objectives

The objectives for the airport are:

* Insert objectives for the airport.

2.3 Current Situation

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

2.3.1 Ownership and Management

Describe the ownership and management of the airport.

2.3.2 Site Description

Describe the airport site e.g. location, boundaries, area, topography.

2.3.3 Surrounding Land

Describe the land surrounding the airport, particularly the existing land use and development around the airport. Identify any issues or constraints.
2.3.4 Existing Activities
Describe the existing aviation and non-aviation activities on the airport site.

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

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

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

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

2.3.9 Heritage Values
Describe any heritage values on the airport site. Identify any issues or constraints.

2.4 SWOT Analysis
Discuss the outcomes of the SWOT analysis.

2.4.1 Strengths and Advantages
What are the airport's strengths and what advantages does it have?

2.4.2 Weaknesses and Constraints
What are the airport's weaknesses and what constraints are there?

2.4.3 Opportunities and Prospects
What opportunities or prospects exist in terms of future airport development?
2.4.4 Threats and Risks
Are there any known threats or risks that may affect the airport in the future?

2.4.5 Summary of SWOT Analysis
Discuss the key outcomes of the SWOT analysis.

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

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

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 AC139-6 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 NZS 6805 and the current status of air noise contours and air noise boundary — in relation to forecast levels and adequacy of District Plan provisions.

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 guide.

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 guide.
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
- Control tower.

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 guide.

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 guide.

Include a plan showing key environmental sites.

3.5 Iwi and Heritage Management Plan

Optional, but should be included if the airport site contains significant iwi or heritage values. Refer to Part A, section 9.6 of this guide.

Include a plan showing key heritage sites.
3.6  Airport Safeguarding Plan

Refer to Part A, section 9.7 of this guide.

3.6.1  Airports Safeguarding Framework

Discuss the need for an airport safeguarding framework and any specific risks identified as a threat to the airport future capacity arising from off-airport land use.

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 forecast noise contours under NZS 6805 and the need for off-airport land use to comply with the standard.

Discuss any airport noise management plan if one exists or is to be prepared.

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 Local Government authorities introduce such controls.

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 guide.

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.