

CEDUNA AIRPORT MASTER PLAN



APRIL 2013



FOREWORD

This Master Plan for Ceduna Airport is an extension and review of previous master plans that enhances the opportunities within the Airfield Zone and recognises the distinct precincts that exist within that zone.

The plan clearly reserves planning and development opportunities within the following precincts:

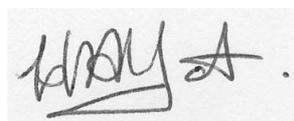
- Airfield;
- Environment; and
- Commercial.

The background to master planning of airports in Australia is somewhat vague, having no formal procedures specified for use by airport planners other than a section within the International Civil Aviation Organisation Manual, Part 1 Master Planning (1987) that provided some information on the processes involved but which were predominantly specific to international airports.

The advent of the government's privatisation of capital city and secondary airports in Australia established the Airports Act 1996 and Regulations 1997 which included a framework for master plan development for airports. While this Act and the Regulations are not mandated for Ceduna Airport, they do provide an interim guide for airport master planning until State or Local Government regulations are introduced.

This Master Plan has utilised the government's guidelines in the development of the plan, recognising Ceduna Airport's position in relation to State and Local Government planning regimes.

Accordingly, this plan seeks to integrate the State and Local Government planning regimes with the guidelines of the Federal Act to ensure the long-term protection of the airfield as a major economic and social driver for the Ceduna region.



Airport Manager

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ABBREVIATIONS

AAL	Adelaide Airport Limited
AEP	Airport Emergency Plan
ANEC	Australian Noise Exposure Concept
ANEF	Australian Noise Exposure Forecast
ANEI	Australian Noise Exposure Index
ATSB	Air Transport Safety Bureau
BOM	Bureau of Meteorology
CASA	Civil Aviation Safety Authority CASRs Civil Aviation Safety Regulations
DCC	District Council of Ceduna
DoIT	Department of Infrastructure and Transport
DMP	Draft Master Plan
ETSA	Electricity Trust of South Australia
GA	General Aviation
GDP	Gross Domestic Product
GIS	Geographic Information System
GPS	Global Positioning System
GSP	Gross State Product
ICAO	International Civil Aviation Organisation
LGA	Local Government Association
MOS	Manual of Standards
MP	Master Plan
MTOW	Maximum Take Off Weight
NASAG	National Airport Safeguarding Advisory Group
OLS	Obstacle Limitation Surface
PAR	Plan Amendment Report
RPAs	Rules and Practices for Aerodromes
RPT	Regular Public Transport
SA	South Australia
SES	State Emergency Service
TSP	Transport Security Plan
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

GLOSSARY

Ab initio

All training up to completion of commercial pilots licence and multi-engine command instrument rating.

Aerodrome/Airport

A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Airport Emergency Plan

A plan developed by the airport operator to coordinate all agencies and their individual Airport Emergency Procedures, State or supporting area plans for dealing with an airport emergency.

Airport Emergency Procedures (Standard Operating Procedures) Individual agency procedures for meeting the Airport Emergency Plan.

Airline Operator

The operator of a Regular Public Transport air service.

Aviation-Related Support Industry

Includes aircraft hangars, catering services, freight terminals, car rental and valet facilities, car parking, vehicle storage, fuel depots and hydrants, storage facilities and warehousing, offices, engineering support and maintenance activities and passenger terminals.

Airside

The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.

Apron

The part of an airport used for the purpose of enabling passenger to board, or disembark from aircraft; for loading cargo onto, or unloading cargo from, aircraft; and or, for refuelling, parking or carrying out maintenance on aircraft.

Aviation Security

A Combination of measures and human and material resources intended to safeguard civil aviation against acts of unlawful interference.

Department

The Commonwealth Department of Infrastructure and Transport.

Farming

Cropping and grazing, including horse or animal agistment (except agistment for air freight or export purposes) and horticulture.

In Flight

In flight commences when the last external door of the aircraft is closed in preparation for the first movement of the aircraft for the purpose of taking off; or if the aircraft moves before all doors are closed for the purpose of taking off, when it first so moves, until the first external door of the aircraft is opened after the aircraft comes to rest.

Landside

That area of an airport and buildings to which the public normally has free access.

Manoeuvring Area

Those parts of an airport used for the take-off landing and taxiing of aircraft, excluding aprons.

Movement Area

That part of an airport used for the surface movement of aircraft, including manoeuvring areas and aprons.

Prohibited Area

In relation to an airport, means any part of the airport upon or in relation to which is posted a notice to the effect that access to that part of the airport is prohibited.

Regular Public Transport Service

A service consisting of Regular Transport aircraft operations, as prescribed in the Civil Aviation Regulations

Regulatory Signs

A sign that advises of any law, regulation or restriction that it would be an offence to disregard.

Runway-related Activities/Facilities

Includes runways, taxiways, aprons, clearways, compass swing and engine run-up areas, glide path facilities, helicopter landing, parking, training and servicing, landing equipment, radar and all aircraft navigational aids.

Secretary

The secretary to the Commonwealth Department of Infrastructure and Transport.

Sterile Area

In relation to an aerodrome, means an area in the aerodrome to which persons, vehicle and goods are not permitted access until given clearance, in relation to aviation security, under Section 12 of the Aviation Transport Security Act 2004.

Transport Security Program

A written plan prepared by an airport operator that details security measures and procedures for the airport as approved by the Secretary, Department of Infrastructure and Transport.

1 INTRODUCTION

1.1 Background and Legislative Requirements

Ceduna Airport is located to the east of the regional centre of Ceduna in the State of South Australia approximately 800 km, or a 1 hour 15 minute flight from Adelaide. The airport lies on the eastern fringe of Ceduna and is adjacent to the National Highway road network. The airport was constructed on its current site in 1951 with ownership passing from the Commonwealth Government to the District Council of Ceduna in 1991.

The facility today provides a daily passenger service to Adelaide by one airline operator, Regional Express, and numerous other flights. The Council last adopted an Airport Master Plan in May 2002.

Authoritative guidance on what information is required in an Airport Master Plan has been sourced from within the Airports Act (1996) and Regulations and adapted where applicable to the local government arena. Ceduna is not required to prepare an Airport Master Plan under the Act's provisions; however the Act has been used as a guideline.

Additionally, there are numerous other acts pertaining to the operation of aviation and aviation safety to which Ceduna Airport must comply.

1.2 Contents of an Airport Master Plan

The contents of a Master Plan under Section 71 of the Act should include:

- development objectives, including the extent of consistency (if any) with State and Local Government planning schemes in South Australia;
- assessment of future needs of the airport users for services and facilities relating to the airport;
- intentions for land use and related development of the airport site (covering landside, airside, surface access, and land use planning/zoning), including the extent of consistency (if any) with planning schemes in South Australia;
- forecasts relating to noise exposure levels, over a 20-year planning period;
- flight paths for aircraft likely to use the airport in the future;
- ANEFs for the surrounding airport lands;
- plans, developed through consultation with airline users of the airport and Local Government bodies, for managing aircraft noise intrusion above significant levels; and
- assessment of the environmental issues that might reasonably be expected to be associated with the implementation of the plan and the airport's plans for dealing with those expected issues.

In addition to requirements under the Act, the Airports Regulations 1997 also contain requirements for airport master plans. These requirements relate to:

- the airport operator’s plans for dealing with any soil pollution referred to in the report; and
- an airport master plan must, be consistent with land use planning, zoning and development legislation in force in the State or Territory in which the airport is located.

These requirements and the location in the document where each is located are shown in Table 1.1.

Airports Act 1996 Requirements	Location within Document
Assessment of the future needs of the airport users for services and facilities relating to the airport	Section 4
Forecasts relating to noise exposure levels over a 20 year planning period	Section 4
ANEF’s for the surrounding airport lands	Section 5
Plans, developed through consultation with airline users of the airport and the neighbouring Local Government bodies, for managing significant aircraft noise intrusion above significant levels	Section 5
Development objectives, including the extent of consistency (if any) with planning schemes in South Australia	Section 6
An airport master plan must, be consistent with, land use planning, zoning and development legislation in force in the State or Territory in which the airport is located	Section 6
Intentions for land use and related development of the airport site (covering landside, airside, surface access, and land planning/zoning) including the extent of consistency (if any) with planning schemes in South Australia	Sections 6 and 7
Assessment of the environmental issues that might reasonably be expected to be associated with the implementing of the plan and Ceduna’s plans for dealing with those expected issues.	Section 8

Table 1.1 Airports Act 1996 Requirements

2 MASTER PLANNING PROCESS

2.1 Purpose of the Master Plan

The Master Plan provides the airport operator, the Commonwealth, State and Local government, the local community, aviation industries and interests, commercial users and investors with confidence to plan for the future development of the airport, its environment and the broader community. It provides the basis for planning of aviation activities, land and commercial development, environmental management and infrastructure delivery in an integrated and timely manner.

2.2 Background Studies

The Master Plan is based upon several detailed studies undertaken in recent years concerning airport planning, runway and terminal development, land use planning and environmental and socioeconomic issues, namely:

- *Ceduna Master Plan 2001*
- *Ceduna Master Plan Review 2008*
- *Ceduna Airport Economic Impact Assessment* (Hudson Howells), April 2010;
- *Ceduna Runway Capacity Assessment* (Aerodrome Design Pty Ltd), April 2010;
- *Ceduna Pax and Movement Forecasting* (Adelaide Airport Ltd), 2010; and
- *Ceduna Airport Environmental Due Diligence Report* (Adelaide Airport Ltd) 2010.

2.3 The Master Planning Process

The background to master planning of airports in Australia is somewhat vague having no formal procedures specified for use by airport planners other than a section within the *International Civil Aviation Organisation Manual, Part 1 Master Planning* (1987) that provided some information on the processes involved but which were predominantly international airport specific.

The advent of the government's privatisation of capital city and secondary airports in Australia established the *Airports Act 1996* (the Act) and *Regulations 1997* which included a framework for master plan development for airports.

This Master Plan has utilised the government's guidelines in the development of the plan recognising the Ceduna Airport's position in relation to State and Local Government planning regimes. While this Act and Regulations are not mandated for Ceduna Airport, they do provide an interim guide for airport master planning until State or Local Government regulations are introduced.

Under the Act, master plans are updated on a 5-yearly cycle and cover a 20-year timeframe.

The master planning of airports presents a concept for the ultimate development of the airport site and provides some more detailed concepts for the period covering the next 20 years. The Master Plan should be used as a guide for:

- development of airport facilities for both aviation and non-aviation uses;
- assessment of the environmental effects of aerodrome construction and operation;
- development of land uses for areas surrounding the airport; and
- establishment of airport access requirements.

2.4 Consultation

The Master Plan has been developed in consultation with a wide range of stakeholders.

The consultation program has included:

- circulation of draft plans for inspection;
- consultation with local business leaders and aviation industry stakeholders;
- placing the Master Plan on the Council's web-site; and
- conducting a public consultation process of the final Draft Master Plan in accordance with Council's policy 1.13 'Community Consultation'.

3 CEDUNA AIRPORT

3.1 Airport Site

The airport is located in Ceduna in the western part of South Australia. The airport lies on the eastern fringe of the regional centre and is adjacent to the National Highway road network (The Eyre Highway). The current location is well sited providing good access to Ceduna, however it is not so close as to be subject to resident concerns about noise or to face major issues relating to proximity to nearby incompatible land uses or restrictions to possible expansion, at this point in time.



Figure 3.1: The Airport Location within Ceduna

3.2 Airport History

The history of the airport is based on extracts from the book *Life on the Edge: The Far West Coast of South Australia* by Jim Faull, Ceduna, SA, 1988.

“... the Department of Civil Aviation was convinced that an aerodrome was needed at Ceduna and one was constructed in 1929. Because of the availability of cheap flat land near the town it was not an expensive or elaborate exercise and it was topped off with what was called a 'rest house' for passengers which was 'luxuriously furnished'. It still stands today, but is no longer luxuriously furnished.”

“With the aerodrome established, West Australian Airways Ltd. opened a regular passenger and mail service flying Perth to Kalgoorlie to Forrest to Ceduna to Adelaide and vice versa.

“The first plane to begin the service was the City of Perth, a De Havilland Hercules, three-engine 'airliner' capable of carrying 14 passengers. For its first flight in May 1929, the Ceduna aerodrome was lined with cars, and four lorry loads of children were brought from the school.

“In 1931 Viastra planes were introduced by West Australia Airways. They had two engines, carried 13 passengers and could travel at 150 mph. Multiple engines were needed for their reliability because the planes had to fly over vast areas of uninhabited country and, additionally, for safety reasons, the Department of Civil Aviation constructed emergency airstrips at many locations.

“Apart from the regular comings and goings of the West Australian Airlines, the people of Ceduna became very aeroplane conscious in October 1929 when Australia's 'Great Aerial Pageant' passed through the aerodrome.

“In the 1930s defence aircraft often landed at Ceduna en route to Perth; in March of 1938, six RAAF Hawker Demons and one Anson bomber all landed on the same day creating great local interest. The planes were on their way to Western Australia to take part in a special aviation demonstration programme. Then, during the war years, there was much defence activity at the aerodrome, most of which was clouded in secrecy.

“The Bush Church Aid aeroplanes made much use of the aerodrome between 1938 and 1968.

“Commercially there have been many changes since West Australian Airways began passenger flights. The first was in 1936 when the WA company sold out to Adelaide Airways, which a few weeks later was absorbed into Australian National Airways (ANA).

“When planes could fly non-stop from Perth to Adelaide the special value of the Ceduna aerodrome as a stopover was lost. Since then, there has been a prolonged battle to maintain its importance with only intra-state traffic.

“This has varied from Ceduna to Adelaide direct flights, to alternatives such as Ceduna-Port Lincoln-Adelaide, (Guinea Airways 1953), Ceduna-Minnipa-Cleve-Adelaide (Airlines of SA 1971) and Ceduna-Streaky Bay-Adelaide (Kendell Airlines 1986). There have been other variations and other companies, but no long-term viability has yet been established despite slightly improving passenger numbers (e.g. 2986 in 1980-81 increasing to 3436 in 1984-85).”

Kinhill Stearns prepared the original long-term planning for the airport in the *Feasibility Study for Local Ownership of Ceduna Airport* in June 1985. The study provided guidance to Council on the feasibility and costs involved of taking over ownership of the airport from the Commonwealth Department of Civil Aviation. Included in the study were air traffic predictions and a Master Plan. The Master Plan suggested the abandoning of the existing terminal area and development of new facilities supporting development of the existing cross-runway as the future main runway for the airport.

As an incentive for Council to take over airport ownership, the Commonwealth offered to undertake various pre-transfer works. Unfortunately the pre-transfer works did not adopt the Kinhill Stearns recommendations: the existing terminal facilities were retained, the north-south runway remained a secondary gravel runway and the northwest-southeast runway was upgraded and sealed. The southwest-northeast runway was abandoned.

In July 1998 Airport Technical Services Pty Ltd published the *Ceduna Aerodrome Master Plan*. This document identified significant shortcomings in the existing airport layout, particularly in the location and layout of the terminal area and the poor wind usability of the airport due to the alignment of the main runway and a lack of a cross runway suitable for smaller aircraft such as the Metroliner. The 1998 Master Plan recommended relocation of terminal facilities to a new central location and development of the north south runway similar to the recommendation in the previous work by Kinhill Stearns.

The 1998 Master Plan was revised and reissued by Airport Technical Services as *Ceduna Airport Master Plan March 2001*. This plan was further reviewed and minor amendments/updates included in 2008.

3.3 Relationship to Other Airports

Ceduna is located on the western coastline of South Australia, approximately 800 km from Adelaide. The population, according to the 2011 census was 3,480 people. The approximate populations of some other regional centres at that same time are as follows: Port Lincoln 14,086, Port Augusta 13,985 and Whyalla 22,088.

Ceduna has the highest percentage of indigenous people of all local government areas in South Australia, with the population currently standing at 24.9% of the population (Census 2011). A number of indigenous communities in adjacent unincorporated areas rely on the available services in Ceduna and therefore, use the town as a base for a variety of reasons. These outlying communities should be considered a part of the Ceduna community.

The regional centre of Ceduna is located in the most Western Local Government area of South Australia. The area has recorded a high level of economic growth in recent times through the tourism, aquaculture and mining industries.



Figure 3.2 Location of Ceduna in Relation to Other Aviation Centres Within South Australia

3.4 Economic Significance

3.4.1 Introduction

This section is based on a study of the economic impact of Ceduna Airport by Hudson Howells (2011).

Ceduna Airport makes an important contribution to both the economy of the local region and the wider South Australian economy through employment and value-added production associated with the airport's business activities (both airport and non-airport related businesses). This is measured through a combination of business survey and economic modelling to estimate the direct and indirect (multiplier) economic benefits attributable to airport activity.

The objective of the Ceduna Airport Socio-Economic Impact Assessment was to identify the current and potential master plan impacts of the airport measured in terms of Gross State Product (GSP) and employment. This includes the flow-on or 'multiplier' impacts assessed by utilising an appropriate econometric methodology.

An economic model was developed in Microsoft Excel to assess the economic impacts. The GSP and employment impacts have been measured at two levels. Firstly the direct impact – the GSP (or value-added) and employment contribution or share associated directly with the airport (operations and master plan). Secondly the indirect impact – for example that associated with the suppliers to the companies that operate at the airport and the associated spend of wages.

Data were gathered via consultation with AAL, Council and airport management and via a survey of companies that have businesses associated with the airport, including regular airport users (e.g. SA Country Health). The survey was undertaken via face-to-face interviews in Ceduna and the survey methodology was consistent with similar surveys undertaken in the past for Adelaide and Parafield Airports.

Businesses representing the majority of airport employment were targeted for inclusion in the survey of operations. The District Council of Ceduna supplied a list of airport lessees and key airport stakeholders comprising 22 entities of which 7 employed people directly associated with airport operations who were able to supply employment and/or financial data. The remainder (15 entities) were primarily major users of the airport that do not employ persons at the airport site.

Following data collection, the direct and indirect (induced) economic impacts of the airport were assessed utilising a similar Input-Output methodology to that employed in previous Adelaide and Parafield Airport studies. This assessment incorporated the GSP (or value-added) and employment impacts of the direct and indirect expenditures associated with airport activity, measured at both the regional (Ceduna) and State levels. The potential master plan impacts were assessed based on capital cost estimated supplied by the District Council of Ceduna (based on previous designs/estimates).

In addition to measuring the level of economic activity associated with airport operations, the importance of the airport as critical regional transport infrastructure has also been assessed with corresponding estimates of economic benefits.

3.4.2 Socio-economic Background

Ceduna had a population of 3,480 people as at the 2011 ABS Census and is located on the far west coast of South Australia approximately 800 km northwest of Adelaide and 1,964 km from Perth. The township includes the nearby port of Thevenard and is situated on Murat Bay. Ceduna is set amidst grain farms, natural bush, rugged rocky bays and secluded white sandy beaches. There are several townships surrounding the Ceduna/Thevenard area including Koonibba, Smoky Bay and Denial Bay, these are all considered part of Ceduna.

Based on ABS data, Ceduna has the highest percentage of Aboriginal people of all local government areas in South Australia, with the population currently standing at 24.9% (866) of the total population, compared with 2.5% indigenous persons in Australia.

The main employment industries in Ceduna are (based on 2011 Census Data):

- Agriculture & Aquaculture: 14%
- Health Care and Social Assistance: 14%
- Retail Trade: 9.2%
- Education and Training: 8.9%
- Public Administration & Safety: 7.5%
- Accommodation & Food Services: 7.3%
- Construction: 7.2%
- Transport, Postal & Warehousing: 6.6%
- Mining: 2.8%

Agriculture & Aquaculture remain the mainstay industry in the Ceduna region. According to the District Council of Ceduna, 'during the 1850s to 1880s land around the Ceduna area was one big sheep station. In the 1890s farms were surveyed into one or two square mile blocks and clearance began to enable cereal crops to be grown and to improve pastures for grazing. Ever since that period, consolidation of farms has occurred. Today in the 2000s the average size farm would be approx. 8,000 to 10,000 acres or 12 - 15 square miles. The average farm would grow 2,500 to 3,000 acres of wheat, and would possibly have 1,200 to 1,800 sheep, and would also grow 400 to 600 acres of barley or oats. Triticale and cereal rye have been grown quite successfully. Merino sheep are predominately run for wool and meat production. Crossbred lambs are becoming more popular for meat production and some Damaras are also raised'.

Aquaculture, especially oysters, is an established industry with potential for other species such as scallops and finfish.

Public sector support including health, education and public administration account for 30.4% employment. Predominately federal, state or local government funded services, this sector also accounts for approximately 60% of airport users travelling for business reasons (Department of Transport Survey 2004).

3.4.3 The Socio-economic Impact of Airport Operations

This section estimates the level of GSP and employment generated due to the operations of the Ceduna Airport. The assessment is based on the survey of operators (including airport and ancillary operations), and economic modelling to determine an indicative measure of total activity.

The survey of operators revealed that there are 5.6 full time equivalent (FTE) employees on site (including employees of the airport itself, and in operations such as rental cars, etc.). Other businesses that interact with the airport (e.g. ground agents, taxi companies, etc.) were identified as having a total of 15.0 FTEs of employment working on business associated only with Ceduna Airport. Salary information provided indicates an average salary in the order of \$41,000 per FTE.

The airport earns average annual passenger fees of approximately \$312,036 per annum from 24,443 Rex passengers and 1,560 Pel Air passengers. Annual trends in passenger numbers are detailed in the Figure 3.3.

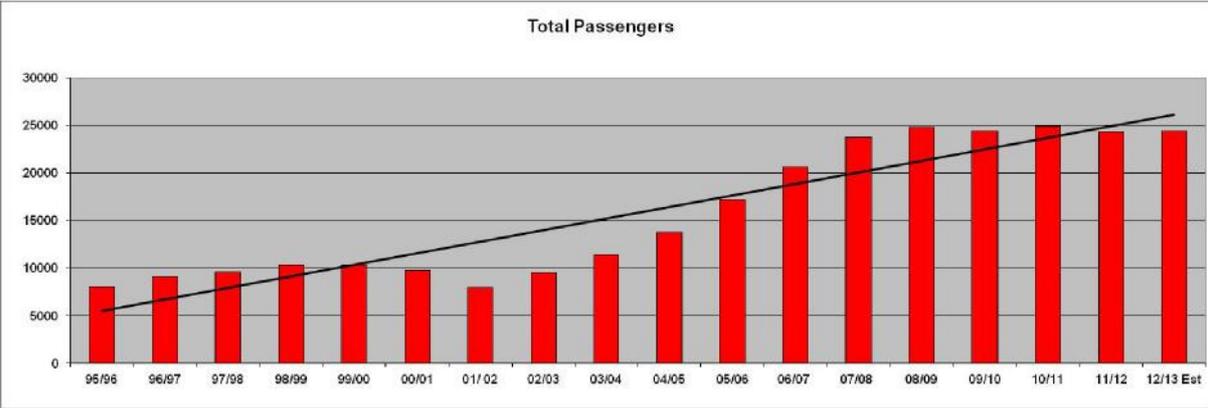


Figure 3.3 Annual Trends in Passenger Numbers

The following assumptions have been used in order to estimate the level of economic activity associated with the airport’s operations:

- The off-site employment associated with the airport is assumed to be 50% in Ceduna and 25% in Adelaide (i.e. Adelaide employment based around facilitating traffic to and from Ceduna). The survey identified the direct employment in Ceduna, and this assumption has been used in the identification of SA impacts.
- An average salary per FTE, including all on-costs, of \$49,200 has been used (i.e. \$41,000 from survey data with 20% weighting for on-costs).
- The ratio of value added to employment from the Input-Output tables has been used for this sector. Additionally the induced multipliers for the sector are used to calculate the indirect impacts.

Based on these assumptions, Table 3.1 summarises the level of economic activity associated with the operations of Ceduna Airport. The South Australian table has more detail and the multipliers and ratios for the Air Transport Sector have been used in this assessment.

Table 3.1 Economic Activity Associated with Ceduna Airport

Estimated Economic Activity	Ceduna	South Australia
Direct Employment (FTE's)	20.6	25.8
Direct Wage and Salary Income (\$'000)	1,014	1,267
Direct Value Added (\$'000)	2,978	4,464
Total Employment (FTE's)	40.1	68.6
Total Wage and Salary Income (\$'000)	2,560	4,109
Total Value Added (\$'000)	4,817	8,753

In summary, the Ceduna Airport supports 40.1 jobs (FTE's) in the Ceduna region, and generates Gross Regional Product (value added) of \$4.8 million annually (\$3.0 million in wages and salaries and \$1.8 million in Gross Operating Surplus), while at the State level it supports 68.6 FTE jobs and GSP (value-added) of \$8.7 million per annum.

3.4.4 The Socio-economic Impact of the Proposed Airport Developments

It is conservatively assumed that the proposed new developments will have a capital spend in the order of \$5 million based on:

- \$4 million for a terminal upgrade (the 2007 estimate was \$3.7 million based on plans prepared by GHD); and
- \$1 million for a runway upgrade, lighting improvements, etc.

It is also assumed that 50% of the contracts for the upgrade will be awarded to Adelaide based firms with 50% going to local Ceduna based contractors, and that 50% of the spend by Adelaide-based firms will be in Ceduna (e.g. supplies, accommodation, food, entertainment, etc.).

Based on these assumptions, Table 3.2 indicates the economic impacts estimated utilising Input-Output Multipliers for the State and the Eyre Region.

Table 3.2 Economic Activity for the State and Eyre Region

Estimated Economic Activity	Ceduna	South Australia
Direct Employment (FTE's)	12.1	13.2
Direct Wage and Salary Income (\$'000)	561	673
Direct Value Added (\$'000)	1,157	1,307
Total Employment (FTE's)	25.1	40.3
Total Wage and Salary Income (\$'000)	1,225	2,188
Total Value Added (\$'000)	2,267	3,834

Implementation of an Airport Master Plan will have socio economic implications well beyond the jobs and value-added during the construction phase. A new terminal with associated runway and lighting upgrades will offer benefits to the travelling public including business and tourism users.

Some of the possible socio-economic benefits from an upgraded airport include:

- improved facilities (and possibly services) for business and tourists including the higher yielding domestic and international travellers;
- improved air transport experience for Ceduna residents;
- improved ability to attract residents and new business to Ceduna;
- potentially new tourism operators being attracted to the region;
- potentially improved freight transport facilities and the potential for direct air access to eastern state markets for seafood; and
- air transport services for the mining industry including, for example, fly-in and fly-out services for contractors and staff.

Assuming that implementation of an Airport Master Plan incorporating terminal, runway and lighting improvements leads to a 10% improvement in socio-economic activity, the estimated potential economic impacts are indicated in Table 3.4.

Table 3.4 Estimated Economic Activity of Master Plan Implementation

Estimated Economic Activity	Ceduna	South Australia
Total Employment (FTE's)	4.0	6.9
Total Wage and Salary Income (\$'000)	256	411
Total Value Added (\$'000)	482	875

3.4.5 The Airport as Critical Regional Transport Infrastructure

The second perspective of this study is related to the role of Ceduna Airport as a facilitator and generator of economic and business activity through its transport role. The airport has facilitated an average of 24,430 passenger movements a year over the last 4 years. As shown in the Table 3.5 and 3.6, based on the Ceduna-Adelaide Air Passenger Survey report:

- 60% of travel is business related; and
- approximately 50% of travel is visitors to the region, and approximately 50% is residents of the region travelling elsewhere.

Table 3.5 Reason for Travel Between Ceduna to Adelaide

Type of Travel	Percentage
Business	60.10%
Personal	14.00%
VFR	10.40%
Leisure	8.20%
Medical	6.20%
Education	0.90%
Total	100.00%

Table 3.6 Source of Travellers Between Ceduna and Adelaide

Area of Residence	Percentage
Ceduna	47.20%
Other SA	6.20%
Adelaide	32.40%
Interstate	12.20%
Overseas	1.80%
Total	100.00%

The survey identified that passengers used the air service due to the time savings involved. Therefore it can be reasonably expected that there is value created in this context. The full cost of travelling by air is estimated using the following assumptions:

- The full length of a one-way trip is assumed to be 3.5 hours (travel to and from airport, wait time, and time on plane).
- The full opportunity cost of business travel time is based on ABS average weekly earnings (February 2011) – with an assumed 40-hour working week, and estimated at \$32.85 per hour.
- There is assumed an average cost of getting to and from the airport (taxi, or drop-off) of \$20.
- The average flight costs is estimated at approximately \$500 return (based on on-line price from Rex Airlines – prices vary and this is at the cheaper end).

The full cost of a return trip Adelaide - Ceduna is therefore estimated to be \$769.90 taking into consideration travel time and associated costs (as at February 2011).

The full cost of travel by road is estimated based on the following assumptions:

- The full length of a one-way trip is 8.9 hours (800 km, average speed of 90km per hour).
- The full opportunity cost of business travel time is based on average weekly earnings, and estimated at \$32.85 per hour.
- There is an average one-way travel cost of \$592.00 (800 kilometres by a full cost of 74c per kilometre, as per Australian Tax Office deduction allowance, and an average of 1.5 occupants per vehicle).
- Given a 17.8 hour round trip – it is assumed there would be 1 overnight stay as part of the travel. An average (across all passengers) cost of additional stay is conservatively estimated at \$50 per return trip.

The full cost of a return trip per person is therefore estimated to be \$1,620.63.

The full cost saving in travelling by air is therefore estimated to be \$850.73 per return trip.

Applying this saving to the number of trips, and assuming that non-business use is discounted to 2/3 of this amount (time not as ‘valuable’ and more flexibility), the estimated value created by travelling by air rather than by road is shown in Table 3.7.

[Table 3.7 Value of Cost Savings by Air Travel](#)

Value of Cost Savings - Maximum (\$'000)	
Business	4,796
Other	2,123
Total	6,919

However, it is noted that a road trip is not the only alternative to air travel, and people might choose not to travel (e.g. conference calls, phone links, etc). Other options have some quality costs, however the benefit/value of air travel should be discounted to take into consideration these other options.

If an indicative discount of 30% is applied, the estimated benefit/value attributable to having an airport with Adelaide-Ceduna services is as indicated in Table 3.8.

[Table 3.8 Discounted Value of Cost Savings by Air Travel](#)

Value of Air Transport Option – Indicative (\$'000)	
Business	3,358
Other	1,486
Total	4,844

3.4.6 Conclusions

In conclusion, from an operational perspective it is estimated that in the Ceduna region Ceduna Airport supports 40 jobs (FTEs) and generates Gross Regional Product or incomes of \$4.8 million annually. At the State level it is estimated that Ceduna Airport supports 69 FTE jobs and GSP or incomes of \$8.7 million per annum.

During construction, the proposed capital works is conservatively expected to generate in the order of 25 FTE jobs and \$2.3 million of value added in Ceduna.

At the State level, it is estimated that the construction will support 40 FTE jobs and \$3.8 million of value added.

Assuming that implementation of the capital works component incorporating terminal, runway and lighting improvements leads to a 10% improvement in socio-economic activity, the potential economic impacts are estimated to be 4 FTE jobs in Ceduna (6.9 in SA) and \$0.5 million of value added (\$0.9 million in SA).

As a major provider of regional transport infrastructure, it is further estimated that Ceduna Airport creates value or cost savings in the order of \$5.0 million per annum, the majority of which accrues to the business community and is estimated to be \$4.2 million per annum.

The Master Plan implementation would also be expected to increase these outcomes.

4 TRAFFIC FORECASTS

4.1 Runways and Taxiways

The primary 11/29 runway is sealed for its full length of 1740 metres and is suitable for use by aircraft up to Fokker Friendship (F27) size. The largest aeroplane regularly using the facility is the Saab SF 340 turbo prop aircraft operated by Regional Express.

The airport also receives occasional business charter flights. Recent examples of such aircraft include the Challenger 604, Dash 8-200 and Beechjet 400.

The Royal Flying Doctor Service is a frequent user of the airport with a Pilatus PC 12/45 aircraft, at an average of 23 landings per month.

The secondary 17/35 runway is of gravel construction, however with a length of only 1014 metres, the runway is generally suitable for smaller piston-engine aircraft. Light aircraft currently using the airport include Aero Commander, Cessna 210, 337G & 337H, Piper PA-31-350, etc..

The runways are connected to the apron area by:

- a sealed taxiway from the western end of the 11/29 runway; and
- a partly unsealed taxiway to the gravelled 17/35 runway.

Commuter and larger aircraft avoid use of the unsealed pavements. With a taxiway connection only to the western end of the main runway, aircraft landing from the west or taking off from the east end are required to back-track along the 11/29 runway.

4.2 Air Traffic Performance

Over the last ten years, the District Council of Ceduna has experienced significant growth in economic activity, particularly in the tourism, aquaculture and mining industries. This is reflected in growing numbers of passenger and aircraft movements (a movement is counted as one arrival or departure). Further anticipated economic growth will continue to increase traffic through the airport.

4.2.1 Regional Airline Passengers

Regional Express Airlines (REX) using 34 seat SAAB SF 340 turbo prop aircraft currently provides the Regular Public Transport (RPT) services.

RPT Revenue passenger numbers have been provided by Commonwealth Bureau of Transport and Regional Economics (BTRE) in Table 4.1 for the financial years 1996/97 to 2011/12. The figures show an overall positive trend with an average annual growth of 11.2% over the last 10 years decreasing to 3.4% over the last 5 years.

Table 4.1 Regional Passenger Movements

Year	Regional Passenger Movements		Total
	In	Out	
1996-97	4 825	4 783	9 608
1997-98	5 018	5 081	10 099
1998-99	5 441	5 422	10 863
1999-00	5 172	5 173	10 345
2000-01	4 936	4 927	9 863
2001-02	4 204	4 213	8 417
2002-03	5 169	5 129	10 298
2003-04	5 617	5 777	11 394
2004-05	6 863	6 870	13 733
2005-06	8 539	8 748	17 287
2006-07	10 284	10 393	20 677
2007-08	11 725	12 102	23 827
2008-09	12 407	12 492	24 899
2009/10	12 166	13 438	25 604
2010/11	12 200	12 546	24 746
2011/12	-	-	24 410

4.2.2 Regional Aircraft Movements

Aircraft movement numbers declined from a peak in 1998/99; with the collapse of Ansett and Kendell Airlines in 2001 and the events of September 11 of that year contributing to a continued decline through until 2002/03 when numbers began to gradually increase (see Table 4.2).

The 18 seat Metroliner was replaced with the 34 seat SAAB aircraft in 2003. Regional Express Airlines currently operate morning and late afternoon Saab flights on weekdays reducing to a morning flight only on Saturdays and an evening only flight on Sundays. This gives in theory 1248 movements for a 12-month period, which provides reasonable correlation to the 2010/11 figure below. The reduction can be attributed to the annual cutback in flights over the December/January period.

The figures suggest current seat occupancy is around 17 - 21 per flight, or 50% - 63% of the aircraft capacity. In theory the passenger numbers could increase to the order of 80% seat occupancy without the need for additional aircraft, assuming continued use of the SAAB 340.

4.2.3 General Aviation

The general aviation sector includes aircraft used for charter (business or leisure), agricultural and aerial work such as fish spotting, crop spraying and flying training.

General aviation aircraft flying into Ceduna cover a range of models including the Aero Commander, Cessna 337G & 337H, Fairchild SA227, Beech 35, Piper PA-31-350, Amateur F8L aircraft. The Royal Flying Doctor Service uses the Pilatus PC12 aircraft. The airport receives occasional visits by larger general and military aviation aircraft such as the Challenger 604, Dash 8-200, Dornier 328 and Beechjet 400.

Information on general aviation flying activity at Ceduna over the past 5 years, sourced from Avdata is provided in Table 4.3.

Table 4.2 Regular Passenger Transport Aircraft Movements

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
No. of Move-ments	992	759	812	775	1009	962	1102	1223	1207	1199	1180	1203	1189

Table 4.3 General Aviation Aircraft Movements

Year	General Aviation Movements		
	In	Out	Total
1998	2017	2 017	4 034
1999	2110	2 110	4 220
2000	1942	1 942	3 884
2001	1774	1 774	3 548
2002	1 606	1 606	3 212
2003	1 410	1 410	2 820
2004	1 776	1 776	3 552
2005	2 114	2 114	4 228
2006	1 860	1 860	3 720
2007	2 096	2 096	4 192
2008	2 126	2 126	4 252
2009	2 405	2 405	4 810
2010	2 289	2 289	4 578
2011	2573	2573	5146

The general aviation figures show an inconsistent trend, with a sharp drop in 2003 and a large increase in 2005, which was not sustained during the following year. A consistent increase year on year has been achieved since 2006, with substantial increases being realised in 2009 and again in 2011. 2010 saw a moderation of the figures.

4.3 Forecasts

Over the last 10 years the Regional Centre of Ceduna has experienced significant growth in economic activity, particularly in the tourism, aquaculture and mining industries. This is reflected in growing numbers of passenger and aircraft movements (a movement is counted as one arrival or departure). Further anticipated economic growth will continue to increase traffic through the airport.

For planning purposes, it is suggested an average annual increase in aircraft movements will range from a high of 4% down to a low of 1.5% to the year 2030. This is in part a conservative estimate but recognises that due to the local economic development in the mining tourism and aquaculture industries, some significant increases in aircraft movements may occur depending on individual major projects or a combination of such projects.

Adopting a Base growth factor of 2.5% is in accord with recent trends in aircraft movements at Ceduna Airport as shown in Table 4.3.

Forecasting for this Master Plan has therefore adopted a “Base Case” of a 2.5% increase in aircraft movements per annum for the next 20 years. By adopting the 2.5% base case, a 4% high case, and a 1.5% low case, the numbers of aircraft movements predicted for the next twenty years can be modelled. The results are shown in Table 4.4.

4.4 Runway Capacity

The current 2-runway layout at Ceduna Airport is considered capable of handling in the order of 160,000-200,000 aircraft movements per annum. For the purposes of this Master Plan a capacity figure of 180,000 has been adopted for modelling purposes. It should be noted that this figure refers to the current runway and taxiway layout and if significant changes are made to this system, then a separate Airport Capacity Study should be undertaken to revise the 180,000 estimate used in this Master Plan.

A parallel taxiway is recommended where the airport experiences in excess of 60,000 movements per annum (ICAO 1987). Using the current RPT schedule, an 80% occupancy of the existing SAAB Aircraft equates to nearly 34,000 passenger movements. Based on the high growth forecasts provided in Table 4.4 above, this figure would not be exceeded until after 2030, outside of the timeframe of this Master Plan.

Table 4.4 Forecast Numbers of All Movements (RPT and GA)

YEAR	% Annual Growth		
	HIGH	BASE	LOW
	4.00%	2.50%	1.50%
2012	5354	5277	5225
2013	5568	5409	5303
2014	5791	5544	5383
2015	6023	5683	5464
2016	6264	5825	5546
2017	6515	5971	5629
2018	6776	6120	5713
2019	7047	6273	5799
2020	7329	6430	5886
2021	7622	6591	5974
2022	7927	6756	6064
2023	8244	6925	6155
2024	8574	7098	6247
2025	8917	7275	6341
2026	9274	7457	6436
2027	9645	7643	6533
2028	10031	7834	6631
2029	10432	8030	6730
2030	10849	8231	6831
Average Daily Movements	29.7	22.6	18.7

Even though the runway capacity and the requirement for a parallel taxiway will not be reached within the time frame of this Master Plan, the present airport layout with a single sealed taxiway to the western end of the main runway can cause some delays due to aircraft being required to back track via the full length of runway 11/29 when taking off from or landing to the east. This issue is addressed in Section 7 of this Master Plan.

5 AIRCRAFT NOISE

5.1 Introduction

Noise is associated with many activities that involve a release of energy, including transport movements arising from the operation of airports. Noise from aircraft is consistently identified as the most significant environmental effect of airport operations.

The most effective means for reducing the impact of aircraft noise is through the proper planning of land use for areas adjacent to the airport. Other means include alternative runway alignments and/or adopted flight path procedures, restrictions of aircraft movements by aircraft type or the implementation of aircraft operational procedures aimed at achieving desired noise abatement objectives. The recent trend in renewing airline fleets also has the advantage that the newer aircraft types are generally much quieter than existing or older aircraft types.

The Commonwealth *Airports Act 1996* requires a Master Plan to include forecasts of noise levels resulting from the operation of the airport (*Section 71 – Contents of Draft or Final Master Plan of the Airports Act 1996*). In recent years the Commonwealth has instituted programs to protect airports from inappropriate land use around airports and these are generally based on assessments of aircraft noise generated from an airport.

There are many ways to forecast and display aircraft-related noise levels and the Australian Government has specified the use of the computer-based Integrated Noise Model (INM) which produces Australian Noise Exposure Forecasts (ANEFs) for the prediction of exposure to aircraft noise.

ANEFs are one measure to describe aircraft noise in relation to impacts on surrounding lands and communities, but recent evidence suggests that there is little relationship between noise exposure attributed to ANEF modelling and aviation-related noise complaints. Therefore, additional tools have been devised to better model and communicate areas around airports that will experience noise from aircraft.

Whilst ANEFs are required by law for Commonwealth leased Airports; Ceduna Airport is not subject to the Airports Acts. ANEC's have been produced as guidance only for future land use planning.

The District Council of Ceduna has also included in this Master Plan two additional descriptors of airport noise at Ceduna Airport:

- Aircraft Over-flight Maps showing the likely number of aircraft that will overfly specific areas round the airport from normal operations; and
- maps showing the numbers of noise events above 60 and 70 dB caused by overflying aircraft (a decibel is a direct measure of the sound pressure emanating from a defined source).

5.2 Noise Plots

ANEI, ANEF and ANEC plots are plans of the airport and surrounding localities on which contours of equal (usually 20, 25, 30 and 35) noise exposure units have been superimposed. The level of noise impact increases as the noise level value increases.

Each of the three variations of contour plans is closely related but differs in the type of base data and assumptions used in their preparation. The definitions and relationship of each type are as follows:

- ANEI (Australian Noise Exposure Index) - An ANEI is a plot of defined noise exposure based on the actual operations of the airport and uses an analysis of actual aircraft movements over a twelve-month period, usually a calendar year. It represents the best estimate of the actual noise exposure for a particular period rather than for some forecast future scenario. An ANEI is primarily used to establish a 'base case' from which an ANEF and ANECs can be developed.
- ANEF (Australian Noise Exposure Forecast) -An ANEF is a plot of estimated noise exposure based on a forecast of aircraft movements and fleet mix for a defined future horizon. The ANEF provides an indication of the change in noise emissions over time, and is used for developing appropriate land use zoning of areas affected by aircraft noise.
- ANEC (Australian Noise Exposure Concept) - An ANEC is an illustration of the aircraft noise exposure at a site using data that may bear no relationship to actual or future situations. Its primary function is to assess the noise effects of various operational or airport development alternatives. Although the land use compatibility table can be used to evaluate the ANEC values, ANEC information is not used for definitive land use planning. However, it serves as a valuable planning guide in assessing the relative impact of future development options. ANEC plots have been produced for the longterm theoretical capacity of the airport as part of this plan.

5.3 The Australian Noise Exposure Forecast System

The ANEF system is the aircraft noise exposure index currently adopted in Australia. The aircraft Noise Exposure Forecast (NEF) technique was first developed in the United States in the late 1960s and is recognised internationally. It was subsequently modified in Australia as the ANEF in 1982.

The ANEF system provides a scientific measure of noise exposure from aircraft operations around airports. It can also provide valuable guidance for land use planning in the vicinity of the airport. Table 5.1 shows the land use compatibility as recommended by Airservices Australia.

[Table 5.1 AS2021 Table of Building Site Acceptability Based on ANEF Zones](#)

ANEF Zone of Site			
Building Type	Acceptable	Conditionally Acceptable	Unacceptable
House, home unit, flat, caravan park	Less than 20 ANEF (Note 1)	20 to 25 ANEF (Note 2)	Greater than 25 ANEF
Hotel, motel, hostel	Less than 25 ANEF	25 to 30 ANEF	Greater than 30 ANEF
School, university	Less than 20 ANEF (Note 1)	20 to 25 ANEF (Note 2)	Greater than 25 ANEF
Hospital, nursing home	Less than 20 ANEF (Note 1)	20 to 35 ANEF	Greater than 25 ANEF
Public building	Less than 20 ANEF (Note 1)	20 to 30 ANEF	Greater than 30 ANEF
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industry	Less than 25 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

Notes:

1. The actual location of the 20 ANEF contour is difficult to define accurately, mainly because of variation in aircraft flight paths. Because of this, the procedure of Clause 2.3.2 in AS2021 – 2000 may be followed for building sites outside but near to the 20 ANEF contour.
2. Within 20 ANEF to 25 ANEF, some people may find that the land is not compatible with residential or educational uses. Land use authorities may consider that the incorporation of noise control features in the construction of residences or schools is appropriate (see also Figure A1 of Appendix A in AS2021 – 2000).
3. There will be cases where a building of a particular type will contain spaces used for activities which would generally be found in a different type of building (e.g. an office in an industrial building). In these cases Table 7.1 should be used to determine site acceptability, but internal design noise levels within the specific spaces should be determined by Table 3.3 in AS2021 – 2000.
4. This Standard does not recommend development in unacceptable areas. However, where the relevant planning authority determines that any development may be necessary within existing built-up areas designated as unacceptable, it is recommended that such development should achieve the required ANR determined according to Clause 3.2 in AS2021 – 2000. For residences, schools etc., the effect of aircraft noise on outdoor areas associated with the building should be considered.
5. In no case should new development take place in greenfield sites deemed unacceptable because such development may impact airport operations.

The ANEF computation is based on forecasts of traffic movements on an average day. Allocations of the forecast movements to runways and flight paths are on an average basis and take into account the existing and forecast air traffic control procedures at the airport which nominate preferred runways and preferred flight paths for noise abatement purposes.

The following factors of aircraft noise are taken into account in calculating the ANEF:

- the intensity, duration, tonal content and spectrum of audible frequencies of the noise of aircraft takeoffs, landings and reverse thrust after landing (the noise generated on the airport from ground running of aircraft engines or taxiing movements is not included for practical reasons);
- the forecast frequency of aircraft types and movements on the various flight paths;
- the average daily distribution of aircraft takeoffs and landing movements in both daytime (7am to 7pm) and night time (7pm to 7am) hours; and
- the topography of the area surrounding the airport.

5.4 Calculation of The ANEF

The ANEF system combines noise level and frequency of operations to calculate the average noise level at any point along and to the side of the flight path using the following reasonably simple mathematical procedure.

Partial ANEFs are calculated for the frequency of number of night-time and day-time operations of each aircraft type and flight path. These calculations use a value of Effective Perceived Noise level (EPNL) for each aircraft and take into account all known annoying aspects in the temporal, frequency spectrum and spatial domain.

The EPNL level is obtained by the algebraic addition of the maximum perceived noise level at any instant corrected by noise tonal and duration factors. The EPNL unit is also used for the international certification of new aircraft. These Partial ANEF values are computed for each significant type of noise intrusion. The total ANEF at any point on the ground around the airport is composed of all individual noise exposures (summed logarithmically) produced by each aircraft type operating on each path over the period of one day. These calculated values do not take account of any background noise levels from road or rail activities.

5.5 Noise Threshold Levels

The effects of noise can range from minor to very serious depending on the noise level, its duration and the subject's sensitivity. Noise, by definition being unwanted sound, elicits a wide range of individual responses in the vicinity of airports and the reasons for the differences between individuals are largely socially-based and complex to quantify. Research has indicated however, that, unlike an individual's reaction, community response to noise impact issues is more predictable.

In the area outside the 20 ANEF contour it is generally accepted that noise exposure is not of significant concern, although there will be some individual exceptions. Within the area between the 20 and 25 ANEF contour, levels of noise are generally accepted to emerge as an environmental problem, and within the 25 ANEF contour the noise exposure becomes progressively more severe. Table 5.1 compares land use to acceptable ANEF contour levels.

It should be noted that the actual location of the 20 ANEF contour is difficult to accurately define. This is because variations in actual flight paths, pilot's operating techniques, meteorological conditions and topography all have a largely unpredictable effect on the position of the 20 ANEF contour for any given day.

5.6 The Integrated Noise Model

Studies of aircraft noise impacts presented for Ceduna Airport were carried out using the United States Federal Aviation Administration (FAA) approved Integrated Noise Model (INM) Version 7.0a.

This internationally recognised, computer-based noise simulation model calculates contours from an analysis of the contribution the various defined aircraft and their operations have on the overall noise emissions from the airport. The resulting noise 'footprint' can then be used to assess the relative impacts different aircraft fleets and/or operational procedures have on the surrounding environs.

The INM model contains a database of civil passenger and military aircraft along with their performance and typical noise characteristics. Two ANEF/ANEC scenarios were modelled as part of these studies:

- 'Base' forecast for 2030; and
- The Ultimate Capacity ANEC (based on the estimated 180,000 movements data).

The numbers for each of these forecasts were scaled from 2010 movement numbers and depended on assigned aircraft categories.

5.7 Flight Movements

The number of flights operating from Ceduna Airport in the future is discussed in the previous section (Chapter 4). The numbers of flights used in the noise modelling were the "Base Case" values for both the 2030 and the estimated capacity modelling. These are provided in Table 5.2.

[Table 5.2 Forecast Movements in 2030 and at 180,000 Movements per annum](#)

INM Code	Aircraft Types	Total Annual Movements in 2030	Est. Capacity Movements
General Aviation			
LEAR25	525 525 CESSNA	204	4460
MU3001	550 550 CESSNA	24	525
BEC58P	500 500 Commander AERO COMMANDER	1400	30605
CNA441	340 340 CESSNA	214	4678
GASEPF	PA-3 Cub Trainer 3 PIPER	526	11499
GASEPV	210 210 Centurion CESSNA	2170	47437
DHC6	SA22 SA227-TT SWEARINGEN	386	8438
HS748A	F27 Friendship; Conair F-27 Firefighter FAIRCHILD	4	87
DHC830	DH8D Dash 8 - 400 DE HAVILLAND CANADA	2634	57581
Helicopters			
B407	Bell 407	168	3673
EC130	Eurocopter EC-130	168	3673
R22	Robinson R22B	168	3673
SC300C	Schweizer	168	3673
Total Annual		8234	180,000

Note: Where figures have been rounded discrepancies may occur between totals and the sums of component items.

5.8 Fleet Mix

The fleet mix of aircraft operating from Ceduna Airport twenty years or more into the future cannot be defined exactly. At best, the mix of aircraft using the airport in the future can only be inferred from current fleet mixes and an assessment of the types of aircraft being purchased or manufactured for similar routes and passenger capacities.

The expected fleet mix for RPT, charter and general aviation that were used for the modelling are provided in Table 5.2, and for the majority of the movements generally reflect the current fleet mix.

5.9 Runways

The existing primary 11/29 runway is sealed for its full length of 1740 m and is suitable for use by aircraft up to Fokker Friendship (F27) size. The largest aeroplane regularly using the facility is the Saab SF 340 turbo prop aircraft operated by Regional Express.

The existing secondary 17/35 runway is of gravel construction, however with a length of only 1014 m, the runway is generally suitable for smaller piston-engine aircraft. Light aircraft currently using the airport include Aero Commander, Cessna 210, 337G & 337H, Piper PA-31-350, etc.

Modelling for this Master Plan has been based on a scenario of extending and upgrading the existing 17/35 runway into the main runway facility for the airport. Development of the runways is described in more detail in section 7 of this Master Plan. Initial planning allows for re-construction of 17/35 to a 1500 m long sealed runway, with provision for an ultimate length of 2000 m if ever required in the future.

5.10 Flight Paths

The impacts of aircraft noise will be greatly affected by the flight paths that are used by aircraft approaching the airport or after takeoff. The flight paths used are determined by the runway used (discussed previously) and the destination of the flight. Generally, the tracks used by aircraft have been chosen to limit the impact of noise on surrounding land uses, but within the bounds of operational guidelines and safety standards.

Airport parameters and flight tracks were derived primarily from charts supplied by Airservices Australia. Flight tracks were described in INM, and movements were allocated to these tracks by apportioning movements to runways, and then allocating movements to each runway to the tracks for that runway. The District Council of Ceduna confirmed the runway allocations.

5.11 Modelling Results

Map showing the ANEF contours for the numbers of aircraft movements expected in 2030 is shown in Figure 5.1.

A map showing the ANEC contours for 180,000 movements is shown in Figure 5.2.

5.12 Alternative Representation of Aircraft Noise Impacts

5.12.1 Aircraft Over-flight Maps

For General Aviation airports in Australia with large numbers of flights by training aircraft, the ANEF system is recognised as having limited applicability in defining which areas of surrounding lands may be affected by aircraft noise. The location of over-flights and the frequency of planes flying overhead is often the cause of noise complaints being registered with authorities.

To address this concern, it is possible to calculate the number of times an area, particularly an existing residential area, is likely to be over-flown on an average operating day at the airport by using the refined maps of arrivals and departures flight tracks and the detailed maps of any circuits.

Maps showing the location of the probable over-flights and the numbers of these flights per “average” day for Ceduna Airport operating at 2030 and at 180,000 movements are presented in Figures 5.3 and 5.4 respectively.

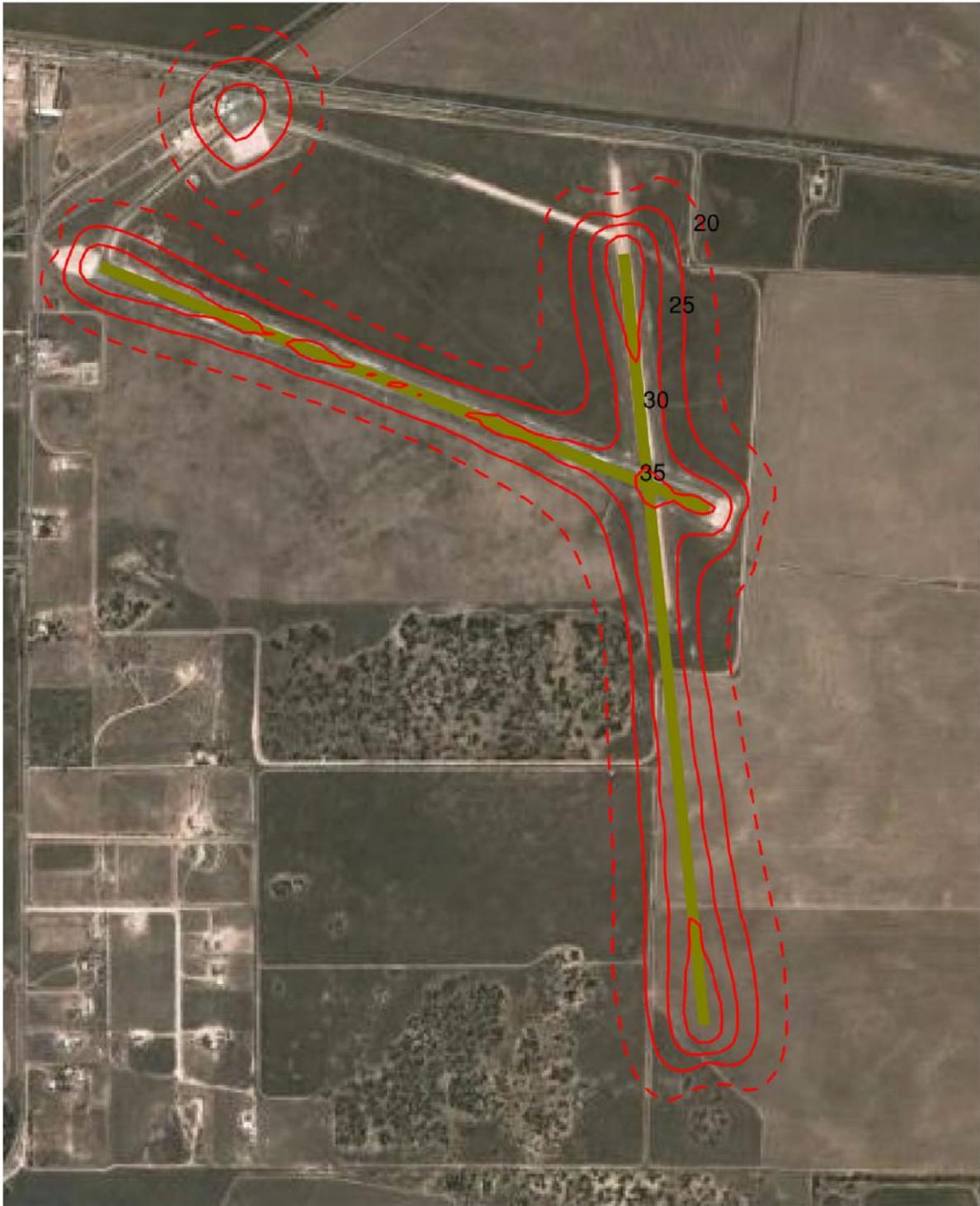


Figure 5.1 2030 ANEF Contours



Figure 5.2 ANEC Contours for the Estimated 180,000 Movements

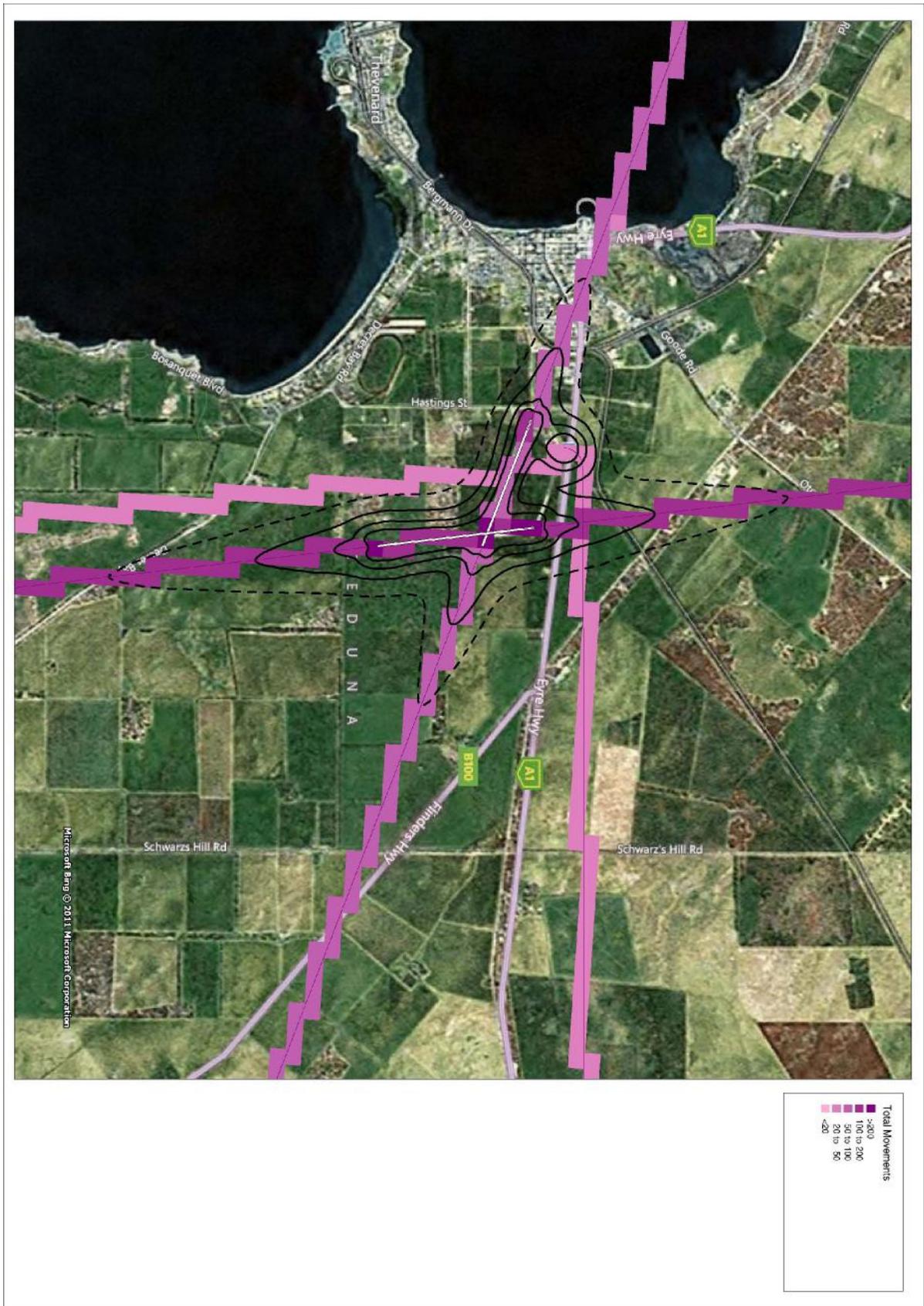


Figure 5.4 Aircraft Over-flight Map for 180,000 Movements

This method of demonstrating flight noise and activity for a “capacity estimate” is based on 180,000 movements. This capacity may never be reached but is a realistic figure that indicates the maximum aeronautical potential of the current airfield in its current configuration. Therefore, in a worst-case scenario and by using colour graduation, the over-flight diagrams indicate (purely as a guide) the likely number of over-flights that could be expected to be experienced now and in the future. In that regard, these over-flight maps are a reasonably accurate representation of what is most likely to be experienced in the worst-case scenario of the airport reaching its capacity in the years after 2030.

However, whilst all reasonable care has been taken to depict these over-flights, there are a number of external influences that may affect the actual performance of an individual aircraft in flight including:

- variations in individual aircraft;
- variations in turning circles and cruise speeds by aircraft (like those of motor vehicles);
- wind direction and strength;
- atmospheric pressure;
- air temperature;
- performance of different aircraft types;
- human variation;
- amount of traffic in the area and the need to maintain safe separation;
- training requirement to fly different circuits and landing techniques which involve varying angles of descent; and
- instruction from Air Traffic Control in relation to traffic departing or arriving from Ceduna Airport.

Accordingly, these figures are provided to assist persons in the areas identified to understand what is occurring and/or to make a considered decision in respect of likely over-flights now or in the future. These figures can be used by prospective property purchasers to estimate the likely over-flights in any particular area around the airport and by land use planners when considering the suitability for future zonings and re-zonings.

5.12.2 Noise Event Modelling

The aircraft over-flight maps presented in Figures 5.3 and 5.4 provide an estimate of the number of aircraft that are likely to fly over particular areas surrounding the airport on an average day. N60 and N70 modelling provides maps of areas that are likely to experience a predicted number of noise events from aircraft flying overhead. N60 noise modelling computes the number of noise events greater than 60 dB(A) on the “average” day over particular areas. Similarly, N70 maps represent the number of noise events greater than 70 dB(A) on the “average” day over the same areas. These maps allow stakeholders to interpret aircraft noise issues based on actual counts of aircraft with noise profiles greater than 60 and 70 decibels over the flight paths that aircraft use around Ceduna Airport.

N60 and N70 maps for Ceduna Airport for 180,000 movements are presented in Figures 5.5 and 5.6.



Figure 5.6 N60 map for Ceduna Airport at 180,000 Movements



Figure 5.7 N70 Map for Ceduna Airport at 180,000 Movements

5.13 Aircraft Noise Mitigation

The ANEF for 2030 (Figure 5.1) and the ANEC for ultimate capacity (Figure 5.2) show that there may be some increase in the residential areas around Ceduna affected by airport noise with the increased air traffic expected in the future. These impacts will be alleviated to some degree by the gradual replacement of the existing fleet with quieter aircraft and the movement of traffic to the extended and upgraded 17/35 runway.

The long-term land use planning of the airport and surrounding areas, particularly those associated with the ANEF contours produced at Figures 5.1 and 5.2 is being addressed by the District Council of Ceduna.

The South Australian Government has commenced a process to implement planning protections in Council development plans to ensure that proper account is taken of aircraft noise. This process has been given a priority and the Commonwealth through the National Airports Safeguarding Advisory Group (NASAG) has commenced a process with the States to formally recognise aircraft noise-affected areas around airports and to zone such lands for uses that do not affect the long-term viability of the aviation infrastructure.

The District Council of Ceduna is participating in these discussions and is aware of the need for such planning reforms.

6 LAND USE PLANNING

6.1 Introduction

The land use provisions of this Master Plan are based on the Ceduna Council Development Plan consolidated on 12 January 2012.

The Master Plan also takes into account various State, Regional and Local Government strategic directions, planning policies and legislative frameworks

This Master Plan recognises that Ceduna Airport is an important regional aviation facility for western South Australia with considerable potential for future development. It seeks to ensure that:

- airport development proceeds in a manner which is compatible with existing adjacent land uses and development policies;
- the operational integrity and economic viability of the airport is not compromised by surrounding development; and
- the airport has capacity to expand to meet future growth in regional travel, tourism and the expansion of the mining sector.

Although development on the airport land is assessed under the Development Act 1993, the Master Plan establishes a Master Plan Framework that provides a more detailed framework to guide future development on airport land.

6.2 State, Regional and Local Government Planning Frameworks

Various State, Regional and Local Government strategic directions, planning policies and legislative frameworks guide future development within the region, within and around the Ceduna township, and will directly impact and influence the future growth and development of the Ceduna Airport.

At a State-level, the following Planning Frameworks are relevant to the region:

- SA Strategic Plan;
- Strategic Infrastructure Plan for SA;
- Development Act and Development Regulations; and
- Eyre and Western Region Plan (A volume of the South Australian Planning Strategy).

At a regional level, the Whyalla and Eyre Peninsula Regional Economic Development Board has recently released the Regional Plan – Whyalla and Eyre Peninsula.

There are also a number of Council-level Planning Frameworks that need to be considered:

- District Council of Ceduna Strategic Plan; and
- District Council of Ceduna Development Plan.

These documents are summarised below, highlighting their relationship and impact on the Ceduna Airport.

6.2.1 State Level Planning Frameworks

South Australia's Strategic Plan (2011)

South Australia's Strategic Plan was first released by the South Australian Government in March 2004 and updated in 2007 and 2011. The Plan's targets reflect South Australia's aspirations for where it wants to be as a State in 2020 and beyond.

Targets are grouped under the following six objectives:

- Growing Prosperity;
- Improving Wellbeing;
- Attaining Sustainability;
- Fostering Creativity and Innovation;
- Building Communities; and
- Expanding Opportunity.

Future development and expansion of the Ceduna Airport land will assist in growing prosperity for the western region of South Australia, improving accessibility and supporting the growth of the mining and tourism sectors.

Relevant targets, taken direct from South Australia's Strategic Plan 2011, that apply to the Eyre and Western Region are listed below:

Our Community

Goal: We are known worldwide as a great place to live and visit.

Target 4: Tourism industry – increase visitor expenditure in South Australia's total tourism industry to \$8 billion.

Prosperity

Goal: we develop and maintain a sustainable mix of industries across the state.

Target 41: Minerals exploration – exploration expenditure in South Australia to be maintained in excess of \$200 million per annum until 2015.

Target 42: Minerals production and processing – increase the value of minerals production and processing to \$10 billion by 2020.

Goal: South Australia has a sustainable population.

Target 46: Regional population levels (increase from 20,000 to 320,000 or more by 2020).

Goal: South Australia's transport network enables efficient movement by industry and the community. Target 56: Strategic infrastructure.

In seeking to achieve the targets of the SASP, the Eyre and Western Region, and more specifically the township of Ceduna, will need to accommodate projected population growth and expansion of industries such as mining and tourism.

Strategic Infrastructure Plan for SA 2004/2005 – 2014-2015

The current *Strategic Infrastructure Plan for South Australia* (SIPSA) was released in 2005 and provides a coordinated approach to the provision of State infrastructure until 2015. The SIPSA outlines a set of strategic priorities for the delivery of the State's infrastructure, and provides a Regional Overview section for the Eyre Peninsula.

Whilst there is no specific reference to Ceduna Airport or future projects for the airport, the SIPSA recognises the importance of tourism to the region and the requirement of adequate airport facilities to accommodate the anticipated growth of tourism in coming years.

In addition, the SA Government has recently released the Strategic Infrastructure Plan for SA Discussion Paper. The Discussion Paper has been prepared to provide an overview of progress in infrastructure development and the key challenges and opportunities to be considered in future planning for 14 infrastructure sectors. It also identifies the long-term strategic priorities to guide decisions on infrastructure planning and development over the next 10 to 15 years and beyond, with the most relevant priority being to:

“Develop energy and transport infrastructure, including ports, to support economic growth, particularly in the agricultural, minerals and tourism sectors.”

Development Act 1993 and Development Regulations 2008

The South Australian planning system is established under the *Development Act 1993* and associated *Development Regulations 2008*. The object of the Development Act is to provide for the proper, orderly and efficient planning and development in the State.

Amongst other aims, the Act provides for:

- the establishment of objectives and principles of planning and development;
- a system of strategic planning governing development;
- the creation of Development Plans with policies to guide and control development;
- appropriate public participation in the planning process and the assessment of development proposals; and
- the establishment of various decision making bodies.

The Act requires the preparation of the *Planning Strategy for South Australia*. The Planning Strategy is integrated with, and should be read in conjunction with, other specialist plans, including the *Strategic Infrastructure Plan for South Australia*. The Planning Strategy provides a physical and policy framework to assist in reaching the various targets outlined in South Australia's Strategic Plan. The Act requires that Development Plans should seek to promote the provisions of the Planning Strategy.

Eyre & Western Region Plan (A Volume of the South Australian Planning Strategy)

The *Planning Strategy for South Australia* is the overarching policy established by the SA Government to guide the future land use and development of the State. The Planning Strategy has been updated over the past few years and is now divided into a number of volumes for both metropolitan and regional SA.

The *Eyre and Western Region Plan*, a Volume of the Planning Strategy, contains the guiding vision and policies for the region. The Plan was released in 2011 for public consultation, and was finalised and gazetted on 26 April 2012.

The Plan identifies a number of principles and policies to realise the vision for the Eyre and Western Region. The key aims of the Plan relevant to the Ceduna area include:

- balance the social, economic and environmental demands of the region;
- maximise the region's competitive advantage in renewable energy, mining, tourism and aquaculture;
- accommodate the region's anticipated population growth; and
- manage and facilitate existing and planned infrastructure to maximise economic development and job growth.

Several overarching principles contained within the Regional Plan are particularly relevant to the growth and future development of Ceduna Airport:

- Principle 4: Protect and build on the region's strategic infrastructure;
- Principle 8: Reinforce the region as a unique and diverse tourism destination;
- Principle 10: Ensure commercial development supports town function; and
- Principle 11: Plan and manage township growth, and develop Structure Plans for key growth centres.

The Plan also recognises that the region has several significant airports, all of which are owned and operated by local government, with Whyalla, Port Lincoln and Ceduna airports all requiring redevelopment if they are to meet growing industry and tourism demands and associated safety and security standards.

Finally, in relation to the future development of Ceduna, the Plan states:

“As the western Eyre Peninsula's major commercial service centre, Ceduna should be a focus for facilities and services, while accommodating population growth. It should also have a supply of serviced industrial land.

Ceduna may also need to accommodate export and processing facilities associated with any discoveries resulting from mining exploration.”

6.2.2 Regional Planning Frameworks

The Whyalla and Eyre Peninsula Regional Economic Development Board released the *Regional Plan – Whyalla and Eyre Peninsula* in August 2012.

The Regional Plan provides an overview of the social, economic, environmental and cultural attributes of the Whyalla and Eyre Peninsula region, along with the planning framework for the long-term strategic development of the region.

Section 8.4 of the Plan relates to regional airports. The Plan provides the following information in relation to Ceduna Airport:

“Ceduna Airport is the largest regional airport on the west coast of Eyre Peninsula. The facility provides public landing strips and associated infrastructure for passenger transport and general aviation operators. The main 1,737 metre long runway is sealed and has the capacity to support Fokker F27 48 seater aircraft and DASH 8 50 seater aircraft. The second 1,006 metre runway has a gravel surface and is largely used for light aircraft.

Over the past 5 years Ceduna Airport has experienced a significant 54.7% growth in RPT numbers with in excess of 20,000 people using air services regularly. The airport is the major conduit for the FIFO workforce at Iluka Resource's Jacinth Ambrosia mine located about 80kms north of Yalata. This \$2 billion mineral sands mine has had a significant economic impact on Ceduna with 120 people employed at the site since establishment in 2008-9.

Due to the growing passenger numbers, the RPT operator (Rex, Regional Express) has increased the frequency of air services. The airport infrastructure is subsequently operating at full capacity, particularly during peak travel periods, and is clearly inadequate for existing and projected use.

Ceduna District Council has prepared a Master Plan for the facility upgrade which recommended a three staged development including the construction of a new terminal building; provision of a new taxi way, apron and runway, and construction of associated commercial servicing facilities. Ceduna Council is reviewing the master plan to determine more cost effective options. The possibility of operating the airport via Adelaide Airport management is being considered as part of this process."

6.2.3 Council Level Planning Frameworks

Ceduna Strategic Plan 2011 - 2014

The purpose of the Ceduna Council Strategic Plan is to map out a longer-term vision, goals and strategies for the community, economy and environment, and to meet Council's governance and organisational responsibilities. The strategies developed in this Plan seek to achieve Council's vision for Ceduna and the outcomes for the local community.

The Strategic Plan has set the following Vision and Mission statement for the Council area:

Vision: Ceduna – an industrious, prosperous community in an enriching and pristine environment

Mission: To deliver economic, social and environmental prosperity for the community through consultation, leadership and the provision of high quality services.

The Strategic Plan predicts that the population of the Ceduna Council area will grow by more than 40% over the next 10 years to 5,964 persons by 2021. In order to meet the requirements of this projected population, and to achieve Council's Vision, a number of Goals and expected Outcomes have been set in the Strategic Plan. Those most relevant to the Ceduna Airport are discussed below:

Goal 1: Physical infrastructure is improved and developed Outcomes:

1.6 - Improved airport infrastructure and services

1.9 - Improved tourism infrastructure

Goal 3: Sustainable economic development opportunities identified, vigorously pursued and promoted

3.1 - Growth of new and existing industries and businesses

3.2 - Increased tourism

3.4 - Land developed to meet future needs

Specifically, Outcome 1.6 of the Plan seeks “Improved airport infrastructure services”, with detailed outcomes including:

- Review and implement Airport Master Plan and Business Plan and Development Plans
- Maintain airport infrastructure and services

The preparation of this Master Plan for Ceduna Airport is helping to achieve Outcome 1.6 of the Strategic Plan, and further development of airport infrastructure in future will help to realise the Goals and Outcomes set out in the Strategic Plan.

Ceduna Council Development Plan

Development Plans are the statutory documents that guide development within each of the Local Government Areas of South Australia. The Development Act 1993 sets out the requirements of Councils to prepare a Development Plan for their region, the information that must be included in the Development Plans, and the process to make amendments. Development Plans are regularly amended to reflect updates to the SA Planning Strategy and the changing needs and objectives of the relevant Council.

Essentially Development Plans are used to inform residents and developers of the type of development that is envisaged in their particular area. Development applications lodged with the relevant planning authority are assessed against the relevant Objectives and Principles of Development Control contained within the Development Plan.

The Ceduna Council Development Plan, consolidated 12 January 2012, is the relevant statutory document that must be referred to when preparing and assessing a development application for development on the Ceduna Airport site.

6.3 Statutory Planning Framework

The Ceduna Council Development Plan has recently been updated to conform to the SA Government’s ‘Better Development Plan Program’. This program seeks to simplify the format of Development Plans across the State, providing standardised planning Objectives, Principles of Development Control and Zones; allowing local variation where applicable.

The Ceduna Airport is located in the Airfield Zone, with the southeastern section of the Zone being designated in a Policy Area – ‘Deferred Aviation Policy Area 1’ (see Figure 6.1 below).

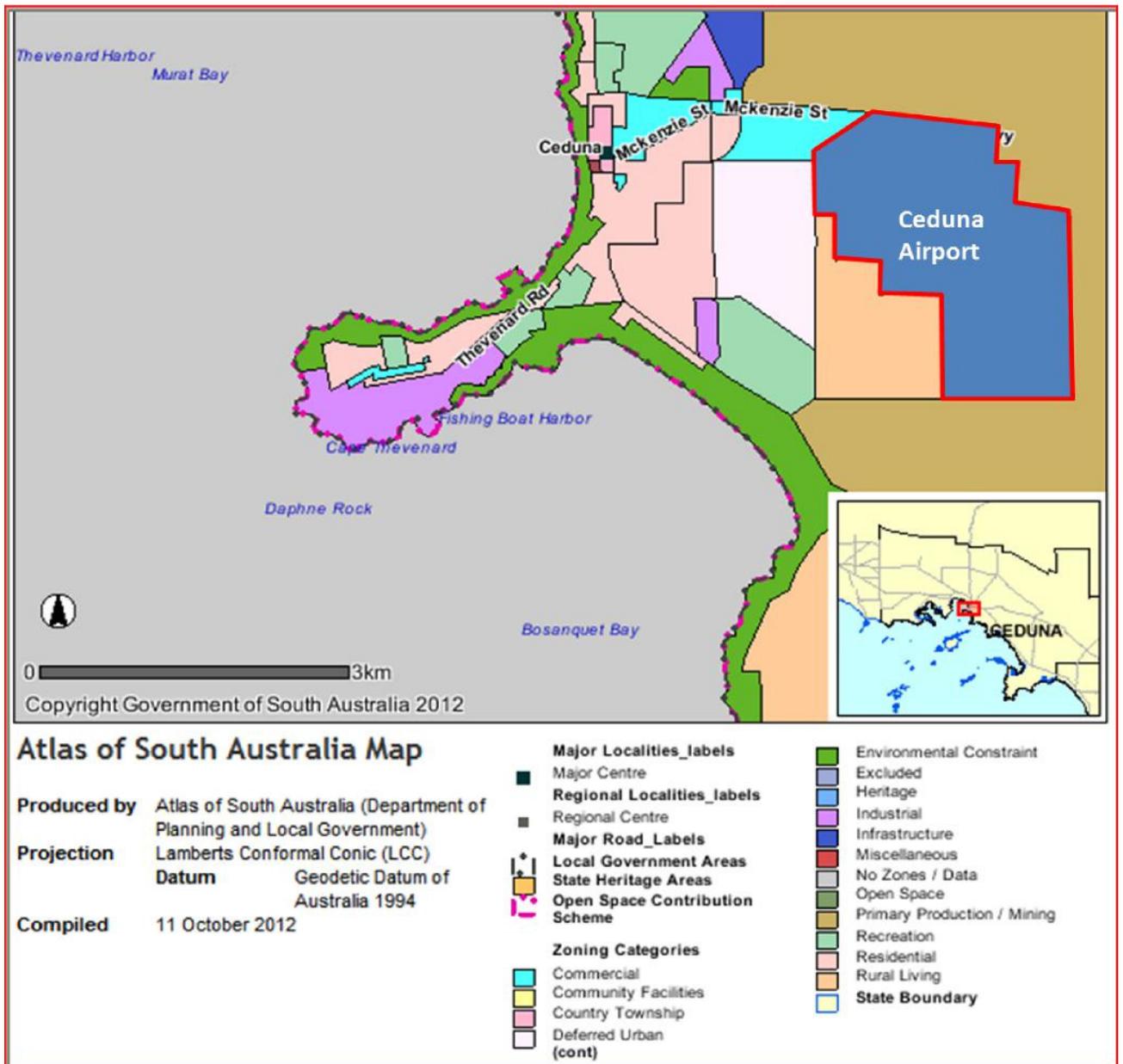


Figure 6.1 Zones and Policy Areas for Ceduna Airport, Atlas SA 2012

6.3.1 Development Plan Policies

Airfield Zone and Deferred Aviation Policy Area 1

Details of the Airfield Zone, as contained in the Ceduna Development Plan, consolidated on 12 January 2012, are provided below:

Airfield Zone

Refer to the [Map Reference Table](#) for a list of the maps that relate to this zone.

OBJECTIVES

- 1 A zone primarily accommodating aircraft operations, passenger terminals, airport and aviation-related light industrial, service industrial, warehouse and storage purposes.
- 2 Development that contributes to the desired character of the zone.

DESIRED CHARACTER

The zone's primary purpose is to accommodate the future growth and development of the Ceduna Airport. Given the significance of the airport for the greater region, it is envisaged that undeveloped land in the vicinity will be held in abeyance to facilitate any future expansion of its operations.

Business and enterprise development that is not related to airport operations is only envisaged where it will maintain and facilitate the economic use of the land and will be compatible with the current and future use of the land for airport activities

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

The following forms of development are envisaged in the zone:

- air freight logistics and storage facilities
 - air passenger or air freight terminal
 - aircraft related facilities
 - airport
 - fuel depot
 - light industry ancillary to and in association with aviation activities
 - offices within or adjacent the terminal building
 - recreation area
 - service industry ancillary to and in association with aviation activities
 - shop within or adjacent the terminal building
 - warehouse ancillary to and in association with aviation activities.
- 2 Development listed as non-complying is generally inappropriate and not acceptable unless it can be demonstrated that it does not undermine the objectives and principles of the Development Plan.
 - 3 Development that would be adversely affected by noise and other hazards caused by airport activities should not be undertaken in the zone.
 - 4 Development should not impede the use of the zone for aviation purposes.

Form and Character

- 5 Development should not be undertaken unless it is consistent with the desired character for the zone.

Ceduna Council
Zone Section
Airfield Zone

- 6 Commercial and light industrial development located on the airport site should:
- (a) facilitate the more efficient operation of the airport
 - (b) be sited in defined clusters
 - (c) not adversely affect the amenity of surrounding land uses
 - (d) be located in close proximity to the terminal building but having regard to future expansion of the terminal.
- 7 Development within the zone should use the existing airport access road and not gain additional access directly from the Eyre Highway.

Land Division

- 8 Land should not be divided except for the realignment of allotment boundaries where this assists in the more efficient operation and use of the airport.

Deferred Aviation Policy Area '1

Refer to the [Map Reference Table](#) for a list of the maps that relate to this policy area.

OBJECTIVES

- 1 A policy area accommodating land for future airport operations.
- 2 A policy area primarily accommodating rural uses such as broadacre cropping and grazing that will not prejudice the future development of the land for aviation purposes_
- 3 Development that maintains the open character and form of the land within the policy area so as not to compromise ongoing and future airport operations.

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

1 The following forms of development are envisaged in the policy area:

- airport infrastructure
- broadacre cropping
- grazing.

2 Development should not be undertaken if it will be prejudicial to the use of the land for aviation purposes_

3 Buildings and structures, other than for aviation, should not be developed within this policy area.

4 Development should be designed and located to maintain the safe operation of the airport_

5 Development which would be adversely affected by noise and other hazards caused' by aircraft movements should not be undertaken_

Land Division

6 Land division should not occur unless it is in the form of an alteration to the boundaries of an allotment and no additional allotments are created in the policy area.

7 The alteration of allotment boundaries should occur only to

- (a) correct an anomaly in the placement of allotment boundaries with respect to the location of existing buildings or structures
- (b) improve the management of the land for the purpose of primary production
- (c) enable the provision of public infrastructure or aviation uses_

PROCEDURAL MATTERS

Complying Development

Complying developments are prescribed in Schedule 4 of the *Development Regulations 2008*.

Non-complying Development

Development (including building work, a change in the use of land, or division of an allotment) for the following is non-complying:

Form of Development	Exceptions
Community centre	
Consulting room	
Dwelling	
Educational establishment	Except where ancillary to and in association with aviation activities.
General industry	
Hospital	
Hotel	
Intensive animal keeping	
Land division	Except where no additional allotments are created.
Motel	
Nursing home	
Place of worship	
Pre-school	
Shop or group of shops	Except where: (a) located within or adjacent to a terminal building (b) the total gross leasable floor area is less than 150 square metres.
Special industry	
Tourist accommodation	
Waste reception, storage, treatment or disposal	

Public Notification

Categories of public notification are prescribed in Schedule 9 of the *Development Regulations 2008*.

As listed in the Procedural Matters section of the Airfield Zone, there are no 'complying' forms of development in the Zone aside from those listed in the Development Regulations 2008. However, there are a number of 'non-complying' forms of development listed, including various forms of residential development, educational and community uses, and various forms of industry.

General Section

The Ceduna Council Development Plan General Section includes the following elements that are particularly relevant to development on and adjacent Ceduna Airport:

- Building near Airfields;
- Interface between Land Uses; and
- Transportation and Access.

Building Near Airfields

The intent of the policies in this Section is to ensure that appropriate development occurs near airfields – in this case the Ceduna Airport site. The Section discusses the Obstacle Limitation Surfaces and refers to the current Concept Plan Map (shown in Figure 6.2) that stipulates the maximum building heights of buildings near airfields. A revision of the Concept Plan Map including new OLS chart will be undertaken during the Plan Amendment Report for the Airport.

Reference is also made to potential hazards to the operation of the airport including lighting, attraction of birds and minimising the impact of noise created by the airport to nearby dwellings.

Interface between Land Uses

This Section provides guidance about reducing the potential impacts of different land uses within close proximity or sharing boundaries for example. Some of the potential impacts are similar to those listed in the 'Building Near Airfields' Section, and specific reference is made to minimising the impacts of new development on other development that is appropriate and envisaged in the area.

Principle of Development Control 6, which is of direct relevance to Ceduna Airport, states that:

“Sensitive uses likely to conflict with the continuation of lawfully existing developments and land uses considered appropriate for the zone should not be developed or should be designed to minimise negative impacts.”

Other provisions relate to noise attenuation measures and the rural interface, which should be considered in future development of and around the airport.

Transportation and Access

The Transportation and Access Section encourages an integrated and efficient transport system that accommodates a range of transport modes. Development is encouraged to integrate with existing transport networks, and new land uses should support the efficient provision of a sustainable transport system within the Council area. Provisions for the appropriate arrangement and access to car parking areas are provided, with reference to the Council's table of required car parking numbers.

There are no policies within this section that specifically relate to development on the Ceduna Airport site.

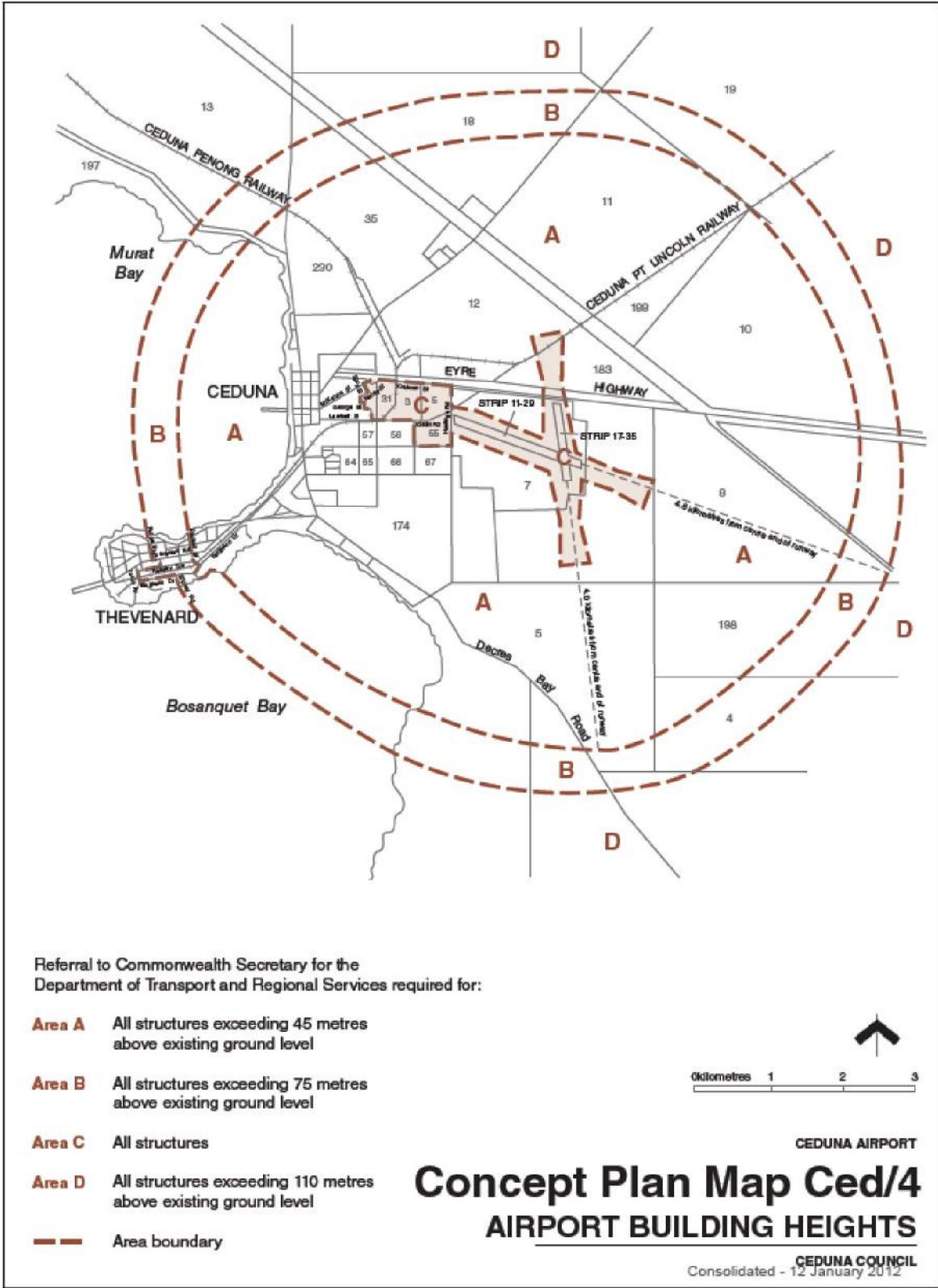


Figure 6.2 Current Airport Building Heights Map showing OLS Zones

6.4 Development Approval Process

As Ceduna Airport is currently owned and operated by the District Council of Ceduna, any development as prescribed in Section 4 of the Development Act 1993 must be assessed against the relevant provisions of the Council's Development Plan.

6.5 Ceduna Airport Master Plan Framework

While the Ceduna Development Plan provides the statutory planning policy framework for development on or surrounding the Ceduna Airport, the Ceduna Airport Master Plan Framework provides a more detailed framework to guide future development on airport land.

It is envisaged that the Framework will be incorporated into the Ceduna Development Plan through a future Development Plan Amendment process.

The Ceduna Airport Master Plan Framework builds upon the existing planning policies for the Airfield Zone, as contained within the Ceduna Development Plan.

The Ceduna Airport Master Plan Framework seeks to provide a more refined level of detail to the Airfield Zone, dividing the Zone into a number of Precincts (as shown in Figure 6.3):

- Runways Precinct
- Terminals Precinct
- Commercial Precinct
- Conservation Precinct

6.5.1 Runways Precinct

The Runways Precinct occupies the major portion of the airport and is essentially bounded by farmland to the east and south and the Terminals, Conservation and Commercial precincts, to the west and the Eyre Highway, and to the north.

The Precinct is an area of the airport set aside to be protected for the operation and movement of aircraft and associated activities. Development within the Precinct should focus on the aviation needs of the airport, with ancillary and related support facilities enhancing the airport's operation.

The primary objective of the Runways Precinct is to provide an area accommodating:

- safe aircraft landing, take off and taxiing operations; both for fixed wing and rotary services;
- aircraft navigation aids, radar and communications equipment;
- air traffic control, aviation rescue and firefighting and meteorological services; and
- aviation-related support industry.

6.5.2 Terminals Precinct

There are two areas set aside for development of terminals: the existing northwest terminals precinct and a new northeast area at the junction the cross runways.

The northwest Terminals Precinct has a frontage to the Eyre Highway and is bounded to the south and east by the Runways Precinct and to the north by the Commercial Precinct (Figure 6.3). A small area of non-airport land at the intersection of the Eyre Highway and Hastings Road abuts the north-western edge of the Terminals Precinct.

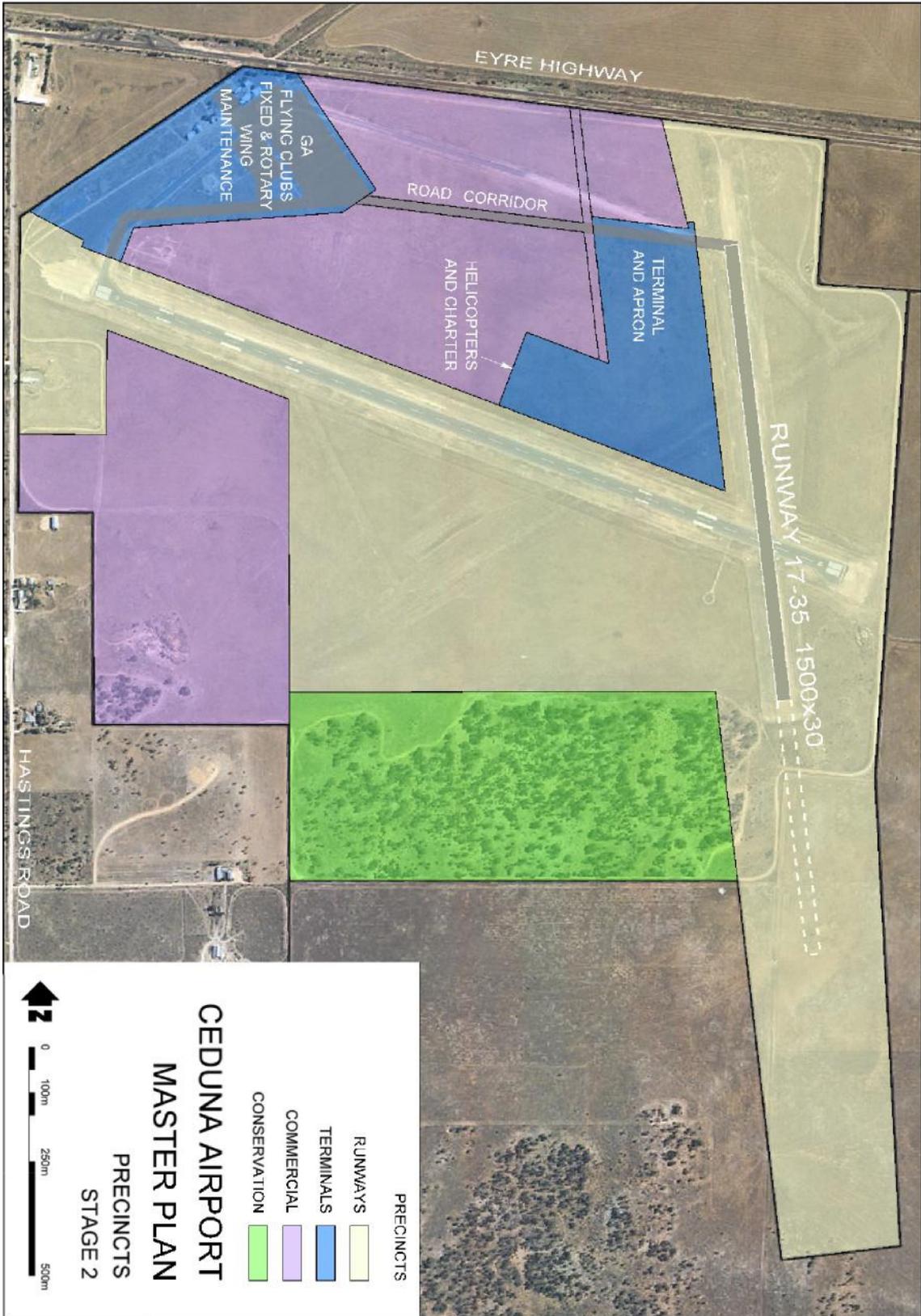


Figure 6.3 Ceduna Airfield Zone Stage 2 Precinct Plan

The Terminals Precinct encompasses the existing main terminal and aviation-support facilities and associated infrastructure. Land use is predominantly aviation-related with some commercial and industrial uses interspersed.

The northeast Terminals Precinct is located at the junction of the cross runways and is bordered by the Runways Precinct and the Commercial precinct (Figure 6.3). This precinct will provide for the development of new terminal facilities and terminal support facilities, general aviation facilities and some maintenance facilities.

The primary objective of the Terminals Precinct is to accommodate aviation-related activities, as well as complementary commercial and industrial services.

6.5.3 Commercial Precinct

There are two Commercial Precincts proposed as a part of this Draft Master Plan. The first is located in the northern side of the airport with frontage to the Eyre Highway, and has a prime location with exposure to significant traffic volumes. Access is to be gained directly from the highway.

This Precinct will accommodate a range of commercial, service, trade and large scale retailing facilities, with supporting shops and services.

The second Commercial Precinct is proposed for the western side of the airport with access from Hastings Road and bounded by the Runways Precinct to the North, the Conservation Precinct to the east and freehold land to the south.

This Precinct will accommodate a range of commercial, service and trade businesses, with supporting services.

The primary objective of the Commercial Precincts is to accommodate a range of commercial, service trade and retailing facilities, capitalising on the highway frontage to the Eyre Highway and for those which do not require a highway frontage, the southern Precinct with access from Hastings Road.

6.5.4 Conservation Precinct

The Conservation Precinct is located at the southern edge of the airport to the south of the Runways Precinct. The Precinct provides conservation and rehabilitation opportunities for remnant scrub communities. Compatible uses such as education and interpretive facilities and aeronautical equipment may be appropriate.

Vehicular access to the Precinct will be limited to that required in association with conservation/interpretive facilities.

The primary objective for the Conservation Precinct is for an area that provides protection for sites of conservation significance and development of compatible uses such as education and interpretive facilities.

7 AIRPORT DEVELOPMENT

7.1 Introduction

Ceduna Airport has experienced significant growth in Regular Transport Passengers, with an increase of 54.7% in passenger numbers during the period 2001 to 2011. Since 2007, passenger numbers have continued to rise with approx. 24,000 people per annum utilising air services.

Subsequently, the existing airport infrastructure is now struggling to cope with the regular passenger transport operator upgrading their aircraft from 18 seat Metroliners to 34 Seat SAAB 340 aircraft, taking the usage numbers from fifty-five passengers and greeting parties during maximum loadings, to over one hundred during maximum loadings.

The provision of efficient and productive infrastructure is a prerequisite for establishing ongoing economic growth and competitiveness. The economic services provided by infrastructure are fundamental inputs to production.

The re-development of the infrastructure at the Ceduna Airport is therefore essential to it becoming the key regional base for industries including mining, tourism, aquaculture and associated industries including building & construction.

The development will provide clear economic outcomes via increased business and industry activity, investment and employment in the region.

Within this section of the Master Plan, a discussion of the likely future developments on the airport is included. This commentary includes those developments not directly related to airport services, and is also provided for those non-aviation related developments in the Commercial Precincts.

Proposed developments are outlined in terms of the airport development and are assigned timeframes that are indicative only and will be dependent on the future growth in aviation at the airport.

The planned developments are outlined for the movement area (runways, taxiways and aprons), for the Terminal Areas and the Commercial Areas.

The land use planning is proposed in a two-stage process that involves the development of precincts, which can be modified as the developments proceed, and air traffic increases and should be given consideration in any interim development.

The two stages of the precinct developments are shown in Figures 7.1 and 7.2 respectively.

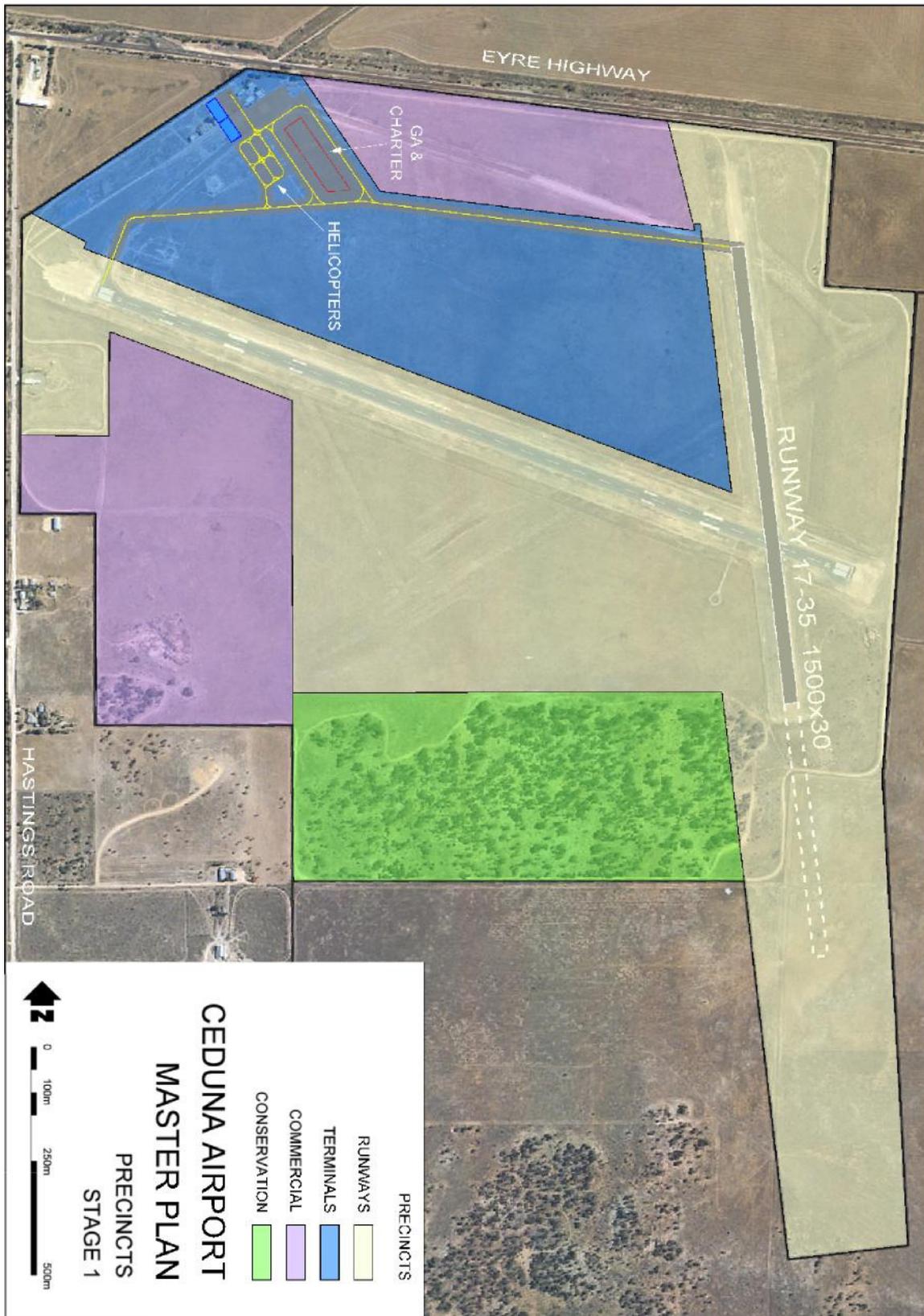


Figure 7.1 Stage 1 Precinct Plan

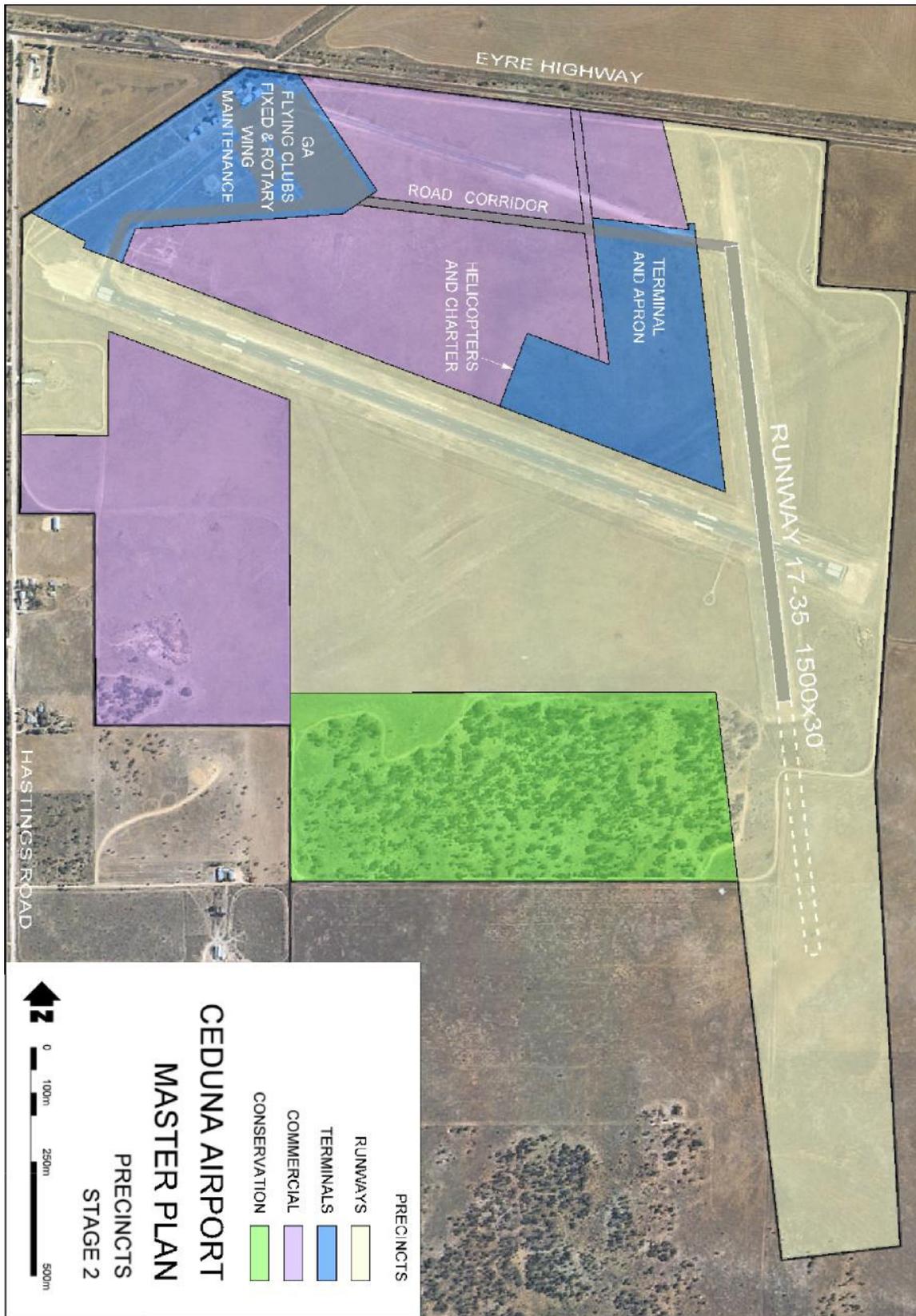


Figure 7.2 Stage 2 Precinct Plan

7.2 Movement Area Planning Criteria

7.2.1 Critical Aircraft

For master planning purposes it is essential to select the largest aircraft type likely to use the airport on a regular basis within the design horizon and plan facilities to meet the particular needs of that aircraft. Allowance for larger aircraft arriving on an occasional basis can be considered for master planning providing this does not result in layouts that are uneconomic or impose unnecessary restrictions on adjacent land use.

The Regional Express Airlines Saab 340 currently provides regular passenger services to Ceduna. Based on forecast growth, future passenger demands could be accommodated by an increased number of flights by aircraft similar to the Saab 340. Alternatively operators may opt for increased seating capacity; an example being the 50 seat Fokker 50 aircraft, introduced by Alliance Airlines to service Roxby Downs and the Oxiana Mine at Prominent Hill south of Coober Pedy.

A range of turbo prop aircraft that may operate RPT services into Ceduna within the next 20 years is provided in Table 7.1.

[Table 7.1 Possible Turbo Prop Aircraft Operating at Ceduna](#)

AIRCRAFT	MAX WEIGHT kg	PASSENGERS
ATR 42 500	18,600	44-50
ATR 72	22,970	62-74
Bombardier Dash 8 300	18,860	50-56
Bombardier Q400 (Dash 8 400)	29,257	68-78
Dash 8-200	16,425	37 - 39
Fokker F50 (production ceased 1996)	20,820	up to 58
Metroliner 23	7,484	18
Saab 340 (production ceased 1999)	13,200	30-36

As of 2006 only the ATR 42/72 (France) and the Dash 8 (Canada) remain in production leaving a limited number of options available to prospective airlines.

Therefore this Master Plan has adopted the Bombardier Q400 (Dash 8 400) as the critical design aircraft for the planning period of the Master Plan (20 years). The Q400 is classified Code 3C and can operate off 30 m runways. Beyond 20 years the industry predicts further development in this type of Code 3 aircraft. In comparison to jets, the turbo prop aircraft can operate off shorter and narrower runways and they have superior cost efficiencies especially over short-haul routes. It is likely these aircraft will develop further to gain larger seating capacity. Bombardier already has the improved Q400Next Gen in production and is considering a stretched version to accommodate 90 passengers.

Other than the requirement for the aerodrome operator to provide a visual aid for slope guidance and increased security measures by regulators, it is possible for regional jets to operate into Ceduna. The jet aircraft that may operate into Ceduna that are considered for planning purposes are shown in Table 7.2.

[Table 7.2 Possible Jet Aircraft Operating at Ceduna](#)

AIRCRAFT	MAX WEIGHT kg	PASSENGERS
BAE 146 300 (production ceased 2000)	44,225	87
Bombardier CRJ 200 (production ceased 2000)	23,134	50
Bombardier CRJ 700	34,160	64-75
Bombardier CRJ 900	38,329	90
Embraer ERJ 145	22,127	50
F100 (production ceased 1999)	41,730	107

Planning allowance has been made to accommodate aircraft size up to and including the regional turbo prop and jet aircraft listed to CRJ 700/900 and Embraer ERJ 145. Preliminary advice from CASA identifies these aircraft as Reference Code 3C which comprises aeroplanes with a reference field length up to 1,800 m and wingspans up to 36 m.

The Airport Reference Code is described by International Civil Aviation Organisation (ICAO) as a system that relates the characteristics of aerodromes to specifications that are suitable for the aeroplanes that are intended to operate from these aerodromes. The code number relates to the aeroplane reference field length, the code letter is based on the aeroplane wingspan and outer main gear wheel span. Note that determination of the aeroplane reference field length is solely for the selection of the code number and is not intended to influence the actual runway length provided.

The airport layout adopted in this Master Plan allows for Code 3C aeroplanes. Larger Code 4C aircraft including Airbus A320, Boeing 737, considered too large to provide economic services into Ceduna, can still be considered for ad-hoc operations without alteration to the overall layout.

7.2.2 Runway Usability

The controllability of aeroplanes during landing and take-off is largely affected by the component of the wind velocity at right angles to the runway centre line (the cross-wind component) and the component in line with the runway centre line (that is, the headwind or tail-wind component). Different types of aeroplanes have different wind component limits, beyond which pilots are not permitted to land or take-off.

Runway useability is the proportion of the time the winds at an aerodrome allow it to be used by aeroplanes with specified limiting crosswind capability. It is expressed as a percentage, and is related to a particular value of limiting crosswind.

There is no regulation requiring an airport to have a specific wind useability, although pilots must observe the allowable cross wind component for their particular aircraft. The International Civil Aviation Organization (ICAO) Annex 14 states the number and orientation of runways at an aerodrome should be such that the usability is not less than 95% for the aeroplanes that the aerodrome is intended to serve (ICAO Annex 14 Volume I Aerodrome Design and Operations 1999).

The allowable crosswind component varies with aircraft type. ICAO Annex 14 assumes for planning purposes, that landing or take-off by aeroplanes is precluded when the crosswind component exceeds:

- 37 km/h (20 kt) for aeroplanes whose reference field length¹ is 1500 m or over,
- 24 km/h (13 kt) for aeroplanes whose reference field length is 1200 m or up to 1500 m; and,
- 19 km/h (10 kt) for aeroplanes whose reference field length is less than 1200 m.

Prior to transfer of Ceduna Airport to Council from the Commonwealth, the aerodrome consisted of 3 unsealed runways comprising the 11/29 main runway aligned northwest/southeast, a short cross runway 17/35 aligned north/south and a southwest/northeast runway 06/24. Part of the pre transfer works included reducing the number of runways to two and upgrading and sealing one of the remaining runways. The decision on which pair of runways to be retained was presumably influenced largely by:

- runway 11/29 being located nearest to the existing terminal/apron area, resulting in reduced taxiway length, hence reduced operating and maintenance costs;
- the available length of the 11/29 runway being far longer than either of the cross runways available at the time: and,
- the wind useability for the combination of runway 17/35 and 06/24 being calculated by the Commonwealth to be acceptable.

Closure of the 06/24 runway was undertaken as part of a range of works offered by the Commonwealth to assist the District Council of Ceduna take over running the airport under the Aerodrome Local Ownership Plan.

The decision to retain runways 11/29 and 17/35 has caused some problems to aircraft as the main runway 11/29 can often be out of wind particularly during hot weather, while the 17/35 runway is too short for Regular Public Transport and other aircraft requiring longer lengths and/or a sealed pavement surface.

A study of prevailing wind directions based on Bureau of Meteorology data determined the crosswind useability of runway 11/29 to be as low as 72.9% for the 3 pm periods for aircraft with a maximum cross wind capability of 24 kph. In comparison the 17/35 runway useability dips as low as 89.9% for the 3 pm period. Clearly if the 17/35 runway could be lengthened and employed as the main runway, with the 11/29 available as a secondary facility, there would be a significant increase in the overall wind useability of the airport. Combining both runways brings the minimum useability up to 95.8%.

7.2.3 Runway Length

Development of Runway 17/35

From the wind study, it is very desirable to extend and upgrade the existing 17/35 runway into the main runway facility for the airport. Initial planning allows for construction of a 1,500 m long sealed runway, with provision for an ultimate length of 2,000 m if ever required in the future (see Figure 7.3).

To achieve the required length the northern strip end has been located approximately 250 m clear of the Eyre Highway.

The specified take off gradient for a Code 3 runway is 2%. The maximum permitted truck height on South Australian roads is 4.3 m. For planning purposes, it is appropriate that consideration be given to cater for the worst-case scenario, which involves a truck of maximum height using the Eyre Highway while Code 3 aircraft are taking off.

Land acquisition has been completed to allow for construction of an extension to the runway. Planning provision (Refer Protection of Airspace below) will allow for an ultimate runway length of 2,000 m through the protection of airspace from new developments and structures.

A diagram showing the position of the extended 17/35 runway is presented in Figure 7.3.

7.2.4 Runway Strip Width

The runway strip is the cleared and graded area each side of the runway, designed to accommodate aircraft inadvertently running off the runway without causing structural damage to the aircraft. The selected runway strip width determines among other things the minimum separation of taxiways and aprons.

For Code 3C aircraft, a runway strip of 150 m is required for non-precision instrument aircraft operations operating from 30 m wide runways. Non-precision instrument Global Positioning System (GPS) approaches are likely to be used at Ceduna during Instrument Meteorological Conditions (IMC). Precision approach runways such as the Instrument Landing System (ILS) are generally installed only at capital city airports and others that cater for regular use by large passenger jet aircraft.

For master planning purposes, a 150 m runway strip width is recommended for long term planning, as this width can be accommodated without undue restriction to on airport development.

7.2.5 Taxiway and Apron System

The drawing Stage 1 Precinct Plan (Figure 7.1) depicts a sealed 17/35 runway linked to a regional commuter RPT apron area by a single connecting taxiway.

Figure 7.4 shows an expanded RPT commuter apron and a new charter & general aviation apron facility with a taxiway connection to existing runway 11/29. This layout assumes initial general aviation development would take place in the existing developed areas.

The Stage 2 Precinct Plan (Figure 7.2) provides for a movement and development of the terminal facilities at the intersection of the two runways. The layout also includes expanded commuter airline apron and new general aviation aprons. The layout shown is likely to be beyond what can be reasonably predicted in the scope of the 20-year planning horizon for the Master Plan.

Apron set backs have been calculated to ensure aircraft parking positions allow for side transitional clearance from the edge of a 150 m runway strip for aircraft up to 13 m in height which includes all the regional turbo prop and jet aircraft mentioned earlier. It also allows for A320 (tail height 11.7 m) and B737 (tail height 12.5 m) should aircraft of this size ever visit Ceduna.

The building line at the edge of the apron has been set a minimum of 210 m back from the edge of a 150 m wide runway strip to allow for side transitional clearance over 30 m floodlight towers that are assumed to be necessary for future apron lighting.



Figure 7.3 Location of the Proposed Extended 17/35 Main Runway



Figure 7.4 Expanded Commuter Apron and Maintenance Facilities

7.2.6 Aircraft Refuelling

Refuelling of commuter aircraft currently makes use of a single bowser and hose reel arrangement. The disadvantage of this system is the reduced flexibility for parking which requires aircraft refuelling points to be with approximately 30 m of the bowser position due to limitations on the length of hose reels.

Plans are presently being developed to accommodate a new Jet A1 tank adjacent to the Avgas facility and provide a second bowser and hose reel at a second refuelling point. This will allow removal of the existing storage facility amongst the buildings and free-up much needed land for future terminal area development. The design will include the extension of system to provide an additional fuel supply point to a helicopter base.

For planning purposes it is recommended consideration to mobile tanker refuelling be adopted for initial fuel supply as part of the Stage 2 Precinct Plan. This allows, if needed, retained use of the existing storage facility and allows complete flexibility on future aircraft parking position arrangements.

A new fuel storage facility supporting tanker refuelling may eventually be needed, although tanker operations may continue from the old storage facility for some time as appropriate.

The new site permits ease of access to aircraft by refuelling vehicles. It also permits airside road access by bridging tankers without having to pass the terminal frontage.

7.3 Terminal Area Planning

7.3.1 Terminal Area Development

As aircraft movements increase, the existing terminal building is now at capacity and will exceed capacity if two or more aircraft require processing at the same time. Before this occurs, it is proposed to plan for an upgraded and larger terminal building to be built as an extension of the existing building and the necessary apron changes made in front of this building to accommodate the new location and taxiway access.

Given the projected rates of increase of aircraft movements described in Chapter 4 of this Master Plan, the need for an increase in the capacity of the Terminal building may occur in the next five years, depending on the economic development rate of the Ceduna area.

Accompanying the re-development of the terminal building, a redevelopment to the existing immediate terminal area, including car parking (long and short term), bus parking, fuel farms, communications facilities, security and services infrastructure, may need to be undertaken.

It is proposed that a detailed terminal area plan be developed for Ceduna Airport as a matter of priority.

Proposals for the development of new terminals and associated infrastructure in the central area of the airport have been proposed previously. The need for this development in the near future (the term of this Master Plan) is unlikely given the rate of increase of movements and the initial capital cost of relocating infrastructure to the central area, away from the existing terminal area.

New terminal facilities have been included in the central area supporting development of the extended 17/35 runway. Design and construction plans have been prepared by GHD Pty Ltd for a new single level, linear building development (GHD April 2007).

7.3.2 Road Access

A new road connection from the Eyre Highway is depicted to provide access to a service road to support commercial development along the Eyre Highway. This access would be extended to the proposed new terminal and additional commercial development depicted on the Stage 2 Precinct Plan (Figure 7.2). The terminal access road can develop to provide a loop road arrangement around new car parking facilities. Access can be expanded as needed to gain entry to future hangar, fuel storage and commercial sites

Facilities that are retained in the existing northwest area should keep the existing road link to the Eyre Highway.

7.3.3 Aircraft Maintenance

A number of small sheds for the storage of aircraft are located west of the present passenger terminal and old Flight Service Building. These facilities may be able to remain in the present location indefinitely. Should new hangars be required, these could be constructed either in the new central area, or retained in proximity to the existing aircraft storage areas. Large commercial facilities, if required, are better placed in the new site, small sheds for individual aircraft storage should remain clear of the new facilities.

7.3.4 Helicopter Facilities

Helicopter parking facilities are located south west of the existing commuter apron. Where there is no requirement to link passengers directly from airline services on to helicopters, use of the existing area can remain. Conversely where crews are flown on commuter aircraft to Ceduna, then transferred by helicopter to work sites, a dedicated parking area in walking distance from the terminal would be desirable. Possible helicopter parking areas are depicted on the Stage 1 and Stage 2 Precinct Plans. Use of a dedicated parking area for helicopters clear of fixed wing aircraft and other users is desirable to avoid rotor wash and clearance problems to adjacent fixed wing aircraft.

Repairs and maintenance servicing when required can be conducted from fixed wing maintenance hangars. Where access into a hangar is required, use of trolleys is necessary. Provision for the ability for helicopters to ground taxi or air taxi requires considerable space, and is normally not considered other than at dedicated heliports or on sections of large airports devoted entirely to helicopters.

Parking and maintenance of helicopters as depicted in Figures 7.1 and 7.2 facilitates connection of helicopter passenger with fixed wing flights through the terminal. As either the general aviation or RPT aprons expand the helicopter parking areas are relocated to remain clear of fixed wing activity. Adequate separation is required to avoid problems associated with rotor down wash and to maintain the required air taxi

corridor separation as defined by CASA which is normally one and a half times the maximum dimension of the helicopter with the rotor turning from centreline to object.

7.3.5 Freight

The most likely requirement for future freight facilities comes from the shipping of aquaculture and fishing products to larger centres for on forwarding to domestic and international markets. Where storage is required on site, freezer storage facilities with direct access to airside would be needed. A possible area for freight facilities feeding to the freight aircraft off the commuter apron area is to the north of the future terminal and RPT apron area

7.4 Commercial Precinct

Development of a commercial precinct directly adjacent to the Eyre Highway frontage is proposed. Sites with direct exposure to the Eyre Highway may prove commercially attractive. Possible use includes service station/truck stop, bulky goods display showroom warehouse, mining operations (offices, staging areas, storage areas), transport company depot (TNT, Brambles, Security Express), road freight companies (Ceduna–Adelaide and Ceduna–Perth) and car wash.

The later conversion of the Bravo taxiway to a road once the new terminal is established will facilitate the opening up of a larger commercial precinct adjacent to the runways precinct, which will provide for commercial sites that do not necessarily require highway frontage.

Commercial sites that are related to aviation facilities on the airport, for example airline and charter offices, aquaculture and fishery processing facilities for export, repair workshops, catering, freight agencies, car hire facilities etc., can be allocated in close proximity to the airside/landside boundary.

8 AIRPORT INFRASTRUCTURE PLAN

8.1 Planned Infrastructure Works

The proposed development plan outlined above will require a number of development actions to progress. These actions have been prioritised and are presented according to need.

Priority 1 – Provide additional Jet A1 storage and second bowser

The substantial increase in general aviation, charter and helicopter operations due to established mining and continuing exploration in the region is expected to result in an increase in sales of Jet A1 through the airport this financial year by some 43%.

This substantial increase has necessitated an increase in Jet A1 storage to enable an uninterrupted supply to be available.

Additionally increases in RFDS use of the airport have placed additional pressure to ensure sufficient supply for this crucial service.

Priority 2 – Realign Bravo & Alpha taxiway and provide new aircraft and helicopter parking areas

The existing unsealed GA and helicopter parking area is proving to be too small for the increasing numbers of GA and Charter aircraft transiting the airport.

No provision of aircraft tie downs is resulting in ad hoc measures being taken by aircraft owners to secure their aircraft.

Moving taxiway bravo will provide better access to the apron area and more room to improve apron layout. This will also open up a rectangular piece of land fronting the Eyre Highway for commercial development. Future development of a new terminal precinct will allow the realigned taxiway bravo to become an internal road within an extended commercial development area.

Priority 2 – Upgrade apron and parking area lighting

Existing apron lighting infrastructure has been identified in annual lighting inspections to be below standard. Whilst immediate action is not required, any changes to the apron and parking area will require upgrade to the lighting to meet new MOS 139 standards.

Priority 2 – Seal aircraft parking areas

Increased requests for parking on a sealed surface are being received from survey planes, customs watch aircraft and the RPT provider. Regional Express Airlines are requiring parking for a SAAB 340 on the sealed apron one day a week. This dramatically reduces the remaining available parking on the sealed apron. All jet and turboprop aircraft are very reluctant to park on unsealed pavements and wash from helicopter operations over unsealed surfaces affects all airport users.

Priority 3 – Install aircraft visual guidance system

Due to the low laying nature of the airport adverse weather conditions occasionally prevent the on-time arrival of the RPT aircraft, with fog reducing visibility significantly.

Ceduna's remote location places a heavy reliance on the RFDS in the event of a medical emergency; installation of aircraft guidance systems would greatly improve safety, usability and access to the airport for RFDS.

Priority 4 – Construct Long Term Car Parking

The sealed car park immediately adjacent to the terminal has been made 2-hour time limited parking to alleviate the parking pressure during RPT arrival and departures. This has necessitated the development of a temporary long-term car park adjacent to the exit of the airport to accommodate the mining employee's vehicles.

Mining charter aircraft using Ceduna two days a week during shift change at the Jacinth Ambrosia mine has meant an increase in employee's vehicles being left at the airport for extended periods of time. On a regular basis as many as 20 - 30 vehicles are currently left in the long term parking area for periods of up to two weeks.

This temporary situation is unsuitable as it creates a bottleneck for emergency vehicles accessing the ESRP gate in the event of an emergency, is unsealed, and there is minimal lighting and no constructed footpaths from the area to the terminal.

8.2 Airport Infrastructure to meet Operational Change

This master plan foreshadows a number of likely changes at Ceduna Airport that will require infrastructure changes and additions.

8.2.1 Larger Aircraft

Infrastructure Required – New or increased terminal capacity & new or increased apron capacity.

As indicated in the introduction the use of increased size aircraft to provide RPT services is presently placing undue pressure on the terminal building. Introduction of an aircraft larger than the currently used SAAB 340 would require a larger terminal to cater for passengers and meeters/greeters.

The apron is presently only large enough to accommodate two SAAB 340 aircraft.

8.2.2 Aircraft Schedule Conflict

Infrastructure Required – New or increased terminal capacity and new or increased apron capacity.

Introduction of a second airline or conflicts with charter services resulting in two aircraft on the apron at the same time would make the terminal untenable. The size of the terminal at present is uncomfortable to say the least and with a 70% occupancy of one 34-seater aircraft resulting in around 80 people at peak times, comprising of arriving passengers, departing passengers and meters and greeters at the terminal.

A dramatic increase in passenger numbers, occurring from two aircraft loading or disembarking passengers at the same time, could not be catered for with the current terminal.

8.2.3 Introduction of Security Screening

Infrastructure Required – Develop new terminal, apron access road and associated infrastructure

Again the size of the existing terminal will not accommodate the infrastructure require for full baggage and passenger screening.

In reality a requirement to go to hand wandering would result in passengers being inconvenienced and potentially having to wait on the airside as the terminal is too small to accommodate both wanded and non-wanded passengers comfortably.

Constraints around the terminal building from existing infrastructure including Jet A1 fuel compound, buildings and car parking make it difficult and costly to extend the existing terminal building to accommodate the screening equipment.

8.2.4 Smaller aircraft – RPT or Charter

Infrastructure Required – Rebuild, lengthen and seal 17/35 runway

When Runway 11/29 is out of wind smaller aircraft are required to use the currently unsealed Runway 17/35. Whilst this is something general aviation plans around, if RPT or Charter services were to commit to regular services with smaller aircraft then the inability to use the sealed 11/29 runway, especially during summer months when strong sea breezes regularly exceed the crosswind capacity of smaller aircraft types would have a significant impact on their operations.

8.2.5 Jet Services (Code 4)

Infrastructure Required – Develop new terminal, apron access road and associated infrastructure plus rebuild, lengthen and seal 17/35 runway

Introduction of jet services would require a much larger terminal facility, larger apron and car parking areas as well as the requirement for full passenger and baggage screening (see above). This infrastructure would not fit on the present terminal site and the development of a new green fields facility would be required.

The strength of runway 11/29 is insufficient to cater for the ACN of passenger jet aircraft and noise modelling has determined that these services should be directed away from approach and departure paths over the town centre. Development and sealing of the 17/35 runway would be required to cater for these aircraft.

8.2.6 Increased RPT and Charter Activity

Infrastructure Required – Extend apron and parking areas

With only two parking positions available on the sealed apron, one for a SAAB 340 size aircraft and one for a F27 size aircraft regular conflict is already occurring with aircraft manoeuvring to refuelling and parking positions.

The present unsealed GA parking area is only suitable for the numbers of aircraft currently transiting the airport, any increase in Charter, GA or RPT aircraft wishing to park would necessitate an increase to the airside parking.

The size of the apron is barely suitable for the existing aircraft, should charter activity or size of aircraft used for charter or other passenger aircraft increase conflict would occur on the apron.

8.2.7 Helicopter Charter Established

Infrastructure Required – Develop separate apron & extend Jet A1 service plus provide bowser

A dedicated helicopter apron would assist to establish the required separation distance from helicopter and RPT apron.

The close proximity of the Jet A1 bowser to the airport terminal is particularly unsatisfactory for helicopter use once rotor wash is factored in.

There is currently scope to extend the Jet A1 infrastructure so that congestion on the apron during refuelling is alleviated. With the RPT provider increasingly requiring fuel in Ceduna the potential for conflict on the apron at times is increasing.

8.2.8 Industrial Land Demand (leased)

Infrastructure Required – Develop land adjacent to Eyre Highway into allotments with new access to Eyre Highway and provide roads, electrical, water, sewer and communications to all allotments.

Development of the airport to include non-aviation related industries would provide some economic stability for the future of the airport. Diversification of interests may assist to buffer the airport from aviation based downturn should this occur in the future.

Services provided to the industrial development could then be extended to the new terminal precinct as the airport continues to develop.

8.3 Implementation Plan

The following list (Table 8.1) provides a guide to the major land use planning and on-airport development to take place within the 20-year planning horizon.

Table 8.1 Implementation Plan

<u>Development</u>	<u>Drivers</u>	<u>Possible Time Frame</u>
Stage 1 Precinct Plan		
Delineation of on airport precincts	Allowance for future commercial development along the Eyre Highway	2013
Update of Ceduna Development Plan to reflect Stage 1 precincts	Protection of zoning for future airport development	2013
Approvals for new access off Eyre Highway	Demand for commercial land	2014
Stage 2 Precinct Plan		
Further delineation of precinct areas	Additional demands of commercial premises on airport New terminal development	2027
Update of Ceduna Development Plan to reflect Stage 2 precincts	Protection of zoning for future airport development	2028
Infrastructure Plan		
Additional Jet A1 storage & 2 nd bowser	Increase in general aviation, charter & helicopter operations	2013
Realignment of Bravo taxiway and extend existing general aviation parking areas	Increase in RPT, charter and/or general aviation Allowance for future commercial development along the Eyre Highway	2013
Realign Alpha taxiway	Charter & helicopter bases	2014
Upgrade apron & parking area lighting	Changes to apron layout will necessitate upgrade of lighting	2014
Seal aircraft parking areas	Increasing requests for sealed parking from survey aircraft, RPT, customs, jet & helicopter operators	2014
Installation of aircraft visual guidance systems	Increasing adverse weather conditions effecting airport usage by RFDS & commercial operators	2016
Construction of long term car parking	Increase in vehicles left at airport for extended periods of time	2016

Table 8.2 Infrastructure Triggers for Development

Future Infrastructure Triggers for Development	Trigger
Re-development of existing terminal	Existing terminal unable to meet growing demands Introduction of security screening due to change in aircraft types (jet) or sizes Aircraft schedule conflict
Re-development of existing RPT apron and taxiway development	Introduction of larger aircraft Part of infrastructure required for re-development of existing passenger terminal Aircraft schedule conflict Increase in aircraft movements, RPT, Charter activity
Rebuild, lengthen and seal Rwy 17/35	Introduction of smaller RPT or Charter aircraft Introduction of Jet services (Code 4) Operational requirement for greater all year usability
Develop separate helicopter apron & extend Jet A1 services	Permanent charter base for helicopters Require separation distance from fixed wing operations
Develop land adjacent to Eyre Highway	Demand for non-aviation related industrial land
Develop internal commercial land	Increase demand for aviation related business based on airport
New terminal	Existing terminal unable to cope with space requirements of increased commuter activity Aircraft schedule conflict Introduction of security screening Existing terminal fails to meet community expectation with respect to: <ul style="list-style-type: none"> • Space allocation • Comfort level • Compliance with regulation
New RPT apron and taxiway development	Part of infrastructure required for new passenger terminal development
Road access and new car park	Part of infrastructure required for new passenger terminal development
New aviation fuel storage facility	Mobile tankers needed to service new passenger terminal Existing facility exceeds expected lifespan Lack of available storage capacity to meet future demand Operation from current site becomes uneconomical with new terminal development
Commercial development	Market demand
New powerhouse	Existing airport lighting generator set becomes obsolete (difficulty in sourcing spare parts etc.) and/or unable to cope with additional lighting and power demand
Freight apron/maintenance apron & equipment storage facility	Commencement of dedicated freighter services Market demand
Parallel taxiway for Rwy 17/35	Increased usability of runway and maximize efficiency of operations
Hangar development	Market demand

9 ENVIRONMENTAL MANAGEMENT

9.1 Introduction

The future development of the airport, as described in this Master Plan has the potential to impact on the environment, both on-airport and in the adjacent and surrounding areas. This section describes the environment on the airport and the historical and current impacts of airport operations on that environment. It also provides an assessment of the potential environmental impacts of the developments outlined in the preceding sections and outlines proposed measures to prevent, control or reduce the impacts arising from those expected issues.

Aspects such as flora and fauna, soil and groundwater quality, air and noise emissions, hazardous substance storage, waste and resource consumption contribute to the environmental performance of a company. As a manager of a large area of land, the airport operator has a legal and moral requirement to effectively manage broad environmental issues.

9.1.1 Legislation

Based on a site assessment undertaken by Adelaide Airport Limited Environment staff (January 2010) and consultation with Council staff representatives, there are no known compliance issues associated with the following Commonwealth and State environmental legislation of relevance to site activities:

- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth);
- *National Greenhouse and Energy Reporting Regulations 2008* (Commonwealth);
- *Environmental Protection Act 1993* and relevant policies:
 - *Environment Protection (Noise) Policy 2007*;
 - *Environment Protection (Water Quality) Policy 2003*;
 - *Environment Protection (Air Quality) Policy 1994*;
- *Aboriginal Heritage Act 1988*;
- *Development Act 1993*;
- *Waterworks Act 1932*;
- *Dangerous Substances Act 1979*;
- *Petroleum Products Regulation Act 1995*;
- *Heritage Places Act 1993*; and
- *Natural Resources Management Act 2004*.

9.2 Description of the Environment

9.2.1 Location and Land Use

Ceduna Airport is located approximately 2.5 km to the east of central Ceduna. The airport is situated on a relatively flat parcel of land with no major topographic features.

The airport land is zoned as 'Airfield Zone' under the Ceduna Council Development Plan (consolidated October 2008). A Deed of Transfer was executed in 1990 whereby the site was transferred from the Federal Government to the District Council of Ceduna.

The site has been used as an airport since 1929. A variety of land divisions and acquisitions by the Commonwealth of Australia occurred between 1929 and 1967, whereby the current airport boundaries were established in 1967 (URS 2003).

The airport's role includes scheduled air services and provision of daily passenger service to Adelaide, charter operations, flights for tuna spotting, access for the Royal Flying Doctor Service, and/or agricultural operations or the like.

The airport is predominantly surrounded by agricultural land with rural living located adjacent to the south-eastern corner of the airport. The southern section of the airport contains remnant vegetation and low-lying scrub. To the east of the airport the land use is commercial. The Eyre Highway borders the northern boundary of the airport and on the other side of the highway is agricultural land use as well.

9.2.2 Flora

The land surrounding the airport is primarily used for agricultural purposes, including grazing of livestock and cropping, and some land parcels are zoned rural residential.

Native vegetation extant on the airport site itself is dominated by *Austrostipa* grasslands, interspersed with *Austrostipa/Austrodanthonia* grasslands, interspersed with clumps of chenopods such as *Maireana* species and *Sclerolaena* species.

There are two areas of remnant scrub, one large and one small. It is assumed that these are remnant due to the relatively intact nature of the microphytic crust. In the remnant scrub areas, it appeared to be a Mallee /Teatree low open woodland with a sparse understory including *Atriplex*, *Carpobrotus* and *Myoporum* species, which is consistent with vegetation associations in the area prior to clearing for agricultural purposes. Some of the individual mallee trees may meet significant tree criteria due to the number and thickness of stems (see Figure 9.1).

There are also some trees in the car park at the terminal entrance, which may be of significant size.

9.2.3 Fauna

Regular bird counts have been implemented (District Council of Ceduna, 2008), with follow up analysis and an annual bird hazard report being produced to direct management activities. The tally thus far indicates that the three most common species on site are: Australian Ravens, Plovers and Galahs. Kites and Starlings are also recorded in minimal numbers. There was no way to confirm species identification during the time of the survey.

Some land use adjacent to the airport is cropping which is an attractant to granivorous birds, including Galahs. There are a number of fishing industry facilities planned along the foreshore in the vicinity of the airport that have the potential to attract birds, as well as the foreshore itself. Although 4 – 5 km away from the runways, a number of Silver Gulls and Pacific Gulls were seen in these areas.

Security fencing is located only around the entrance carpark, and is a degraded livestock fence for the remainder of the perimeter fence.

There was a resident fox on the airport that had not been baited in order to assist with keeping plover numbers down and deterring them from nesting on the airfield.



Figure 9.1 Remnant Scrub on Ceduna Airport

Birds are the major wildlife management issue. Anecdotally, primarily galahs and plovers are most commonly involved in strikes. The Council has prepared a Bird and Animal Hazard Management Plan (BAHMP) based on the Australian Airports Association National Template, which covers deterrent strategies as well as harassment and culling techniques.

Strike reports are sent to Australian Transport Safety Bureau (ATSB); these data are recorded by the airport and analysed to direct management activities. Records are kept of bird 'dispatching' (culling) in the daily activity log.

9.2.4 Surface Water

The airport site is generally flat and stormwater drainage largely consists of open surface drains and swales. Overland floodwaters flow across the airport towards the northeast and the Eyre Highway.

The airport buildings drain into the car park where the surface water soaks into the ground therefore watering the trees. A number of grates are in place where the stormwater goes under the roadway. There is no pre-treatment of stormwater from hard-surface areas. A stormwater drain also exits at the eastern end of runway 11/29 onto open grassland and flow is directed towards Hastings Road.

The District Council of Ceduna does not conduct stormwater monitoring of which there is no regulatory requirement. Ceduna receives an annual average rainfall of 300 mm per year (BOM 2010).

9.2.5 Soil and Groundwater

The dominant geological formation at the airport comprises shallow marine fossiliferous sandy limestone of the Pleistocene age. Underlying the marine sediments are Paleoproterozoic orogenic granitoids of the Lincoln complex (Department of Mines and Energy 1995 as cited by URS 2003).

Regional groundwater flow is likely to be in a westerly direction towards Murat Bay. The Groundwater Resource Map of South Australia indicates that the shallow marine sediments contain several aquifers of low to moderate productivity and the groundwater in the area has a total dissolved salt (TDS) concentration greater than 5,000 mg/L (URS 2003).

Groundwater quality in the area is highly saline. The Groundwater Resource Map of South Australia indicates the groundwater underlying the area to have a total dissolved salt (TDS) ranging between 11,000 mg/L and 54,000 mg/L. The standing depth to groundwater is generally between 7-12 m below ground level as recorded in registered wells within a 5 km radius of the site (URS 2003).

9.2.6 Hazardous Substances/Dangerous Goods

The main hazardous substances storages are located within the two fuel farm facilities. The Jet A1 facility located to the north west of the terminal comprises of two underground storage tanks (UST) – holding Jet A1 – an associated decommissioned fuel hydrant (Jet A1) and a fuel bowser located on the apron. Ownership of the current fuel farm was transferred from Exxon Mobil to the Council in 2003.

An additional fuel farm facility is also located on the northern section of the apron and is owned by AirBP and managed under contract by the District Council of Ceduna. The site consists of an underground storage tank (UST) – holding Avgas – and an associated bowser on the apron.

Aviation Refuelling and Maintenance Pty Ltd are contracted to conduct tank inspections, maintenance and cleaning. These occur annually with an internal clean conducted in 2009. There is a basic spill kit adjacent to the Jet A1 fuel farm, the base is unpaved and suspected to be unlined.

During 2003 Exxon Mobil decommissioned the underground fuel pipework to the apron refuelling point. The infrastructure remains in situ. Council then installed a Jet A1 bowser on the apron for refuelling purposes, which is fed via underground pipework from the fuel farm.

Integrity tests have been conducted once on these tanks since Council took over ownership in 2003. The last known integrity test of the current Jet A1 UST and fuel lines was undertaken in 2009.

The diesel above ground storage tank (AST) observed at the powerhouse is of steel construction. Secondary containment, to the standard required by the EPA Guidelines for Bunding and Spill Management (EPA, 2007), was not in place at the powerhouse, although the two 200 L steel drums were located on a bunded container.

No herbicides or chemicals were stored on site. Maintenance of the airfield is carried out by a contractor who stores his or her own chemicals off site (Grant Drummond, pers. comm.). A metal locker for storage of minor hazardous substances (paints and oils) was located inside the Powerhouse building.

Council did not produce a register of spills. However spill materials were disposed of at the local waste facility that has a separate area for hazardous waste disposal. No spills in the last ten years had entered the stormwater system.

Proposed development will need to consider separation distances from the flammable goods storage compound (adjacent to the terminal) in accordance with the Dangerous Substances Act 1979.

The hazardous substances stored at Ceduna Airport are described in Table 9.1 below.

Table 9.1 Hazardous Substances Storages

No	Storage Type *	Hazardous Substances	Location	Capacity (L)
1	Hydrant	Jet A1	Council Fuel farm to apron bowser	Unknown
2	Hydrant (decommissioned)	Unknown (Jet A1/Avgas)	Apron	Unknown
3	UST	Jet A1	Council Fuel farm	12,800
4	UST	Jet A1	Council Fuel farm	12,800
5	UST (decommissioned)	Avgas	AirBP Fuel farm	Unknown
6	UST	Avgas	AirBP Fuel farm	50,000
7	AST	Diesel	Powerhouse	~500
8	AST	Diesel	Powerhouse	200 (x2)
9	AST (genset)	Diesel	Powerhouse	Unknown
10	AST (genset)	Diesel	Bureau of Meteorology site	Unknown

The Council has maintained an asbestos register for the three airport buildings that contain asbestos. An asbestos removal program for the terminal building was completed in 1999 as part of the terminal upgrade. Asbestos inspections are carried out annually by Council's Development Section.

Contamination Risks Associated with Current Activities

A number of facilities at Ceduna Airport pose a high risk of soil and groundwater contamination, namely the fuel farms, septic systems and transformers.

Mobil commissioned a Phase 1 Environmental Site Assessment (ESA) prior to the transfer of ownership of the Jet A1 fuel farm to the District Council of Ceduna. Council was able to produce a copy of the report that included a site history review as well as the tank integrity results. The report did not identify any historical losses of Jet A1 and as the tanks passed integrity tests they were suitable for ongoing use (URS 2003).

AirBP commissioned an ESA during the removal of an older underground storage tank during 2007 which was replaced with a 50,000 L dual lined tank. A portion of the excavated material was land farmed. The bowser was located on the perimeter of the apron and refuelling is undertaken on an unpaved area. No spill kit was located at the AirBP compound and a section of the compound was concrete lined, namely around the UST locations.

Council has requested that AirBP provide a copy of the reports from annual independent audits undertaken at the site as part of lease requirements. These reports are held onsite at the Avgas compound.

Council did not produce records from or know of any other past ESAs or soil and groundwater monitoring being conducted at the airport.

Table 9.2 Sites of Potential Contamination

No	Location	Contaminant	Status	Contamination Risk
1	Apron	Jet A1	Unknown	Very High
2	Fuel farm	Jet A1 / Avgas	Unknown	Very High
3	Powerhouse	Diesel	Unknown	Moderate
4	Septic (new)	Biological	Unknown	Low
5	Transformers	PCB Oil	Unknown	High
6	Runway strips	Herbicide	Unknown	Low

9.2.7 Air Quality

There are no observed significant point sources of air pollution on airport or in the immediate vicinity. No EPA air monitoring stations are installed near the airport with the closest station being located at Whyalla some 370 km away. Therefore no data on air quality is currently available.

Potential sources of air pollution in the vicinity include aircraft idling, motor vehicle exhaust, dust generation from vehicle movements, fuel storage and maintenance activities.

9.2.8 Airport Noise

There are no observed ground-based sources of high noise, and local residents are currently well buffered from the terminal area and other airport infrastructure.

There have been no documented noise complaints received by the Council relating to aircraft or ground-based noise.

9.2.9 Archaeology and Heritage

The District Council of Ceduna is in the final stages of signing off an Indigenous Land Use Agreement (ILUA) with the local Far West Native Title Claimant Group covering the entire Council area. The ILUA is a mechanism where negotiation with traditional owners is undertaken to identify aboriginal interest in land and form an agreement as to what development activities can occur on the land in question and consequently what compensation the traditional owners are to receive for allowing development of the land (Grant Drummond, email dated 21 January 2010). Once finalised, ILUAs are registered with the National Native Title Tribunal and the agreement is made under the *Native Title Act 1998*. The document is binding to all parties involved (Commonwealth of Australia 2009).

There are no recorded or State/local listed sites of built or archaeological heritage significance at Ceduna Airport. This was confirmed through a search of the Ceduna Airport site against the Australian Heritage Places Inventory (AHPI). The AHPI includes only limited information on State Heritage Places extracted from the South Australian Heritage Database and the data is updated fortnightly. The subject site, or any part of the Subject Site, is not a State Heritage Place.

There are no State Heritage places adjacent to the Subject Site. However a search of the South Australian Heritage Register identified three locations close to Ceduna that are currently listed on the South Australian Heritage Register. These include Point Collinson Whaling Station, Smoky Bay, Former McKenzies Landing within Murat Bay and Our Redeemer Lutheran Church of the former Koonibba Mission.

9.2.10 Waste Sewage

The airport site currently has no sewer service. There is one known septic system on the airport, adjacent to the terminal building. The septic tank is concrete and located at the rear of the terminal in the landscaped area and it drains to a soakage trench between the Highway and car park, from the entrance gates to the exit gates.

Solid Waste

The Council collects solid waste on a regular basis from the airport for disposal to a landfill licensed under the *Environment Protection Act 1993*.

9.2.11 Sustainability

Energy and Water Conservation

No energy audit has been conducted at the airport to date. Likewise no water audit has been conducted at the airport to date. Therefore no information is available with regards to efficiency measures that could be implemented at the airport to reduce water consumption.

Carbon Accounting

The airport's carbon footprint has yet to be calculated. The airport facility is of a size which is unlikely to trigger mandatory reporting thresholds under the *National Greenhouse and Energy Reporting Regulations 2008*.

Sustainable Development

The Council has recently completed the upgrade of the wastewater treatment plant and irrigation systems of local sporting fields and open space to facilitate the use of treated wastewater for irrigation. By using treated wastewater in place of potable (drinking) water significantly less potable water will be used in the town which has the added benefit of cost savings.

9.3 Potential Impacts of Development

9.3.1 Flora and Fauna

General removal or clearance of this native vegetation would require consent under the *Native Vegetation Act 1991*. Clearance of native vegetation for the erection of a building or structure approved under the *Development Act 1993* or within 20 m of a dwelling is exempt from requiring approval under the *Native Vegetation Act 1991*.

Future developments would need to take into account the potential for bird attraction. This is required for both construction activities as well as the type of development proposed. Developments on airport will require the completion of a risk assessment to ensure that it does not increase the risk of bird attraction to the airport. Construction activities will require a Construction Environmental Management Plan (CEMP) to address bird attraction during the construction phase.

9.3.2 Surface Waters

Stormwater treatment requirements for the future development of the site would be stipulated through the development approval process in accordance with the *Development Act 1993* and the *Ceduna Council Development Plan*. The *State Guidelines for Urban Stormwater Management* (Planning SA, 2002) outline objectives for urban stormwater management at a site level. These guidelines encourage the containment and management of stormwater pollutants within the site to minimise export to downstream systems as well as the on-site retention and use of stormwater using safe means (e.g. rainwater tanks).

The *Ceduna Council Development Plan* (consolidated October 2008) outlines various policies for stormwater management to encourage the onsite re-use and treatment of stormwater to minimise the discharge of sediment, suspended solids, organic matter, nutrients, bacteria, litter and other contaminants to the stormwater system.

9.3.3 Soil and Groundwater

Prior to any future development a baseline environmental site assessment (ESA) should be undertaken in accordance with the *Environment Protection Act 1993* and the *Assessment of Site Contamination National Environment Protection Measure* (NEPM).

This will establish the contamination status of the soil and groundwater at that particular site prior to the commencement of the activity.

Limited information on the pre-existing condition of soil and groundwater at the site is available therefore any additional data will be useful in establishing a set of baseline data as part of the environment site register.

9.3.4 Air Quality

There are no known air quality issues with the exception of occasional dust generation.

The major pollutant sources are:

- aircraft startup and idling;
- motor vehicle traffic;
- ground equipment (tankers, loaders, construction equipment);
- storage of aviation fuel;
- construction activities; and
- maintenance activities in hangars and workshops.

9.3.5 Noise

With the anticipated resource development to the northwest of South Australia expected to take place over the next few years, there is a high likelihood that the Council could experience a moderate growth in aircraft movement.

A noise assessment should be undertaken by a suitably qualified consultant to determine the potential noise impact on nearby residents as well as the township of Ceduna. This should include provision of information to residents on the expected number of overhead aircraft movements per day as well as information on flight paths.

9.3.6 Archaeology And Heritage

The airport has been included in the current ILUA by the District Council of Ceduna to identify sites of Aboriginal significance prior to future developments on-airport, which may include the terminal relocation, upgrading the 17/35 runway and the Eyre Highway industrial park.

9.3.7 Waste

Construction waste generated as part of new developments will be managed via a CEMP to ensure disposal meets applicable regulatory requirements. Any new developments will also be required to implement systems to ensure that waste is removed off site in accordance with the *Environment Protection Act 1993*.

9.4 Environmental Management

9.4.1 Environmental Risk Management

A number of priority areas will be addressed to ensure environmental best practice. The following sites on airport pose the highest risk to the environment:

- fuel farm;
- apron areas;
- maintenance compound; and
- septic system locations.

A comprehensive program will be developed to ensure that fuel storage, both aboveground and underground, complies with the requirements of the relevant Australian Standard. Other requirements for fuel management include implementation of a tank integrity testing program as well as establishing systems for effective inventory control and work health and safety.

A number of locations including areas of fuel storage and the location of septic systems pose a high risk to soil and groundwater quality therefore baseline environmental site assessments will be required. These will be undertaken using a risk management approach and the investigations will be aligned with the *Assessment of Site Contamination National Environment Protection Measure* (NEPM).

9.4.2 Remnant Vegetation Management

The airport currently has two areas of remnant Mallee/Teatree low open woodland located on the airport along the southern boundary. General removal or clearance of airport vegetation would require consent under the *Native Vegetation Act 1991* unless for the erection of a building or structure approved under the *Development Act 1993* or within 20 m of a dwelling.

Nonetheless, informal Council policy supports a flora survey to be followed by compensation for habitat removal. Council undertakes to allocate the larger of the remnant vegetation areas into a Conservation Precinct and manage this area for enhanced ecosystem goals, within the context of the Wildlife Hazard Management Program at the airport.

9.4.3 Environmental Management System

Council will develop an Environmental Management System (EMS) to align with the requirements of AS/NZS/ISO 14001 (Environmental Management). Integral to an EMS will be the adoption of a Sustainability Policy as the foundation of the management system. The environmental management system will be implemented at Ceduna Airport to ensure that risks are identified and managed, monitoring and management actions are implemented and a framework for continuous improvement is provided.

An example of an environmental management plan to manage surface water issues will include development of objectives and targets relating to surface water management, implementing identified actions to mitigate the highest risks on airport and implementing a stormwater quality monitoring program as required.

9.4.4 Wildlife Hazard Management Plan

Effective wildlife management is required to maintain the safety of an aerodrome. Council will continue to review and improve the existing Wildlife Hazard Management Program.

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