Broken Hill Airport
Master Plan 2008
Broken Hill City Council

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Executive Summary

Background
The 2008 Broken Hill Airport Master Plan has been prepared by Aurecon Pty Ltd on behalf of the Broken Hill City Council.

The Airport Master Plan covers a 20-year horizon and aims to identify any infrastructure upgrades or other changes required to enable continued growth and development (both aviation and non-aviation) at Broken Hill Airport.

Council's objectives in commissioning the preparation of the Airport Master Plan include a desire to:

- Achieve the best outcomes for Council, the Broken Hill community and the Far West NSW region from the ongoing operation of the airport, and any proposed upgrade of, or lease over airport operation and the airport industry in general;
- Ensure long-term sustainability of Broken Hill Airport;
- Ensure Broken Hill Airport continues to be managed, operated and maintained at a high standard to meet the needs of existing and future users;
- Identify and facilitate any infrastructure upgrades required to cater for the use of larger jet aircraft such as A320 and B737 that are typically used by major budget carriers;
- Promote Broken Hill and the Far West region of NSW as a tourist destination and increase tourist passenger traffic at the airport;
- Facilitate the continued presence of a Royal Flying Doctor Service base at Broken Hill Airport;
- Facilitate additional business and commercial (including non-aviation) development at Broken Hill Airport; and
- Consider alternative airport management and operation arrangements whether by Council or in partnership with a suitably qualified private airport management company if such arrangements present the most logical means of achieving efficient airport operation and traffic growth.

Existing Facilities
Broken Hill Airport is a major regional airport providing important air transport links to South Australia and New South Wales. It supports Regular Public Transport (RPT) services, Royal Flying Doctor Service (RFDS), air charter operations and General Aviation (GA).

The airport has a main sealed runway (05/23) which is 30 m wide and 2,515 m long and a secondary unsealed runway (14/32) which is 30 m wide and 1,000 m long.

The terminal building was constructed in the late 1980s. The building comprises a check-in area, airline offices, a small café and car rental desks. All checked luggage is manually handled and loaded onto baggage trolleys. There are no passenger or baggage security facilities. All passengers departing Broken Hill are considered as non sterile passengers and must be screened on arrival at other destination airports prior to entering the sterile departure areas.

Broken Hill Airport is serviced by water, sewerage (not reticulated), electricity and telecommunications reticulated from the city supply. Aircraft fuelling at the airport is currently provided by both Mobil and BP. Limited freight is carried in the baggage compartment of the RPT services. Air freight is handled by Australian Air Express. There is currently no airline maintenance facility to service aircraft operating RPT services at Broken Hill. The RFDS undertakes it own aircraft maintenance within its own dedicated facilities and General Aviation maintenance services are provided in the GA precinct. Maintenance of the airport facilities at Broken Hill Airport is generally performed by the Broken Hill City Council which has a maintenance compound on site.

There is no air traffic control tower, nor fire fighting and rescue services provided at the airport due to the low number of aircraft movements. The airport operates under a Common Traffic Advisory Frequency and the carriage of radio is mandatory. The airport is equipped with a suite of landing and navigational aids for non precision instrument approaches and night operations.

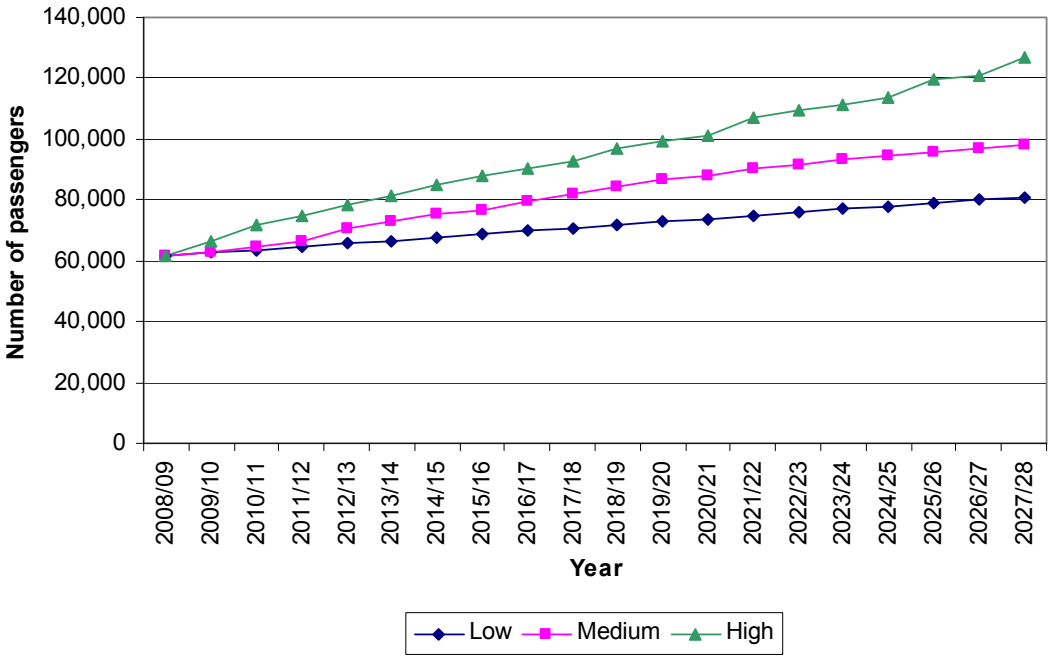
Forecasts

Growth in passenger numbers at the airport has averaged 5.4% per annum over the past ten years, slightly below the Australian average of 6.8% per annum. Revenue passengers have generally increased by between 10 and 20% per annum between 2002-03 and 2007-08, however this was heavily influenced by the previous three years of decline. The 2007-2008 financial year saw 59,561 annual passenger movements across 2,841 airline services. This represents an average of 21 passengers per aircraft.

Passenger forecasts have been developed for Low, Medium and High scenarios on the basis the economic conditions will be sustainable in the medium and long term. The other key assumptions that have been adopted for estimating passenger movement forecasts include:

- Revenue passenger movements for 2007/08 have been used as the base year although it is acknowledged that this year is the culmination of 5 years of high growth;
- Resident population to remain around 20,000 in line with estimated resident population over the past decade;
- Sustainable and buoyant resource sector;
- Constant economic activity across other sectors;
- Fly-In/Fly-Out (FIFO) labour to provide the employment top-up for new construction activity and ongoing operational activity pertaining to the resources sector;
- Recent announcements regarding mining production cut backs are considered short term issues only; and
- Economic uncertainty will always exist and cannot be periodically or systematically included in the medium and long term forecasts.

The Low, Medium and High forecasts for passenger movements over the next 20 years are shown below.



Based on the no growth in permanent population assumption, short term declining economic conditions, and medium to long term uncertainly in the Broken Hill resources sector, the Low forecasts are considered to represent the “most likely” scenario at this point in time. The future buoyancy or otherwise of the resources sector in Broken Hill remains the key factor in the medium and long term influencing future revenue passenger forecasts.

Airport Master Plan

The purpose of an airport master plan is to document the perceived development of the airport from its present configuration to its ultimate optimum configuration over the planning period and to make this information available to all stakeholders and other interested parties. The master plan is, in essence, a site reservation plan that optimises the long-term layout of facilities in a manner that satisfies the strategic, operational and functional needs of the airport while minimising its impact on the local environment. The master plan is a management tool to assist in the planning and development of facilities in a rational, logical and economical manner without compromising existing operations.

The principal objective in undertaking the master planning is to provide a realistic representation of the future airport layout that will maximise the capacity of the site in a way which is compatible with the environment, the local community, and rational development of facilities, and yet maintain flexibility to cater for future changes in response to the dynamic aviation industry.

Based on the Low forecasts, the 2008 Airport Master Plan makes provision for the following facility developments:

(a) Runways

The existing 05/23 Runway is retained. The current width of 30 m and runway length of 2,515 m is generally suitable for all aircraft operations within the planning horizon. Although not required, it is noted that further extension of the 05/23 Runway towards either the north-east or south-west or a combination of both is possible, if ever required. This would be subject to additional land acquisition and Council may wish to consider preserving this area for any future runway expansion, should it be required.

The runway pavement strength is suitable for the current traffic comprising propeller-driven aircraft, but upgrading will be required for to accommodate larger jet aircraft (A320/B737). The upgrading would consist of an asphalt overlay and the depth of the overlay would be dependent on future aircraft operating weights, destinations and frequencies of operation. To allow unrestricted weight and frequencies of A320/B737 aircraft, the existing PCN value of 15 would need to be increased to PCN 44.

The 14/32 Runway is retained in its current configuration. In the long term, and depending on the practicality and cost of maintaining the gravel surface, consideration should be given to sealing this runway.

(b) Taxiways

The master plan retains all existing taxiways, and provides for a new full length parallel taxiway on the northern side of the 05/23 Runway.

A new connecting taxiway is provided between the 05/23 Runway and the GA apron area to facilitate GA aircraft movements and to avoid these aircraft using the main taxiway access to the RPT, Commuter and RFDS Aprons.

The pavement strength of the existing taxiways linking the runway and the RPT Apron is suitable for the current traffic comprising propeller-driven aircraft, but strengthening will be required for larger jet aircraft types, similar to the 05/23 Runway.

(c) RPT Apron

The master plan provides for the development of the RPT Apron to the west and north-east to suit the future terminal development. It has been assumed that the apron will continue to operate under power-in/power-out arrangements, even in the longer term.
The proposed apron development can accommodate three Code C aircraft in the short to medium term, with provision for a fourth Code C bay towards the north-east.

The pavement strength of the existing RPT Apron is suitable for the current traffic comprising propeller-driven aircraft, but strengthening will be required for larger jet aircraft types.

(d) General Aviation Area

The master plan includes the retention of the GA area at the north-east end of the terminal, and allows for future additional demand for facilities that cannot be accommodated in this area to be handled by the provision of new facilities on the eastern side of Taxiway B.

The RFDS is retained in its current location with provision to expand its hangar and the public car park area.

(e) Terminal Building

The terminal needs to be developed in line with the projected growth and legislation at the time of any proposed works. The critical issue in any redevelopment is to ensure that terminal is functional, way finding is easy, and where possible the layout provides flexibility.

Key functional issues to be considered for planning purposes for the redevelopment of the terminal at Broken Hill Airport include:

- Introduction of passenger and baggage screening requirements;
- Segregation of circulation paths for arriving and departing passengers;
- Automation/semi-automation of baggage make-up/break-down facilities to cope with OH&S and larger aircraft requirements;
- Provision of adequate customer check-in facilities with automated baggage handling systems and ability to introduce checked bag screening if required;
- Provision for future additional airlines;
- Provision of adequate passenger lounge area and seating with ability to introduce security screening if required;
- Provision of improved amenities including larger concessions facility, additional toilet facilities and improved disabled access; and
- Provision of additional passenger vehicle drop-off and pick-up positions outside the terminal, additional short and long term car parking, secured long term park, taxi rank bays and tour bus parking.

The existing terminal requires upgrading to accommodate jet services. The introduction of jet services would automatically trigger the requirements for the introduction of passenger and baggage screening services. The extensions to the existing terminal, while addressing the functional issues noted above would be designed to compliment the existing architecture and develop and enhance the quality of the original design aesthetic.

(f) Roads and Car Parks

The Airport Master Plan includes the provision for the following upgrades to existing facilities:

- New access road to RFDS facility.
- Rearrangement of the intersection of the airport access roads and the roads linking to the terminal and car park. This should proceed in the short term to avoid any safety issues.
- Long term expansion of the RPT car park to the north to suit the terminal development.

(g) Support Facilities

Aircraft Refuelling

The Airport Master Plan retains space to the west of the existing Mobil fuel depot for further development of fuel storage and servicing. While no significant increase in the RPT services is forecast in the short to medium term, there is no immediate upgrading of the facilities likely to be required.

Airline Catering
Current trends at regional airports are that airlines carry onboard catering from the main capital city airports. It is envisaged that this trend will continue into the future and there is no provision in the master plan to provide for airline catering activities at Broken Hill Airport.

Air Freight
No new facilities are required in the short term. Sufficient potential lease areas exist in the terminal area for the short to medium term requirements. The Airport Master Plan contains provision for the development of a dedicated air freight facility at the eastern end of the abandoned 07/25 Runway.

Aircraft Maintenance
Allocation of development areas in the north-eastern GA area provides sufficient land with landside and airside access and proximity to existing infrastructure to provide for future expansion of general aviation maintenance facilities.

Aircraft Storage Area
During the consultation phase, an opportunity arose in relation to using Broken Hill Airport for either short or long term aircraft parking/storage. The Airport Master Plan contains provision at the eastern end of the abandoned 07/25 Runway to allow for aircraft to be parked either on a short or long term basis.

Airport Maintenance
The existing airport maintenance area is well located and of sufficient size to meet future needs.

Aero Club
The Aero Club of Broken Hill presently operates on land adjacent to the terminal entry road, and the facilities are retained in the present location in the Airport Master Plan.

(h) Operational Facilities

Aircraft Rescue and Fire-Fighting Service
These services are provided off site by the local fire and emergency services located in the City of Broken Hill and no changes to the existing arrangement are required.

Navigation and Landing Aids
The airport is well served by the existing navigational aids. The Airport Master Plan retains all of the existing navigation aids in their current locations.

(i) Engineering Services

Stormwater
Stormwater runoff from the existing buildings and hardstand areas is generally collected by an underground pipe system and delivered to an open swale system within the airport site which is then discharged on to private property. There is no pollution control in the existing drainage system. The proposed development of the airport will need to consider the additional stormwater runoff generated from these facilities and the impact on the existing stormwater system.

Power Supply
The main electrical supply to the airport comes through the area designated for short to long term car park expansion. An upgrade of the power supply will be required to meet the forecast demand.

Water Supply
The current potable water supply is provided by Country Water. Based on the future theoretical demand, the existing internal supply system will be sufficient to continue servicing the terminal building, however a separate system will be required for any business park developments.

Sewer
Country Water is the sewer authority and provides a service to the main airport entrance gate. It is anticipated that the existing internal system will not have capacity to cater for the business park development. The existing system is anticipated to continue to service the existing terminal and RFDS buildings, with a separate system provided to service a business park.

Commercial Precinct Development

In order to increase revenue at airports and not be reliant on aviation related income, many airports now identify areas that are not required for future aviation use and where practical and applicable, turn this surplus land into non-aviation related activities. Broken Hill Airport has two large parcels of land to the north of the existing airport operational areas that could be developed into aviation and non-aviation related business parks. However, the development of the business parks would need to be developed after undertaking a sound marketing assessment, business and economic analysis.

Airport Development Strategy

The following summarises the strategies for the short, medium and long term development of the airport.

(a) Short Term Development (2008-13)
No major changes to current services are envisaged aside from the possible introduction of Virgin Blue EMB 170 aircraft towards the end of the period. Accordingly, it is unlikely that any significant airside works will be required for RPT traffic.

Depending on future security legislation, there may be a need to enhance existing security requirements, including passenger and baggage screening.

The vacant land that is directly adjacent to the north of the GA facility has been identified as non-aviation and could be developed for commercial activities and either sold freehold or leased.

The works to be undertaken in the short-term are listed below.

Airside
No change to the airside parking is envisaged. The high forecast shows the introduction of jet aircraft at the end of the forecast period. This will require a re-marking of the apron and operations will be on a restricted weight basis on the existing pavement.

Landside
Provide additional car parking at the terminal.

Terminal Building
Monitor and upgrade security requirements as required to ensure compliance with Federal Government security legislation.

The existing terminal will be able to cope with the projected turbo-prop aircraft traffic within the given timeframe; however, an introduction of jet operations will trigger an upgrade of the security requirements (i.e. passenger, carry on luggage and checked bag screening).

(b) Medium Term Development (2013-20)
Development in this phase is expected to be dictated by any changes to airline fleets or route structures. If services continue to be provided by relatively small propeller-driven aircraft, no changes to the airside facilities will be required. However, provision should be included to undertake regular cyclic resurfacing of the 05/23 Runway, taxiway and apron pavements.

The terminal upgrading, if not already implemented, should proceed, and car parking capacity may need to be increased based on the increased traffic.

Further security improvements may be necessary including a requirement for all carry on and checked baggage to be screened by X-ray and/or explosive detection.

The works to be undertaken in the medium term are listed below.

Airside
- Design and construct asphalt resurfacing of the 05/23 Runway, and the taxiways and apron used by RPT aircraft.
- Continue development of GA taxiways and aprons as required depending on the demand for GA lease areas.
- Plan for the initial stage of the parallel taxiway to the 05/23 Runway, based on a needs requirement.
- Expansion of the RPT apron may be required to satisfy the busy hour peak. This will be airline schedule dependent.

Landside
- Provide alternative road access to the RFDS facility and bus parking.
- Increase car parking capacity and provide rental companies with designated areas and/or onsite service centres.
- Further development of landside infrastructure to the GA area.

Terminal Building
- Undertake terminal building expansion if not already completed.
- Implement baggage screening requirements (if required by legislation).
- Install baggage reclaim system for OH&S requirements.

(c) Long Term Development (2020-28)

The works proposed in this time frame are entirely dependent on the nature of the traffic operating at the time. Assuming that the demand for air travel has increased sufficiently to warrant larger aircraft, general upgrading of all facilities may be required.

The works to be undertaken in the long-term are listed below.

Airside
- Provide the final part of the parallel taxiway to the 05/23 Runway, subject to justification by capacity/delay issues.
- Undertake further GA area development as required by demand, including new connecting taxiway between the GA apron area and the 05/23 Runway.

Landside
- Fully develop public car park to extended Terminal Building.
- Fully service GA lease areas.

Terminal Building
- Upgrading as required to suit passenger numbers.

Indicative cost estimates (at current 2008 dollar values with no provision for cost escalation in the future, and exclusive of GST and contingencies) have been prepared for the short, medium and long-term works and these are $3.2M, $10.4M and $6.8M, respectively.

Business Plan

The approach in developing the Business Plan for Broken Hill Airport is based on a number of important premises comprising:

- The airport is not likely to receive any sort of significant funding from external sources for operations and development and therefore Broken Hill City Council, as owner and operator, has to make provisions for such development from existing and/or prospective sources of airport revenue, including possible partnering with other companies or institutions;
- How the airport is to be developed and how best use of the land is to be achieved should be driven by commercial and demand considerations; and
- The airport development has to benefit aviation and the Broken Hill regional catchment both economically and socially. Where possible, the risk should be borne by all the major beneficiaries of the airport development in the region and not just Broken Hill City Council in its role as owner/operator of the airport.

Over the life of the master plan, Broken Hill Airport has the potential to experience a major expansion in airside infrastructure including terminal upgrading, runway strengthening, and associated taxiway and apron developments as part of a move to larger aircraft and/or jet operations. The airport site could also realise significant expansion in aviation and non-aviation businesses. This level of development at Broken Hill Airport over the period of this master plan is conditional on how Broken Hill City Council adopts the capital investment program within the Business Plan.

Marketing Plan

Broken Hill Airport needs to diversify its revenue base and reduce its dependence on passenger landing aviation fees. This could be accomplished through a greater focus on attracting aviation and aviation support industries, land development and growth of complementary businesses.

The key to Broken Hill Airport's future from a scheduled air services perspective is making air travel more affordable to the permanent population in and around Broken Hill region, while retaining existing service levels and also using scheduled air services to generate tourist visitations to the region as a stimulus to further economic development.

Broken Hill is only serviced by a single airline (Rex) and the current level of demand does not justify a second operator on current routes, however there may be opportunities for other airlines on new (non-competing) routes. QantasLink currently operates Melbourne to Mildura and it would be logical to offer some connecting services from Broken Hill to Mildura.

The tourism potential of the Far West NSW is significant and domestic and international visitors should be vigorously targeted. It is understood that Broken Hill Council has an active tourism marketing strategy.

General Aviation (GA) and GA support industries are not well represented at Broken Hill Airport, primarily due to its remote location. GA flying usually attracts a range of ancillary/support industries to the airports from which GA aircraft operate. Therefore the larger the local GA aircraft fleet based at Broken Hill, the greater will be the range of GA support activity in not only maintenance but in aviation support activities. GA aircraft owners, particularly those engaged in non-commercial operations will be likely to make their base at or utilise airports with low or no aeronautical charges in order to reduce the costs associated with flying. Broken Hill City Council currently has in place a fee for all aircraft types landing at the airport. In order to attract aircraft to be based at the airport, this policy should be reviewed.

With the current economic downturn and the flow on effect to the aviation industry, several airlines and aircraft operators in Australia have placed some of their aircraft into short term storage. Broken Hill due to its dry climate and distance from the sea would make an ideal storage area.

Another of the aviation related opportunities to develop Broken Hill Airport is the potential to develop an air park precinct at the airport. Air parks which originated in America are now being developed in Australia. Air parks provide aircraft owners with the opportunity to build a residence and aircraft accommodation hangar on the same land parcel within a single building.

The undeveloped vacant airport land has considerable commercial potential to the Council and to the airport. However, there are a number of regional airports with similar parcels of undeveloped land awaiting interests from prospective developers. Successful airport development requires available land, the demonstrated need for the development to occur, the financial capability of the proponent to complete the desired project and a supportive community. An airport has the ability to attract new businesses and new lessees, which increases and diversifies the airport's revenue stream, provides increased revenues to the airport owner, and most importantly, increases the employment base of the local economy.

The key issues are:

- Broken Hill Airport has a potential market disadvantage because it does not offer jet or Low-Cost Carrier services.
- Broken Hill Airport is served by turbo-prop aircraft at a time when air travellers are expecting that jet services be used.
- The extent of General Aviation and aviation support industry activity at Broken Hill Airport does not match the high quality of the airport infrastructure.
- The potential demand of vacant airport land including the possible identification of highest and best use scenarios could be cost effectively tested through the conduct of a market study by a nationally prominent property consultant.
- It would be desirable for Council to retain a strong planning and managing control of vacant land with direct access to airside aviation infrastructure. This land should be preserved for aviation industry needs. The remaining vacant airport land is a valuable commercial asset but with limited strategic importance and hence should be divested by Council for its highest and best use.

The following actions are proposed:

- The Broken Hill region has a sustainable future as an origin/destination for the local regional population and most importantly for the developing tourist market providing the issues of low fares, low fare seat availability and jet services are addressed.
- A concerted marketing program in conjunction with the Broken Hill Council Tourism Department and Chamber of Commerce should be developed targeting the local population catchment, key tourist outlets and publications in and around Broken Hill.
- Council should meet with the key executives of Jetstar, Tiger and Virgin Blue with a view to discussing future infrastructure planning and the possibility of attracting more scheduled air services. The important issue here is to build relationships and knowledge so that Council is more aware of the air services market and the intentions of major RPT operators.
- Airlines attract air travellers who in turn provide the passenger landing fee revenue for Broken Hill Airport. Formal airline meetings should take place on a half yearly basis which constructively put forward Council's views on key airline operations issues.
- Broken Hill Airport must seek to optimise commercial land opportunities. Broken Hill City Council's large land base at the airport is a valuable asset and it is recommended that development options be explored.

Airport Management Options

Broken Hill City Council has resolved to consider alternative management and operations arrangement. There are a range of possible governance models/structures suitable for the airport. These include:

- Council Department;
- Business Unit;
- Council Organisation (trust); and
- Independent Organisation (company).

The preferred model of management will be subject to Council's consideration after due process has been followed and stakeholder consultation undertaken.

As an alternative to the above, Council should also give due consideration to divesting the airport in whole or part. This would be subject to government land purchases and sale regulations and may also require complying to federal legislation in relation to previously owned federal assets.

Stakeholder Consultation

Stakeholder consultation between representatives from the Broken Hill City Council, airport staff and local operators was undertaken. The basis of the planning was outlined to each stakeholder and their questions, comments and discussions were noted.

On 2 September 2009, Aurecon presented the final draft of the Airport Master Plan to key Council members, stakeholders and the general public. Following the formal presentation to Council, the Airport Master Plan was placed on Public Display for a further 28 days from the 3 September 2009, with no further public comment received.

Airport Master Plan Review

The Airport Master Plan should be treated as a living document and should be reviewed on a regular basis. The normal review period is five years, however, if a significant opportunity is presented to Council or a major event occurs, this may also trigger a review of the Airport Master Plan before the normal review period.

Airport Master Plan Adoption

Adoption of this master plan does not represent a commitment by the Broken Hill City Council to provide the facilities described, or to adhere to the facility locations and dimensions, or to follow the time scales as documented. Additionally, promulgation of the master plan does not obviate the requirement to evaluate and justify specific developments at the time that they are proposed.

1. Introduction

1.1 Background

In January 2007, a report on "Broken Hill Airport Development Initiative" was prepared by SRA Consulting on behalf of the Broken Hill City Council (BHCC). This report included background information on the Broken Hill region and the airport which is relevant to the preparation of the airport master plan. It is reproduced (in part) below to provide context for the 2008 Airport Master Plan.

"The Far Western region of NSW lies inland from the Orana region and bordered by Queensland and South Australia; it encompasses the local government areas of Broken Hill, Central Darling Shire and the Unincorporated Area of NSW and occupies18.4% of the total area of NSW.

Broken Hill is the largest regional centre in the western half of New South Wales. It is surrounded by, and is a regional service centre to, the Unincorporated Area of NSW and adjoining shire and district communities.

The region is geographically large and remote – being isolated from major capital cities. This adds to the region's challenges in terms of maintaining and creating employment, business development and service delivery. Geographical isolation increases the importance of transport infrastructure and services in all aspects of socioeconomic performance.

The main industry sectors are mining and wool, although horticulture, tourism and retail/services make substantial, and growing, contributions to economic activity and employment. Efficient, large scale mining operations concerning silver, lead and zinc is a major source of economic activity and employment.

The region's key strategic advantages in terms of traditional primary sectors lie in its abundant (albeit ultimately finite) mineral resources, and agricultural capacity and seasonal production advantages. In terms of tourism (and the art and film sectors) key advantages lie in its natural, 'under-developed' tourism product, its unique environmental characteristics and its capacity to leverage on 'outback' promotional themes. Key challenges or disadvantages arise from structural shifts in economic activity, regional isolation and 'remoteness' as well as labour-force skills shortages; all of which can be substantially ameliorated through provision of cost and time efficient air services.

A key growth challenge will be the attraction of sufficient skilled labour. Previous research undertaken by the Outback NSW Area Consultative Committee has highlighted key regional labour market skills shortages and demand for more employees. The capacity to attract employees, and employees' access to skills development opportunities, are heavily influenced by transport services – particularly air services in remote areas. Provision of high-quality, time-and cost-efficient air transportation will be an important factor in attracting skilled employees to the region to meet the labour market demands of major projects taking place, and the structural shifts occurring in the regional economy.

Infrastructure constraints often exist in regional areas; undermining the capacity of communities to effectively respond to structural changes and opportunities for socioeconomic development. Solving infrastructure 'bottlenecks' has, time and again, allowed regional areas to unlock their productive potential, create new business and attain sustainable and prosperous futures. Effective transport infrastructure and services assumes even greater importance in remote areas; where options for fast, cost-and time-efficient transport are limited by the 'tyranny of distance', air transportation assumes critical importance. This view is evidenced by the 2004 Institute of Economic and Industry Research (NIEIR) study which found that economies of regional communities with regular passenger air services of any type grew 1.85 times faster than those without them and regions with competitive air routes grew 1.4 times faster: this fact leading the Regional Aviation Association of Australia to conclude that regions with larger, jet aircraft will thrive while those without them will probably decline.

Tourism is an increasingly important part of the Far West NSW regional economy. Total tourism consumption in NSW is $23.3 billion (32.7% of Australian tourism consumption) and it generates some 246,000 jobs (8.1% of the total workforce in NSW). As the closest part of the unique Australian outback to the major international getaways of Sydney and Melbourne, the Far West NSW region attracts growing numbers of visitors every year.

There are significant changes occurring in domestic and international tourism and these will continue to affect the nature and level of tourism demand into the future. As a consequence these trends, regional destinations without larger, cost-efficient air services are at a distinct (and growing) competitive disadvantage. Affordable air travel to regional areas will become vital for maintaining and growing regional tourism in future:

Faster travel modes are now more appealing to all travellers, for people of working age it is not so much the cost of holidays, but the cost of time which is largely impacting on regional tourism; for those of retirement age, time capacity exists but affordability of traditional self-drive modes is being reduced by escalating fuel costs. Air travel is becoming more affordable and its use is increasing.

As propensity for travel from many regional areas has declined, cost-efficient and convenient links to other markets where declines have not occurred is important for regional tourism centres if they are to maintain or develop their tourism industries.

Affordable, convenient air services are important in terms of competition with increasingly competitive air fares to international destinations. Domestic tourism destinations, more than ever before, require cost-effective and efficient air services if they are to effectively compete with overseas tourism destinations.

Air service links to major international gateways, and even capacity to accommodate international flights, will be an important factor in terms of gaining market share from the growing international inbound market.

Broken Hill, and the wider region, has excellent potential to capitalise on opportunities associated with further tourism industry development. Broken Hill itself is a very significant historic city. Many built attractions and natural features are located in Broken Hill and the surrounding region. Broken Hill has very good supporting infrastructure and services: a very good accommodation stock (in terms of capacity and range); a variety of food, beverage and entertainment and other enterprises of interest or use to visitors; and a good range of tourism services and enterprises relevant to visitors. Numerous tour enterprises operate in the region, offering a range of experiences to visitors, adding significant value to the regional tourism product. Broken Hill is also strategically placed as a major stop for both the Ghan and Indian Pacific on the major Sydney-Perth rail line -providing an excellent basis for package tours catering to combinations of transport modalities (e.g. fly-drive, and fly-rail packages).

Broken Hill Airport is professionally and successfully managed by Broken Hill City Council. In 2003, the Australian Airports Association awarded Broken Hill Airport "Australian Rural Airport of the Year". Rex Airlines currently provides daily flights to Sydney and Adelaide using 34 seat Saab turbo-prop aircraft. Flight pricing is relatively expensive. Nevertheless, Broken Hill airport shows strong passenger growth: over 2002/03-2005/06 total passengers grew by 49.7% (14,479 passengers) over the period - representing average trend growth of 14.4% p.a. This growth is highly significant (in fact quite remarkable) given that it has occurred in the context of current service types and fares.

Considerably higher growth could be expected from the introduction of mainstream carriers providing faster travel at lower fares even without route expansion; and introduction of additional routes would likely stimulate even higher growth.

Before provision for depreciation Broken Hill airport delivered net operational profits in 2001/02 and 2005/06; and net operational losses from 2002/03-2004/05. Overall operational performance is slightly below breakeven -over the 5 year period the net position was a loss of circa $52k. When incentive costs are taken into account the position is consistent operational profit – over the 5 year period the net position being an operational profit of $229k.

Council is seeking to upgrade current airport infrastructure to overcome constraints presently preventing use of the airport by major budget carriers, limiting regional flight capacity and prohibiting direct international flights, or major domestic link flights between Broken Hill and major gateway airports. This in turn constrains the potential of Broken Hill and wider Far West NSW region to capitalise on: trends in tourism yielding good potential for further development of regional tourism, as well as growth and employment opportunities associated with recent resurgence in mining activity and other large-scale investment projects.

Infrastructure upgrades are a necessary pre-requisite -without the proposed upgrades Broken Hill airport will not be capable of servicing jet aircraft; without the ability to service jet aircraft, Broken Hill airport will not be attractive to professional airport management firms."

The unexpected and severe downturn in mineral prices since the initiative was completed by SRA highlights the cyclical nature of Broken Hill's economy and its continued dependence on mining. Notwithstanding the latest downturn in mining activity, Council remains confident of future mining (and other) industries in Broken Hill and wishes to be in a position to manage and develop its airport infrastructure in a manner that is commensurate with the expected growth of the aviation over the next 20 years.

Having a Broken Hill Airport Master Plan development strategy will enable logical development and town planning that will ensure the long-term ability of the airport to serve the Broken Hill community and the wider regional catchments.

1.2 Terms of Reference

The Terms of Reference prepared by the Broken Hill City Council identified the aims and objectives of the project as follows.

1.2.1 Aim of the Study

The aim of the study is to prepare a 20-Year Master Plan for Broken Hill Airport, with particular emphasis on identifying any infrastructure upgrades or other changes required to enable continued growth and development (both aviation and non-aviation) of Broken Hill Airport.

Council's objectives in commissioning the preparation of the Airport Master Plan include a desire to:

- Achieve the best outcomes for Council, the Broken Hill community and the Far West NSW region from the ongoing operation of the airport, and any proposed upgrade of, or lease over airport operation and the airport industry in general;
- Ensure long-term sustainability of Broken Hill Airport;
- Ensure Broken Hill Airport continues to be managed, operated and maintained at a high standard to meet the needs of existing and future users;
- Identify and facilitate any infrastructure upgrades required to cater for the use of larger jet aircraft such as A320 and B737 that are typically used by major budget carriers;
- Promote Broken Hill and the Far West region of NSW as a tourist destination and increase tourist passenger traffic at the airport;
- Facilitate the continued presence of a Royal Flying Doctor Service base at Broken Hill Airport;
- Facilitate additional business and commercial (including non-aviation) development at Broken Hill Airport; and
- Consider alternative airport management and operation arrangements whether by Council or in partnership with a suitably qualified private airport management company if such arrangements present the most logical means of achieving efficient airport operation and traffic growth.

1.2.2 Objectives of the Study

In completing the study, the following are to be considered:

- The provisions of the 2008/2013 Management Plan together with all plans referenced in the Council Planning framework contained in the plan;

- Airport revenue and expenses for the past five years and benchmarking against similar regional airports;
- The needs of all existing stakeholders at the airport;
- The impact of current and proposed legislation that would apply to the ownership, operation and management of Broken Hill Airport;
- Passenger growth trends – both past and forecast, for established RPT routes;
- Potential market for additional RPT routes and their impact on existing operations;
- Potential market for Low-Cost Carriers and their impact on existing operators;
- Potential for non-aviation developments at the airport and their impact on existing operations.
- General Aviation trends and potential impact on existing operations;
- Benchmarking of the existing operations with similar regional airports to identify opportunities for improvements;
- Existing infrastructure including:
  - Available land;
  - Extent and condition of runways;
  - Extent and condition of terminal building and other supporting infrastructure;
  - Car parking facilities;
  - Utilities including:
    - Water and sewerage;
    - Fire hydrant system;
    - Runway lighting system;
    - Electricity;
    - Transport;
    - Emergency Services; and
    - Telecommunications.

The following objectives are to be met:

- Prepare a Master Plan for Broken Hill Airport in accordance with recognised industry standards appropriate for a regional airport in New South Wales. The Master Plan is to provide a framework for the development of the airport over the next 20 years. The consultant should research and analyse the existing infrastructure at Broken Hill Airport against current and projected aircraft and passenger visitation numbers. The Master Plan should present the logic and research from which the plan was evolved and display the plan in a graphic and written report.
- Provide a strategic document which will facilitate sustainable development (both aviation and non-aviation) at Broken Hill Airport.
- Provide a strategic document which would assist Council to apply for funding from Government programs for upgrade of the airside and landside infrastructure.
- Consult with key stakeholders to determine future needs for the airport and incorporate these into the plan. In particular, determine if a major step in passenger and aircraft traffic is likely beyond that anticipated from incremental growth of the current air services and any resultant infrastructure upgrade requirements.

1.3 Airport Master Planning Objectives

The continued growth of population in the Broken Hill region and the development of tourist, commercial and industrial facilities dictates the need for Broken Hill Airport to be able to cope with an increased in demand for airline services and General Aviation activity.

In planning to meet this expanding demand, a number of important considerations have been defined, including the following:

Aircraft Safety

The safety of aircraft operations is paramount. The planning and development of facilities are therefore based on established national standards.

Airport Capacity

The increase in aircraft movements, passengers and freight will be supported by the expansion of facilities such as aprons/taxiways, terminals, freight facilities, car parking, ground access and other associated infrastructure.

Forecast Demand

Aviation traffic is forecast to the year 2027/28 under Low, Medium and High forecast scenarios, reflecting the range of possible demand for aircraft services.

Regional Planning

The development of Broken Hill Airport should be considered in terms of the regional development context. This means taking into account community impacts of air transport growth, particularly factors like aircraft noise, airspace protection and hazard of aircraft operations, whilst ensuring that the airport meets the community's expectations in regard to the provision of services.

The master planning for the airport is also based on the philosophy of planning to accommodate the aviation needs of the Broken Hill region for the long term. This means predicting changes in demand and aviation technology well beyond usual planning horizons. In recent years aircraft performance improvements have generally stabilised the length of runways required for aircraft operating domestic and regional air services. The critical aircraft used for the planning of the airport is the A320/A321 (Code C) although it is not envisaged that this size aircraft will use the airport in the planning period, unless there is exceptional growth in interstate tourism and/or conventions. At the same time, it is necessary to plan to accommodate increased General Aviation aircraft activity.

The planning seeks to allocate sufficient space to meet the long term needs of the various airport activities and identify areas that could be used for non-aviation uses, thereby enhancing the financial income of the airport.

1.4 Stakeholder Interface

Consultation with key stakeholders, neighbouring local authorities and government agencies has formed an integral part in the development of the Airport Master Plan.

The approach has aimed to fulfil the following primary objectives:

- To inform stakeholders about the project;
- To engage relevant stakeholders in the study process;
- To inform and complement the technical work in developing a robust study outcome; and
- To create a basis for future communication and consultation activities to continue, particularly during the implementation phase.

Consultation occurred during March and April 2009 via telephone calls to key users, both aviation and non-aviation based, at Broken Hill Airport. Consultation was undertaken by telephone calls to these users who were then asked a set series of questions, which again related to both aviation and non-aviation uses at the airport.

In addition, the outcomes of the consultation have aimed at enhancing the outcomes of various elements of the study by:

- Considering the stakeholders perceptions and priorities;
- Describing the preferred options for the future; and
- Embracing stakeholder needs and, where appropriate, reflecting them in the technical process.

1.5 Scope of Report

This report on the work undertaken as part of the master planning process is structured as follows:

Executive Summary

- Provides an abbreviated summary of the key points resulting from the Airport Master Plan study.

Section 1 – Introduction

- Provides background information and sets the objectives for the preparation of the Airport Master Plan.

Section 2 – Existing Airport Facilities

- Describes the current facilities at the airport.

Section 3 – Planning and Development Legislative Framework

- Details the Commonwealth, State and Local Government legislative framework that impacts on the Airport Master Plan.

Section 4 – Forecast Demand

- Presents historical data on traffic at Broken Hill Airport, discusses forecasting techniques, and provides low, medium and high forecasts for passengers and aircraft over the next 20 years.

Section 5 – Future Needs and Development Options

- Provides a description of the proposed future operations and forecast traffic, together with the regulatory requirements governing airport planning, including the planning standards adopted.

Section 6 – Stakeholder Consultation

- Presents the results from the stakeholder consultation process conducted as part of the Airport Master Plan study.

Section 7 – Airport Master Plan

- Provides the planning standards adopted, and details of the proposed airside and landside developments to accommodate the forecast traffic.

Section 8 – Environmental and Land Use Planning

- Presents the effects of the proposed airport development on the existing environment and explains how future land use planning is affected.

Section 9 – Airport Development Strategy

- Provides details of the proposed staged airside and landside developments to accommodate the forecast traffic.

Section 10 – Business Plan

- Shows anticipated airport expenditure and identifies potential funding sources.

Section 11 – Management Plan

- Discusses management options for the airport.

Section 12 – Marketing Plan

- Provide details of possible marketing initiatives to increase patronage at Broken Hill Airport.

1.6 Abbreviations

The following abbreviations have been provided to facilitate the reading and understanding of the Airport Master Plan:

AFRU	Aerodrome Frequency Response Unit
AGL	Airport Ground Lighting
ANEC	Australian Noise Exposure Concept
ANEF	Australian Noise Exposure Forecast
ANEI	Australian Noise Exposure Index
ARC	Aerodrome Reference Code
ARFL	Aeroplane Reference Field Length
ARP	Aerodrome Reference Point
ASDA	Accelerate/Stop Distance Available
AT-VASIS	Asymmetrical T-VASIS
AVGAS	Aviation Gasoline
AVTUR	Aviation Turbine Fuel
BHCC	Broken Hill City Council
CAO	Civil Aviation Order
CAR	Civil Aviation Regulation
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulation
CTAF	Common Traffic Advisory Frequency
CTAF(R)	Common Traffic Advisory Frequency (carriage of Radio is Mandatory)
DME	Distance Measuring Equipment
ERSA	En Route Supplement Australia
FAA	Federal Aviation Administration
FATO	Final Approach and Take-Off Area
FIFO	Fly In /Fly Out
GA	General Aviation (GA operations include non-scheduled airlines, charter, private flying, pilot training, aircraft testing, ferrying and aerial work).
GPS	Global Positioning System
ICAO	International Civil Aviation Organisation
IWDI	Illuminated Wind Direction Indicator
LDA	Landing Distance Available
LEP	Local Environment Plan
MOS	Manual of Standards (CASA)
MTOW (M)	Maximum Take-Off Weight (Mass)
NDB	Non-Directional Beacon
OLS	Obstacle Limitation Surface
PAL	Pilot Activated Lighting
PAPI	Precision Approach Path Indicator
PCN	Pavement Classification Number
REP	Regional Environmental Plans
RESA	Runway End Safety Area

RFDS	Royal Flying Doctor Service
RFFS	Rescue and Fire Fighting Service
RPT	Regular Public Transport
SEPP	State Environmental Planning Policy
TODA	Take Off Distance Available
TORA	Take Off Run Available
T-VASIS	T-Visual Approach Slope Indicator System
VMC	Visual Meteorological Conditions
VOR	VHF Omni - Directional Radio Range

1.7 Aircraft Identification

Table 1.1 provides details of aircraft currently operating at Broken Hill Airport or that could possibly operate at Broken Hill Airport in the future.

Table 1.1 Aircraft Identification Guide

Designator	Code	Wingspan (m)	Length (m)	OMGWS (m)	MTOM (kg)	Approximate Passengers
A321-200	4C	34.2	44.5	8.7	93 000	220
A320-200	4C	33.9	37.6	8.7	72 000	150
B737-900	4C	34.3	41.9	6.6	79 000	177
B737-800	4C	35.8	39.5	6.6	70 535	170
B737-700	4C	34.3	33.6	6.6	70 080	149
B737-400	4C	28.9	36.5	6.4	63083	129
B737-300	4C	28.9	30.5	6.4	61230	106
B717-200	4C	28.4	37.8	6.0	51710	106
F100	4C	28.1	35.5	5.0	44450	107
EMB 190	4C	28.7	36.2	5.9	47790	98
Q400	3D	28.4	32.8	8.5	27330	78
EMB 170	3C	26.0	29.9	5.2	35990	78
SF340	3C	21.4	19.7	7.5	12371	34
EMB 120	3C	19.8	20.0	7.3	11500	30
CRJ-200	3B	21.2	26.8	4.0	21 523	50
EMB145	3B	20.0	29.9	4.8	19 200	50
DHC8-300	2C	27.4	25.7	8.5	18642	50
DHC8-100/200	2C	25.9	22.3	8.5	15650	37
B1900	2B	16.6	17.6	5.8	7 530	19
Metro III	2B	17.4	18.1	5.4	6 577	19
King Air 350	1B	16.61	13.34	5.6	5 670	8

1.8 References

Documents that have been referred to during the course of the master planning process included the following:

i) Civil Aviation Safety Authority (CASA)
"Manual of Standards (MOS) Part 139 – Aerodromes"
Version 1.3 – January 2008

ii) International Air Transport Association (IATA)
"Airport Development Reference Manual"
9th Edition – January 2004

iii) SRA Consulting
Broken Hill Airport Development Initiative
January 2007

iv) Department of Transport and Regional Services (DOTARS)
Airport Traffic Data 1993-94 to 2003-04, January 2005

v) Office of Economics and Statistical Research (OESR)
Local Government Area Profiles, January 2005

vi) Tourism NSW
Broken Hill Destination Management Plan, 2007/11

vii) State Priority Plan P6, Regional Business Growth Plan – Far Western Region, October 2008, New South Wales Government Department of State and Regional Development.

viii) AEC Group
Far West Region Growth & Investment Strategy, June 2007

ix) New South Wales Consolidated Regulations
Local Environment Plan, 1996

2. Existing Airport Facilities

2.1 Description

Broken Hill Airport is a major regional airport providing important air transport links to South Australia and New South Wales. It supports RPT services, air charter operations, general aviation and the Royal Flying Doctor Service.

The current airport site and facilities arrangement are shown on **Figures 1 and 2 in Appendix A**.

2.2 Current Operations

Regular Public Transport (RPT) services are currently operated by Regional Express (Rex).

On a weekly basis, Rex offers 15 services between Adelaide and Broken Hill (540 seats each way), 13 services between Sydney and Broken Hill (468 seats each way), and five services between Dubbo and Broken Hill (180 seats each way). These services utilize SF340 aircraft.

Wettenhall Air Services provides local air charter operations, Royal Flying Doctor Services (RFDS) provides aero medical services, a number private operators and an aero club also operate at the airport.

2.3 Movement Area

2.3.1 Runways

The airport has a main sealed runway (05/23) and a secondary unsealed runway (14/32) with details as shown in **Table 2.1**.

Table 2.1 Runway Details

Item	05/23 Runway	14/32 Runway
Aerodrome Reference Code	4C	2C
Runway Length	2,515 m	1,000 m
Runway Width	30 m	30 m
Surface	Sprayed Seal (over asphalt)	Brown Sand (40 m sealed at each end)
PCN Rating	15/F/A/690/T	Unrated (Max 5,700 kg)
Runway Shoulder Width	3 m (sealed)	Nil
Runway Strip Width - Graded	150 m	90 m
Runway Strip Width - Total	150 m	90 m

Take-off and landing distances available are as shown in **Table 2.2**.

Table 2.2 Runway Take Off and Landing Distances

Item	Runway 05	Runway 23	Runway 14	Runway 32
TORA	2,515 m	2,515 m	1,000 m	1,000 m
TODA	2,575 m (1.79%)	2,575 m (1.6%)	1,060 m (1.47%)	1,060 m (2.66%)
ASDA	2,515 m	2,515 m	1,000 m	1,000 m
LDA	2,515 m	2,515 m	1,000 m	1,000 m

Supplementary take-off distances available are as follows:

- Runway 05 – 2,474 m (1.6%)
- Runway 32 – 889 m (2.5%)

2.3.2 Taxiways

There are four taxiways that provide access to the various aprons.

- Taxiway A links all of the aprons to the 05/23 Runway.
- Taxiway B provides a link between Taxiway A and the GA Apron.
- Taxiway C provides a link between Taxiway A and the RPT Apron.
- Taxiway D provides a link between Taxiway A and the RFDS and Commuter Aprons.

Taxiway A is 15 m wide with an asphalt surface and 3 m wide sealed shoulders. It is suitable for aircraft up to Code C standard (B737/A320).

Taxiway B is 15 m wide with an asphalt surface and 3 m wide shoulders. It is suitable for aircraft up to Code B standard. Taxiway B is located along the abandoned 07/25 Runway.

Taxiway C is 15 m wide with an asphalt surface and 3 m wide sealed shoulders. It is suitable for aircraft up to Code C standard.

Taxiway D is 15 m wide with an asphalt surface and 3 m wide shoulders. It is suitable for aircraft up to Code C standard.

GA aircraft using the 14/32 Runway must taxi via Taxiways B or D and A, and then along the 05/23 Runway, before taxying to either the 14 or 32 Runway ends.

2.3.3 RPT Apron

The existing RPT apron has a width of 60 m and a length of 68 m to the north and 112 m to the south of the main terminal building.

Currently there are two primary bays marked on the apron, Bay 1 can accommodate B737 or SF340 aircraft, and Bay 2 is for SF340 aircraft. Secondary parking positions are designated for F50 aircraft.

All bays are based on power-in/power-out arrangements.

2.3.4 General Aviation Apron

The General Aviation Apron comprises of two precincts. The main General Aviation (GA) apron is situated to the east of the terminal. It is of wartime origin, and varies in condition throughout the area. The whole GA apron area is weight restricted to aircraft below 5,700 kg, except for the abandoned 07/25 Runway which is generally utilised by visiting aircraft.

On the western end of the GA apron, a number of aircraft parking positions are available, and are used mainly by itinerant aircraft. Most resident aircraft are parked in steel clad, steel framed hangars that have been constructed to the east of the GA apron area. These facilities also house a number of local aviation and non-aviation businesses at the airport.

The other General Aviation apron area is on the western side of the passenger terminal building and is dedicated to the Royal Flying Doctor Service.

2.4 Terminal Area

2.4.1 Terminal Building

The terminal building was constructed in 1993/1994. It has a lightweight suspended roof, with glass panel walls on the northern and southern sides. The building contains a small café on the northern side, and toilets on the southern side. Directly in the centre and across the rear of the terminal are four check-in counters and offices currently operated by Regional Express (Rex) Airlines, with an external baggage make-up area. All out bound bags are manually handled and loaded onto baggage trolleys.

There are no passenger or baggage security facilities (i.e. magnetometer and/or X-ray equipment) in the terminal. All passengers departing Broken Hill are considered as non sterile passengers (ie not security screened) and must be screened on arrival at Adelaide and Sydney Airports prior to entering the sterile departure areas.

The baggage reclaim area is located at the southern end of the passenger terminal and passengers collect their baggage directly from the baggage trolleys. The baggage trolleys are man handled into position by the airline ground staff.

The terminal currently has three small hire car check-in desks, operated by Thrifty, Hertz and Avis, and there is a fourth desk which is currently vacant.

One of the main features of the terminal is the gardens and landscaping in the external public viewing area at the front of the building, and also at the rear of the building and in the car park.

2.4.2 Roads and Car Parks

The airport is approximately 3 km from the city. Public access to the airport terminal is via Bonanza Road and the Airport Road. These roads are not lit.

The access road is owned and maintained by the Broken Hill City Council.

The entry road leads to connections providing entry to the terminal building, car park, Aero Club, hangars and airport industries. The roadway in front of the terminal building allows loading/unloading for passengers, taxi pick-ups and drop-offs.

The general car park at the terminal has approximately 80 parking spaces.

Parking may be short term for people farewelling or collecting passengers, or medium term for those passengers who leave their vehicles while on a trip.

The main (80 space) short to long term unsecured car park is located to the west of the main terminal, is always full and may need to expand. Car rental vehicles are parked within this facility.

Other roads serving businesses in the GA area are mainly bitumen sealed, but there are no sealed car park areas servicing these businesses.

2.4.3 Engineering Services

Broken Hill Airport is serviced by water, sewerage (not reticulated), electricity and telecommunications reticulated from the city supply.

2.5 Support Facilities

2.5.1 Aircraft Fuelling

Aircraft fuelling at the airport is currently provided by both Mobil and BP. Mobil operates from a compound located to the west of the Royal Flying Doctor Service facility, and BP operates from the main GA area.

RPT fuel (Jet A1) is provided by BP, and the current capacity held on site is 52,000 L. BP is currently in discussions with GA operators for the supply of AVGAS.

GA fuel (AVGAS) is currently provided by Mobil. Along with RPT Jet A1, this is mainly supplied exclusively to RFDS. Current capacity held at the airport is 64,000 L of AVGAS and 112,000 L of Jet A1.

2.5.2 Airline Catering

There is no airline catering provided at Broken Hill Airport. Catering is carried on board the aircraft from point of origin.

2.5.3 Air Freight

Limited freight is carried in the baggage compartment of SF340 aircraft operating the RPT services. Additional freight is brought in on freight/courier aircraft as required. The air freight is handled by Australian Air Express.

2.5.4 Aircraft Maintenance

There are currently no facilities to service aircraft operating RPT services at Broken Hill.
Aircraft maintenance for the domestic carrier Rex Airlines is performed in Adelaide and/or Sydney.

The Royal Flying Doctor Services (RFDS) undertakes it own aircraft maintenance within its own dedicated facilities.

General Aviation maintenance services to the aviation businesses and light aircraft operators are located in a number of hangar facilities adjacent to the main terminal.

2.5.5 Airport Maintenance

Maintenance of the airport facilities at Broken Hill Airport is generally performed by the Broken Hill City Council. The maintenance compound is situated off the main entry road and consists of a fenced compound with a number of old buildings and stored equipment.

General maintenance at the airport includes grass mowing, landscaping, apron, taxiway and runway pavement repairs, re-painting pavement markings, electrical power and lighting facilities maintenance, road maintenance, building maintenance and fencing.

Maintenance of the terminal is the responsibility of the kiosk lease.

2.5.6 Aero Club

The Aero Club of Broken Hill is located on the eastern side of the main entry road to the terminal and car park.

2.6 Operational Facilities

2.6.1 Control Tower/Air Traffic Control

There is no air traffic control tower provided at the airport due to the low number of aircraft movements. Aircraft separation is provided by the pilots talking to each other through the Common Traffic Advisory Frequency and the carriage of a radio is mandatory CTAF(R). The CTAF(R) boundary is at 10 nm radius from the Aerodrome Reference Point.

The airport is equipped with an Aerodrome Frequency Response Unit (AFRU) which provides an automatic response when pilots or ground staff transmits on the CTAF frequency (126.7).

When a radio transmission of two seconds duration or more is made on the aerodrome frequency, the AFRU automatically responds.

2.6.2 Navigational and Landing Aids

Navigational aids at Broken Hill Airport include:

- Non-Directional Beacon (NDB);
- VHF Omni - Directional Radio Range (VOR);
- Distance Measuring Equipment (DME); and
- Remote Receiver.

Landing Aids and Airport Lighting includes the following:

- Runway edge lighting (low intensity);
- Runway threshold lighting;
- Runway end lighting;
- Holding point lights;
- Taxiway centreline lighting;
- Apron floodlighting;
- Illuminated Wind Direction Indicator (IWDI) located adjacent to the intersection of Taxiways A and B;
- Wind Direction Indicator (unlit) near the intersection of the 05/23 and 14/32 Runways;
- Pilot Activated Lighting (PAL);
- AT-Visual Approach Slope Indicator Systems (AT-VASIS) (on left side of RWYs 05 and 23); and
- Painted Runway Markings.

2.6.3 Rescue and Fire Fighting Services

The Broken Hill City Council, as the airport owner, is responsible for establishing emergency procedures for the airport.

The procedures are detailed in the Broken Hill Airport Manual.

The emergency procedures are coordinated by the Broken Hill Police, with Rescue and Fire Fighting Services (RFFS) provided by the Broken Hill base of the New South Wales Fire and Rescue Service. There is no RFFS based at Broken Hill Airport.

2.7 Commercial Development

Commercial activities are classified as either aeronautical or non aeronautical. Aeronautical commercial actives are those activities that derive their income directly from aeronautical revenue. Non aeronautical commercial activities derive their income from non aeronautical revenue (e.g. warehouse or distribution store) or revenue derived indirectly fromaeronautical activities (e.g. retail outlets within the terminal).

Currently non-aeronautical commercial activities at the airport are not highly developed.

Within the passenger terminal up to three car rental firms have desks with direct telephone links to their Broken Hill city offices. The desks are serviced only during the busy scheduled airline services.

Also, within the passenger terminal is a kiosk/cafe providing snacks and refreshments to passengers, meeters/greeters and airport employees.

The following non aeronautical businesses and services are located in the main terminal building:

- Airport kiosk;
- ER & BD Morton – Barrier Car Rental Trading as Thrifty Car Rental;
- W.T.H. Pty Ltd – Avis Australia Car Rental; and
- AE & AI Sweet Pty Limited – Hertz Car Rental.

The following aviation businesses and services are located in the main GA area:

- Broken Hill Aviation Pty Ltd/Wettenhall Air Services;
- Broken Hill Aero Club;
- Flying Patrol Ministry;

- Barrier Air Taxi Services – Corner Country Air Services;
- Airservices Australia; and
- Consolidated Plant and Quarry (CPQ).

The Royal Flying Doctor Services are located on the western side of the passenger terminal building.

Other businesses/facilities located within the main GA area include:
- Broken Hill City Council Airport Maintenance Compound;
- Mobil Fuel Depot operated by Kamachlo Pty Ltd;
- BP Australia Ltd;
- Phillip John Cvirn – Flight training school and storage of aircraft; and
- Silver City Drilling (NSW) Pty Ltd – Storage of aircraft and ancillary purposes.

A number of community facilities are supported at the airport, namely:
- John Curtis & Sons Pty Ltd – Cremator;
- Mr GS Wellings – Garage; and
- Mr J Gati – Garage.

3. Planning and Development Legislative Framework

3.1 Agency Roles and Responsibilities

3.1.1 Commonwealth Government

The Commonwealth Government is responsible for implementing the standards and recommended practices adopted by the International Civil Aviation Organisation (ICAO). This responsibility is primarily delegated to CASA and Airservices Australia, through the Commonwealth Department of Transport and Regional Services. The Commonwealth also maintains the Australian Transport Safety Bureau's investigation of aircraft accidents and incidents.

Airservices Australia (ASA)

Airservices Australia has responsibility under the *Air Services Act 1995* as delegated from the *Civil Aviation Act 1988*, to manage airspace and air traffic, and to provide Australia's network of aviation facilities used in aircraft navigation, communication and surveillance. Interference with Airservices Australia's communications can invoke powers available under *the Australian Communications Authority Act 1997* and its regulations. Local governments are encouraged to seek advice from Airservices Australia on any development that has the potential to impact an aviation facility's sensitive area of technical accuracy.

Airservices Australia provides endorsement of the technical accuracy of ANEF charts for Broken Hill Airport and also controls the Broken Hill Airport navigation facilities, namely the Non-Directional Beacon (NDB) and the satellite ground station.

Civil Aviation Safety Authority (CASA)

CASA has responsibility under the *Civil Aviation Act 1988* and *Civil Aviation Regulations 1988* for the safety regulation of civil aviation in Australia. Amongst other things, CASA conducts surveillance to ensure airport and aircraft operators meet their responsibilities under Civil Aviation legislation. In the interest of aviation safety, CASA has powers under Commonwealth legislation to require the removal of a building or other structure that penetrates operational airspace, to require such obstacles to be lit, and/or to curtail aircraft operations.

CASA also has the legislative power to certify aerodromes. The certification is primarily safety related and for aerodromes having RPT services operated by aircraft with a capacity of 30 persons or more. Broken Hill Airport is currently certified.

Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government

The Department has responsibility under the Civil Aviation policy for security and air safety investigation. The *Aviation Transport Security Act 2004* has been enacted to provide for a wider range of aviation industry participants to develop and put in place security programs including:

- All operators of RPT services;
- Operators of charter aircraft, private or corporate jets;
- Operators of freight aircraft; and
- Airports that service these aircraft (Broken Hill Airport falls into this category.)

In addition, the Department has an overriding responsibility for the development of policy settings and regulatory arrangements for environmental matters such as aircraft noise, aircraft engine emissions and fuel spillage from aircraft. The Department's role also includes regulation, under the *Airports Act 1996*, of the privatised Commonwealth airports, to ensure they are operated in a safe, efficient and environmentally sustainable manner.

3.1.2 NSW State Government

NSW Ministry of Transport

The Australian Constitution gives state and territory governments power over regional aviation as it is largely an issue of intra-state trade. In New South Wales, licensing of intra-state aviation services is administered by the Ministry of Transport.

The Ministry of Transport governs and regulates regional air transport routes from Broken Hill Airport under the *Air Transport Act 1964*.

NSW Department of Planning

The NSW land use planning framework is set by the Environmental Planning and Assessment Act 1979 (EP&A Act) and the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation). Under the EP&A Act, Parts 3 to 5 regulates development and land use planning in NSW. The NSW Department of Planning implements the relevant Acts and Regulations.

The NSW Department of Planning is also responsible for any state and regional development policy direction within NSW, including Regional Environmental Plans and State Environmental Planning Policies.

Broken Hill Local Environmental Plan 1996 (LEP) is applicable to the site. The NSW Department of Planning is responsible for reviewing local environmental plans. It may, depending on the extent of development proposed on the airport site, also be the approving authority for any environmental assessment or review of environmental factors.

Other NSW Government Departments

There are a number of other New South Wales Government agencies including the Department of Environment and Climate Change, the Department of Natural Resources, and the Department of State and Regional Development that potentially could be involved in airport planning and development issues with respect to environmental controls and regulations.

3.1.3 Local Government

Broken Hill City Council

The role of Broken Hill City Council as owner and operator of Broken Hill Airport is to manage, maintain and improve the airport in accordance with operational airspace, aviation facility requirements, aviation noise standards and aviation security requirements. The Council must comply with New South Wales Government legislation in the first instance, and also with Commonwealth legislation in regulatory areas where State legislation does not exist.

Broken Hill City Council will ensure that legislative requirements are appropriately reflected in their new Local Environmental Plan that will be based on the standard LEP template.

Mandatory planning documents that must be prepared by the airport owner include Australian Noise Exposure Forecasts (ANEF's), endorsed by the relevant Commonwealth agency (Airservices Australia) and an Obstacle Limitation Surface (OLS) for the protection of airspace off airport.

3.2 Legislative Framework

The legislative and regulatory requirements for airports are covered by a wide range of Federal and State Government legislation. **Table 3.1** identifies the major legislative and regulatory guidelines applicable to the further development of Broken Hill Airport.

Table 3.1 Significant Legislation or Guidelines

Commonwealth Government	Comments
Aviation Transport Security Act 2004 Aviation Transport Security regulations 2005	Prescribed minimum requirements for airport security, air operator security, access control, equipment and procedures.
Civil Aviation Act 1988 Civil Aviation Regulations 1988 Civil Aviation Safety Regulations 1998 Civil Aviation Orders	Provides the legislative basis for air safety and the network of aviation facilities.
Air Services Act 1995	Delegates responsibilities to Airservices Australia to manage airspace and air traffic and to provide for Australia's network of aviation facilities used in aircraft navigation and communication.
Environment Protection and Biodiversity Conservation Act 1999	Federal Legislation for the assessment of projects where impacts on matters of environmental significance may occur. eg Listed threatened species and communities, Listed migratory species, Ramsar wetlands of international importance, The Commonwealth marine environment, World Heritage properties, National Heritage places, Nuclear actions
National Aviation Policy Green Paper, Flight Path to the Future, December 2008	This document is aimed at assisting with the creation of a national aviation industry strategic plan. The outcomes and responses to this paper will lead to the development of the Aviation White paper which is due for release in late 2009.
NSW Government	
Environmental Planning and Assessment Act 1979	The overarching statutory planning document for the planning assessment and approval process within all of NSW
Protection of the Environment Operations Act 1997	Protection of the environment and pollution control, largely noise, air and water.
Native Vegetation Act 2003	This act provides for the protection and management of native vegetation within the state.
Contaminated Land Management Act 1997	This act establishes a process for investigating and (where appropriate) remediating land areas where contamination presents a significant risk of harm to human health or some other aspect of the environment.
Heritage Act 1977	Protection and management of non-indigenous heritage sites and items.
National Parks and Wildlife Act 1974	Protection and management of national parks and Indigenous heritage sites and items.
Native Vegetation Act 2003	This act promotes the regional management of native vegetation and discourages broad scale clearing.
Rural Fires Act 1997	This act governs the prevention, mitigation and suppression of bush and other fires
Water Management Act 2000	The objects of this Act are to provide for the sustainable and integrated management of the water sources of the State.
State Environmental Planning Policies (SEPPs)	State policies which establish principles for environmental protection and management.
Broken Hill City Council	
Broken Hill Local Environmental Plan 1996	Governs all development within the Broken Hill local government area (this is currently under review).
City of Broken Hill Development Control Plan No. 2 Commercial Development	Applies to all land within the local government area and provides guidelines for commercial development in Broken Hill.
Broken Hill Development Control Plan No. 9 Exempt and Complying Development	Applies to all land within the Council local government area and advises when development can be carried out without prior approval from Council or can be undertaken by an accredited certifier.

3.3 Consistency with NSW Statutory Planning Framework

3.3.1 Environmental Planning and Assessment Act 1979

The objectives of this Airport Master Plan are consistent with the objects of the EP&A Act in that it assists to promote and co-ordinate the orderly and economic use and development of land. Potential environmental impacts have been considered during the master planning process.

3.3.2 State Environmental Planning Policies

State Environmental Planning Policies (SEPPs) are prepared under Part 3 of the EP&A Act and deal with issues significant to NSW. These are statutory environmental planning instruments that require consideration in the development assessment and environmental assessment processes.

The following SEPPs may be applicable to future development at the site.

No. 1 – Development Standards	A comprehensive development assessment process will apply to future development.
No. 4 – Development Without Consent and Miscellaneous Exempt and Complying Development	As above
No. 22 – Shops and Commercial Premises	Applies to change of use of commercial premises
No. 33 – Hazardous and Offensive Development	Any development of a hazardous or offensive nature requires development consent
No. 55 – Remediation of Land	The aims and objectives of SEPP 55 will be taken into consideration.
No. 64 – Advertising and Signage	Consistent with the aims of this SEPP, issues of road safety, amenity, character and finish will be considered in the assessment of any future development application.
Infrastructure 2007	The Master Plan is consistent with the provisions of Infrastructure SEPP in that the Master Plan requires a robust environmental assessment in requiring consent for all works undertaken on the airport site.
Temporary Structures and Places of Public Entertainment 2007	The Temporary Structures and Places of Public Entertainment SEPP will be taken into account where it is applicable in the development assessment process.

3.3.3 Regional Environmental Plans

Regional Environmental Plans (REPs) are prepared under Part 3 of the EP&A Act and provide the framework for comprehensive planning by local government. REPs deal with various issues including urban growth and commercial centres.

There are no Regional Environmental Plans or other regional planning strategies that directly relate to the airport site.

3.3.4 Section 117 Ministerial Directions

Under Section 117(2) of the EP&A Act, the NSW Minister for Planning is authorised to direct a public authority, a local council or an environmental planning instrument to follow the Local Planning Directions issued by the Minister. These directions generally apply to all local councils unless a direction is area specific.

The current Local Planning Directions, issued on 19 July 2007, have been considered for the purposes of this Master Plan. The following s117 Ministerial Directions are relevant:

- Direction No. 1 Employment and Resources
- Direction No. 2 Environment and Heritage
- Direction No. 3 Housing, Infrastructure and Urban Development
- Direction No. 6 Local Plan Making

The Master Plan is considered to be consistent with the objectives of the above directions in that it:

- Encourages employment growth in a suitable location and in a zone that is designated for urban functions (Direction 1.1).
- Considers the protection and conservation of environmentally sensitive areas (Direction 2.1).
- Supports the increased use of existing transport infrastructure and increases the choice of available transport (Direction 3.4).
- Ensures appropriate obstacle clearances areas are adhered to and ensures the effective and safe operation of the Airport by appropriate on-site zoning and land use (Direction 3.5).
- Does not include provisions that require the concurrence, consultation or referral of development applications and does not include restrictive development controls or inhibitive controls (Direction 6.1).

Given the points above, the Master Plan has given appropriate consideration to the current s117 Directions.

3.3.5 Standard Instrument – Local Environmental Plan

The NSW Minister for Planning announced the introduction of a Standard Instrument – Principal Local Environmental Plan (LEP Template) for all local government areas within NSW on 21 September 2005. Broken Hill City Council advised that with regards to potential future zoning amendments for the area, changes will be made. However, the extent of these changes is currently unknown. It is unlikely that the changes will have a significant impact on the implementation of this Master Plan. It is recommended that any consideration of rezoning is undertaken in conjunction with this Master Plan.

3.3.6 Broken Hill Local Environmental Plan 1996

Local Environmental Plans (LEPs) are prepared under Part 3 of the EP&A Act and provide the local planning provisions and controls for the local government area. As noted above, the airport site is located in the Broken Hill Local Government Area. The Master Plan was reviewed against the LEP to assess planning consistency.

The Master Plan is consistent with the general aims of the LEP in that it provides for the efficient and effective delivery of services and will subsequently facilitate the future orderly development of tourist activities. Furthermore, any development of the airport or increase in its operations will provide for employment opportunities both in the construction and operational phases.

The Master Plan is consistent with the objectives of the City 2 (c) Zone which applies to the site. It will promote development in Broken Hill in a manner that is compatible with its urban function.

As noted further below in this document, there is some vegetation surrounding the airport's cleared area. This Airport Master Plan recognises the issue of vegetation removal and it must be carefully considered in the development of the site. Where applicable, an environmental assessment of proposed development should be provided.

With regards to heritage, no built heritage or archaeological sites have been identified as being on or within the immediate vicinity of the airport.

3.3.7 Draft Broken Hill Local Profile and Issues Paper 2009

This paper covers a variety of issues relating to the wider Broken Hill region. Specific to the airport, the paper notes that air travel demand is dependent on a variety of factors such as mining operations, the location of administrative functions at a state level and tourism. Tourism is an area for expansion as currently the majority of tourists drive to Broken Hill.

3.3.8 Development Control Plans

Development Control Plans are not statutory documents but will be considered by Council in the assessment of relevant proposed development. Council's Development Control Plans provide controls for commercial development and specify exempt and complying development.

3.4 Approvals

The Environmental Planning and Assessment Act (EP&A) 1979 is the most important piece of legislation relating to development at the Broken Hill Airport site. For any development on the airport site, there are two planning approval process that it could require:

- For development relating to the terminal building, a planning approval would need to be sought under Part 4 of the EP&A Act.
- For all other development relating to the apron, runway, taxiways and any facilities relating to the maintenance and repair of aircraft, a planning approval would need to be sought under Part 5 of the EP&A Act.

No development would be subject to Part 3A as the site is not included in the listing of classes of development or specified sites in the Major Project SEPP to which Part 3A applies.

4. Forecast Demand

4.1 Historical Aviation Traffic Data

4.1.1 Australian Domestic Aviation Traffic

If Broken Hill Airport is expanded, any growth in passenger numbers will be linked to the growth of Australian aviation as a whole, and specific local factors caused by the increased demand that would flow from the introduction of low cost airline services.

Australia's domestic airline industry has experienced strong sustained growth in passenger numbers over the last ten years at around 6.8% growth per annum. There was a sharp short term decrease in passenger numbers in September 2001, due to the collapse of Ansett and the effects of the September 11 plane hijackings. Since this time, growth in passenger numbers has more than recovered helped along by the low-cost domestic airlines Virgin Blue, Jetstar and the new entrant Tiger Airways. The increase since 2001/02 has been around 9.0% compound growth per annum despite jet fuel prices more than doubling over this period and thereby adding cost pressures to domestic airfares.

The figures in **Table 4.1** show that total aircraft departures have actually decreased over the decade. Growth in passenger numbers has come from an increase in the average seat capacity on each flight and also an increase in the proportion of seats filled by passengers (i.e. load factors).

Table 4.1 Australian Domestic Aviation Traffic 1997/98 to 2008/09

Financial Year	Aircraft Departures (thousands)	Passengers On Board (millions)	Available Seats (millions)	Revenue Passenger Kilometres (billions)	Available Seat-kms (billions)	Load Factor (%)
1997/98	581.9	28.30	40.06	28.32	38.24	74.1
1998/99	589.7	28.73	40.38	28.99	38.75	74.8
1999/00	589.6	30.33	41.59	30.77	40.30	76.3
2000/01	620.3	33.07	45.82	33.70	44.65	75.5
2001/02	488.7	29.60	40.14	31.15	40.50	76.9
2002/03	480.0	31.27	41.82	33.99	43.78	77.6
2003/04	496.2	35.48	46.04	39.21	49.70	78.9
2004/05	539.1	39.50	52.30	43.82	56.39	77.7
2005/06	531.4	41.82	55.33	46.69	60.12	77.7
2007/08	530.6	46.47	59.65	52.71	66.18	79.7
2008/09	555.1	49.98	65.34	57.13	72.83	78.4
Total	**6587.1**	**422.46**	**569.04**	**454.29**	**589.80**	**79.1**

Source: Avline Issue No.10, September 2008

4.1.2 Broken Hill Aviation Traffic

Growth in passenger numbers has averaged 5.4% per annum over the past ten years, slightly below the Australian average of 6.8% per annum. **Table 4.2** shows that revenue passengers have generally increased by between 10% and 20% per annum at Broken Hill between 2002-03 and 2007-08, however this was heavily influenced by the previous three years of decline. The 2001/02 year represents the year that Ansett/Kendall airlines collapsed.

Table 4.2 : Broken Hill Airport Revenue Passengers and Aircraft Movements 1997/98 to 2007/08

Financial Year	Broken Hill				Australia	
	Revenue Passengers		Aircraft Movements		Revenue Passengers	
	Total	Growth	Total	Growth	Total	Growth
1997/98	37,861		2,634		51,222,990	
1998/99	40,460	6.9%	2,959	12.3%	56,291,326	9.9%
1999/00	39,215	-3.1%	3,204	8.3%	59,333,790	5.4%
2000/01	36,065	-8.0%	2,614	-18.4%	64,801,316	9.2%
2001/02	28,287	-21.6%	1,998	-23.6%	58,327,094	-10.0%
2002/03	29,168	3.1%	2,215	10.9%	61,643,032	5.7%
2003/04	34,457	18.1%	2,313	4.4%	70,149,752	13.8%
2004/05	39,281	14.0%	2,412	4.3%	78,172,676	11.4%
2005/06	43,631	11.1%	2,441	1.2%	82,900,548	6.0%
2006/07	48,405	10.9%	2,453	0.5%	89,945,110	8.5%
2007/08	59,561	23.0%	2,841	15.8%	96,856,094	7.7%

Source: Bureau of Infrastructure, Transport and Regional Economics (BITRE) Airport Traffic Data

Table 4.3 shows increasing revenue passengers per aircraft over the last four years associated with increasing load factors on SF340 aircraft operating on the Broken Hill route.

Table 4.3 Broken Hill Airport Passengers per Aircraft Movement 1997/98 to 2007/08

Financial Year	Passenger Movements	Aircraft Movements	Average Pax per Aircraft
1997/98	37,861	2,634	14.4
1998/99	40,460	2,959	13.7
1999/00	39,215	3,204	12.2
2000/01	36,065	2,614	13.8
2001/02	28,287	1,998	14.2
2002/03	29,168	2,215	13.2
2003/04	34,457	2,313	14.9
2004/05	39,281	2,412	16.3
2005/06	43,631	2,441	17.8
2006/07	48,405	2,453	19.9
2007/08	59,561	2,841	21.0

Source: BITRE Airport Traffic Data

4.1.3 Comparing Broken Hill Airport to Other Airports

Broken Hill is characterised by being a low populated area that is remote from capital cities (Sydney, Melbourne and Adelaide). Arguably the most similar location is Mount Isa Airport which operates in a very similar social, economic and physical environment to Broken Hill.

Details on Mildura Airport have also been included for comparison purposes. Although the population of the Mildura region is considerably greater than the Broken Hill region, it has been included as a yardstick because Low Cost Carrier airline operations are just commencing. Comparison between these two cities and air passenger figures could help predict the level of growth that Broken Hill Airport could expect if it attracts services from low-cost domestic airlines.

Mount Isa Airport

Mount Isa has a resident population of 21,043 (as of January 2007) compared with Broken Hill which has 20,274 residents.

Qantas currently operates B737-800 aircraft on the Brisbane-Mount Isa route with up to 10 services per week, and MacAir provides some services from Townsville (currently in decline).

The substantial difference in passenger movements is due to the larger FIFO work force at Mt Isa, the larger distances to capital cities, and the route structures. Mt Isa has major connections only to Brisbane and Townsville, and these destinations are considerably distances away. Broken Hill has current routes to Sydney and Adelaide which are closer and potential links to Melbourne and Mildura.

Table 4.4 Mount Isa Airport Revenue Passengers and Aircraft Movements 1997/98 to 2007/08

Financial Year	Mount Isa				Broken Hill	
	Revenue Passengers		Aircraft Movements		Revenue Passengers	
	Total	Growth	Total	Growth	Total	Growth
1997/98	115,713		3,996		37,861	
1998/99	139,944	20.9%	5,611	40.4%	40,460	6.9%
1999/00	141,513	1.1%	5,635	0.4%	39,215	-3.1%
2000/01	134,589	-4.9%	5,227	-7.2%	36,065	-8.0%
2001/02	89,433	-33.6%	3,548	-5.0%	28,287	-21.6%
2002/03	88,793	-0.7%	3,736	5.3%	29,168	3.1%
2003/04	99,205	11.7%	3,596	-3.7%	34,457	18.1%
2004/05	111,303	12.2%	3,541	-1.5%	39,281	14.0%
2005/06	132,475	19.0%	3,769	6.4%	43,631	11.1%
2006/07	155,572	17.4%	4,185	11.0%	48,405	10.9%
2007/08	190,273	22.3%	4,848	15.8%	59,561	23.0%

Source: BITRE Airport Traffic Data

Table 4.5 Mount Isa Airport Passengers per Aircraft Movement 1997/98 to 2007/08

Financial Year	Passenger Movements	Aircraft Movements	Average Pax per Aircraft
1997/98	115,713	3,996	29.0
1998/99	139,944	5,611	25.0
1999/00	141,513	5,635	25.1
2000/01	134,589	5,227	25.7
2001/02	89,433	3,548	25.2
2002/03	88,793	3,736	23.8
2003/04	99,205	3,596	27.6
2004/05	111,303	3,541	31.4
2005/06	132,475	3,769	35.1
2006/07	155,572	4,185	37.2
2007/08	190,273	4,848	39.2

Mildura Airport

Mildura has a resident population of about 60,000 compared with Broken Hill which has 20,274 residents.

Qantaslink currently operates DHC8-300 aircraft on the Melbourne–Mildura route with up to 24 services per week. Rex currently operates SF340 aircraft also on the Melbourne–Mildura route with up to 19 services per week. Recently Virgin Blue commenced operations on the Mildura-Melbourne route using EMB170 aircraft on a once daily service.

Table 4.6 Mildura Airport Revenue Passengers and Aircraft Movements 1997/98 to 2007/08

Financial Year	Mildura				Broken Hill	
	Revenue Passengers		Aircraft Movements		Revenue Passengers	
	Total	Growth	Total	Growth	Total	Growth
1997/98	108,969		6,433		37,861	
1998/99	113,619	4.3%	7,249	12.7%	40,460	6.9%
1999/00	122,563	7.9%	7,347	1.4%	39,215	-3.1%
2000/01	115,624	-5.7%	6,345	-13.6%	36,065	-8.0%
2001/02	94,654	-18.1%	5,481	-13.6%	28,287	-21.6%
2002/03	103,154	9.0%	6,355	15.9%	29,168	3.1%
2003/04	125,641	21.8%	6,522	2.6%	34,457	18.1%
2004/05	148,368	18.1%	6,769	3.8%	39,281	14.0%
2005/06	154,654	4.2%	7,348	8.6%	43,631	11.1%
2006/07	167,983	8.6%	7,477	1.8%	48,405	10.9%
2007/08	170,146	1.3%	6,921	-7.4%	59,561	23.0%

Source: BITRE Airport Traffic Data

Table 4.7 Mildura Airport Passengers per Aircraft Movement 1997/98 to 2007/08

Financial Year	Passenger Movements	Aircraft Movements	Average Pax per Aircraft
1997/98	108,969	6,433	16.9
1998/99	113,619	7,249	15.7
1999/00	122,563	7,347	16.7
2000/01	115,624	6,345	18.2
2001/02	94,654	5,481	17.3
2002/03	103,154	6,355	16.2
2003/04	125,641	6,522	19.3
2004/05	148,368	6,769	21.9
2005/06	154,654	7,348	21.0
2006/07	167,983	7,477	22.5
2007/08	170,146	6,921	24.6

4.1.4 Revenue Passenger Trends

Table 4.8 compares the growth in revenue passengers at Broken Hill against Mount Isa, Mildura, Albany, Newcastle, Coffs Harbour, Hervey Bay and Australia trends. The table provides data for the last decade (i.e. 1997/98 to 2007/08) and also for 2001/02 to 2007/08.

The period between 2001/02 and 2002/03 was characterised by the slump in revenue passengers as result of the Ansett collapse, the September 11 aftermath and the malaise of the Australian economy at the time. Post 2002/03 has seen a significant growth in revenue passengers from the introduction of low cost jet services to many regional centres by Virgin Blue and Jetstar and the provision of additional capacity by Qantaslink upgrading regional service routes to DHC8-300 and Q400 services.

The effect of the introduction of low-cost carrier jet aircraft operations is clearly evident in the figures for Newcastle and Hervey Bay airports.

Table 4.8 Revenue Passengers Average Annual Growth

Revenue Passengers	1997/98 to 2007/08	2001/02 to 2007/08
Broken Hill	5.4%	13.3%
Mount Isa	6.5%	13.7%
Mildura	5.1%	10.5%
Albany	6.5%	10.1%
Newcastle[1]	22.1%	35.9%
Coffs Harbour	8.1%	18.0%
Hervey Bay[2]	33.2%	59.8%
Australia (Domestic Plus Regional)	6.0%	8.9%
Australia (Domestic)	6.4%	9.4%
Australia (Regional)	3.4%	5.3%

Source: BITRE Airport Traffic Data
1 Airports is heavily used by the Department of Defence.
2 High tourist area with direct low cost carriers from the southern states

While Broken Hill is marginally below the Australian average annual growth rate for the period 1997/98 to 2007/08, it is significantly above the Australian average over the period 2001/02 to 2007/08. The growth in passengers over the last 6 years exceeds 13% and is similar to growths at other regional airports not experiencing Low-Cost Carrier operations (Mount Isa, Mildura, Albany, Coffs Harbour)

4.1.5 Revenue Passengers to Population Ratio

Any increase in Broken Hill's air passenger traffic will depend on the airfares and potential introduction and availability of low-cost domestic airlines servicing it.

The dramatic one-year increase seen at Hervey Bay in 2005/06 (albeit off a low base level) was not seen in Newcastle or Coffs Harbour when they first received expanded airline services. These latter two cities experienced smoother ramping-up of traffic from low cost airlines, which still resulted in substantial passenger growth.

The ratio of revenue passengers to population is provided in **Table 4.9**. It is noted that the geographic catchment for an airport can be broader than the locality/region in which the airport is located.

Whilst the populations of Broken Hill and Mount Isa are comparable, the Annual Revenue Passengers per Head of Population differs significantly. This is considered to be due to the large fly-in/fly-out workforce and businesses that service the mines in Mount Isa.

It is also noted that the ratios for Mildura and Broken Hill are similar, despite the resident population at Mildura being about two and half times that of Broken Hill. Both cities attract relatively low numbers of tourists by air.

Without any significant increase in tourism or a change at the mines to adopt a fly-in/fly-out operations it is difficult to perceive that the passengers to population ratio will increase significantly at Broken Hill. In turn, it is unlikely that low-cost carriers operating larger aircraft will commence services until the revenue passengers increases significantly.

Table 4.9 : Annual Revenue Passengers per Head of Population 2007/08

Airport	Revenue Passengers	Population	Ratio
Broken Hill	59,561	20,074	3.0
Mount Isa	190,273	21,177	9.0
Mildura	170,146	52,576	3.2
Albany	57,401	33,545	1.7
Newcastle	1,065,972	493,466	1.9
Coffs Harbour	337,698	143,369	2.3
Hervey Bay	210,740	97,088	2.1

4.2 Current Aviation Traffic Data

Air passenger services in New South Wales and nationally continue to evolve as a result of airline deregulation, particularly the emergence of budget airlines such as Virgin Blue, Jetstar and Tiger over the past five years.

In the deregulated environment, the major airlines have developed route systems and assigned aircraft to those routes to better match the type of aircraft and frequency of service to meet passenger demand.

In Broken Hill and in other regions with low density markets, commercial air services have been provided by turbo-prop commuter type aircraft.

In terms of scheduled air services, Broken Hill is currently served solely by Rex using turbo-prop SF340 aircraft (36 seats). Currently Rex offers services between Broken Hill and Adelaide, Sydney and Dubbo in accordance with the schedules shown in **Table 4.10**.

Table 4.10 Broken Hill Airport – May 2009 Scheduled Rex Services

Service	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Total
Adelaide - Broken Hill	2	2	3	3	3	1	1	15
Broken Hill - Adelaide	2	2	3	3	3	1	1	15
Sydney - Broken Hill	2	2	2	2	2	1	2	13
Broken Hill - Sydney	2	2	2	2	2	2	1	13
Dubbo – Broken Hill	1	1	1	1	1	-	-	5
Broken Hill - Dubbo	1	1	1	1	1	-	-	5
TOTALS	10	10	12	12	12	5	5	66

On a weekly basis, Rex offers 15 services between Adelaide and Broken Hill (540 seats each way), 13 services between Sydney and Broken Hill (468 seats each way), and 5 services between Dubbo and Broken Hill (180 seats each way).

At 100% load factors this would constitute 123,552 passenger seats (61,776 incoming and 61,776 out-going passengers) at Broken Hill on an annual basis.

With current revenue passengers at 59,561, the average load factors are as low as 48%.

Clearly, the current schedules provide more than enough capacity for the current demand, and there is scope to increase significant growth in passenger traffic prior to the introduction of increased service frequencies or larger aircraft. At the current load factor average, this means that some services are operating at less than 48% load factor and there is a real possibility that some services may be cut on a temporary basis under the current pilot shortage and financial crisis being experienced (2008/2009 with no signs of slowing down) within Australia.

The existing airside and landside infrastructure, aside from terminal requirements, is adequate to cater for existing levels of passenger movements provided by Rex Airlines as sole RPT operator at Broken Hill Airport. However, security baggage screening facility requirements will be required if larger (50 passenger or more) aircraft were to be introduced.

4.3 Future Demand

Airport master planning is essentially driven by the demand that may reasonably be expected to occur over a 20-year planning horizon.

The level of airport demand involves the forecast of such aviation activity as:

- Scheduled air services traffic and passengers;
- General Aviation traffic;
- Air freight; and
- Aviation related industries.

The activity indicators in turn provide the basis for airside and landside infrastructure enhancements, financial, land use and environmental planning.

For this master planning process, a set of Low, Medium and High forecasts has been developed to guide airside and landside infrastructure planning. The events of the past few years highlights that the aviation sector, both nationally and internationally is volatile, and can be severely adversely affected by unexpected events such as the September 11 disaster, and the demise of Ansett and Flight West. Unexpected and unprecedented growth has resulted from the introduction of Low-Cost Carriers. Therefore the aviation sector is highly dynamic and airport planning must remain flexible to respond to changing needs and demands throughout the system.

4.3.1 Factors Influencing Demand

The level and growth dynamics of aircraft traffic at Broken Hill will be significantly influenced by the future pattern and characteristics of passenger traffic through the airport. In turn, the level and growth dynamics of passenger traffic will be influenced by:

- Regional population/employment growth;
- Local mining industry – Fly-in/Fly-out operations;
- Regional industrial, commercial and agricultural development trends;
- Growth of tourism travel into the region;
- General level of airfares compared with disposable income;
- Airline pricing and competition;
- Airline equipment types; and
- Traffic mix between business/leisure.

Other factors which will have some bearing on actual passenger traffic include:

- Seasonal conditions;
- Business fluctuations;
- Competition from other modes, mainly road and rail travel;
- Airline scheduling policies;
- Airport operating policies (eg curfews); and
- Specific event traffic.

4.3.2 Forecast Population Growth

The Broken Hill Local Government area covers 179 km^2 and has a population of 20,074 persons *(Source: Australian Bureau of Statistics (31 March 2008)*.

This represents a 30% decline since 1971 which is mainly related to the run down in the local mining industry. However, in recent years the population has stabilised somewhat and the rate of decline has slowed down as shown in **Table 4.11** (Source: ABS, 3218.0 Regional Population Growth, Australia). This is in comparison to NSW overall average growth rate of 0.8% in the same period.

Table 4.11 Broken Hill LGA Estimated Resident Population 2001-2007

Year	Estimated Resident Population	Growth
2001	21,098	
2002	20,864	-1.11%
2003	20,607	-1.23%
2004	20,343	-1.28%
2005	20,210	-0.65%
2006	20,139	-0.35%
2007	20,074	-0.32%

Source: Australian Bureau of Statistics (31 March 2008)

It is anticipated that the population will remain fairly stable over the next five years, with at worst, a small decline.

The NSW Government Department of Planning publication "NSW State and Regional Population Projections 2006-2036" indicates an expected decrease in the population of the north-west statistical division (which includes Broken Hill) of 12% within this period. The annual population growth rate is expected to decline from -0.24% in 2009/10 to -0.68% by 2035/36.

4.3.3 Forecast Employment Growth

September 2008 marked the beginning of a global financial crisis and credit crunch. The financial crisis is likely to have a substantial adverse effect on investment and prospects for the short term over the next two years have been assessed as grim. Economic conditions generally move in cycles and it is likely that the international and Australia economies will have a number of peaks and troughs over the 20 year forecasting period of this master plan.

With particular reference to the Broken Hill economy, metal prices are expected to continue to fall in the immediate short term due to diminished global demand. With commodity spot prices plunging, many mining projects have been postponed or cancelled. This impacts directly on mining economies such as that of Broken Hill. This trend is expected to continue with contracts due to be negotiated in April 2009 expected to settle substantially lower for the 2009-2010 financial year. Weakness in the Australian dollar exchange rate should alleviate some of the impact of falling commodity prices but revenue of mining firms is forecast to decrease and volumes are expected to come under pressure. The forecast for commodity prices is a downward trend until June 2010. With the markets expected to recover and credit controls to loosen in 2010-11, firms will be able to resume and catch up on projects which were postponed in previous years. Notwithstanding, the ramp-up of mining projects will be directly linked to the international demand for metals. As demand increases so will recovery of the mining sector and the prevailing economic environment.

Agribusiness and mining are the key constituents of the Broken Hill economy. Agribusiness is one of the industries driving the Far West NSW economy, accounting for approximately 11% of GDP and 10% of the workforce. The area has faced a number of adverse climatic conditions including drought. Employment in the industry is however predicted to remain quite constant. Predominantly, Broken Hill instead relies on mining, retail and the services sectors as its key economic activities. The Broken Hill City Council is attempting to foster diversification in promoting horticulture and tourism. If the mining sector continues to falter, these industries will become increasingly important to the regional economy.

Mining has played a central role in the Broken Hill economy for many years, accounting for 25% of Broken Hill's total economy. As such mining projects have a significant impact on the economic prosperity of the region. The size of the mining operations in and outside of Broken Hill have however been decreasing over the past 30 years which has resulted in population decline in the region. In more recent times, particularly between 2003 and 2006, the population stabilised and a number of mining projects materialised. A high level of demand in the mineral resources sector drove prospective and existing mining operations throughout the period, and the re-opening of some previous operations. The newer operations are expected to continue to operate until at least 2020. Mining companies operating in the Broken Hill include Perilya, CBH Resources, Bemax and Havilah.

Over the last two years however, the prices of lead and zinc in the global markets have fallen by 70%. Combined with a collapse in global demand for commodities in the December quarter of 2008, the low metal prices have undermined the success of many of the mines in the Broken Hill region. In August 2008, Perilya cut 440 jobs from its zinc mine in Broken Hill. This was followed on from the severe curtailment of CBH Resources which resulted in the loss of 500 jobs (including contractors) with the cessation of their mining operations in June 2008. Zinc prices predicted to remain depressed throughout 2009 and into 2010 as the global economy continue to sink through 2009; more job cuts in the mining industry are being anticipated. This is predicted to negatively impact both the employment levels and economic activity in the Broken Hill region. Though Reserve Bank of Australia (RBA) predicts the economy could improve in the second quarter of the 2009-2010 business years, the effects of the downturn are expected to be felt until the 2010-2011 financial year.

4.3.4 Forecast Business Growth

Despite the economic slowdown affecting the mining industry throughout Australia, there are multiple prospective projects that have been proposed by companies operating in the Broken Hill area. There are currently 11 mining projects planned or committed to for the region, though in light of the current economic downturn, some have been placed on hold. Demand is expected to recover and credit controls to soften in the 2010-11 business year, which should spark recovery and investment in mining projects. This assumes that there is a corresponding increase in the demand for Broken Hill metals. The expected revenue during construction of the proposed projects for the region totals $712 million and 905 jobs are expected to be created. In the operational phase, approximately 763 jobs are expected to be created and revenue of at least $405 million is expected. A summary of the current positions of mining developments/operations in the Broken Hill region is as follows:

Perilya

- Potosi exploration decline commenced January 2007
  - Placed on care and maintenance September 2008
  - Producing lower tonnage since September 2008 due to low metal prices
  - Remain operational at current levels for two to three years at current prices
- North Mine and North Mine Deeps developments
  - Placed on care and maintenance, September 2008
  - $125m and 125 jobs during construction
  - Further $86m and 140 jobs during operation

CBH Resources

- Rasp mine (Zinc, Lead and Silver)
  - Drilling in progress on remnant ore (40% complete)
  - Project placed on care and maintenance on 17 June 2008

Bemax

- The Snapper mine
  - Still in construction phase
  - $105m and 150 jobs expected during construction phase
- Broken Hill Mineral Separation Plant
  - Started production February 2006

Havilah

- Three copper and gold mines west of Broken Hill at Kalkaroo, Mutooroo and North Portia
- Kalkaroo Project: copper and gold
  - Feasibility study largely completed as of February 2009
  - $200m and 200 jobs during construction phase when and if it commences
  - Further $123m and 200 jobs during operations
- Mutooroo mine to be developed for sulphuric acid, copper, cobalt and iron ore
  - Placed on hold until the completion of Kalkaroo feasibility study
  - Expecting a ten year open pit mine life

Exco Resources/Polymetals Joint Venture

- White Dam
  - Located approximately 80 km west of Broken Hill
  - Final sign off expected in the first quarter of 2009, expect development of the project in the near term
  - Project represents a valuable opportunity for both parties in light of the current high gold prices

If Havilah's Kalkaroo and Mutooroo projects, as well as Exco Resources White Dam project go ahead in 2009 as is expected, the total monetary benefits of the construction phase are expected to be in the order of $237 million. These projects are expected to create approximately 310 construction jobs. Some workers will chose to reside in Broken Hill due to its proximity to the mines, and others may chose to fly in – fly out through Broken Hill Airport.

Although Perilya has reduced the production levels of its major developments in Broken Hill due to unfavourable economic circumstances, they will be able to remain operating at current levels for two to three years. Perilya is ready to increase production as soon as prices recover. Perilya operations will create 150 jobs during construction and a further 180 during operations. Furthermore, revenue from these projects is approximated at $150M during construction and a further $110M during operations.

Increased mining operations in the Broken Hill Region will result in further economic benefits multiplied throughout the Broken Hill economy stemming from housing investment/rentals, travel and increased retail sales.

The Far West Region Growth & Investment Strategy dated June 2007 and the *Broken Hill Airport Development Initiative*, dated January 2007, are key documents that provide further details on projected growth in the region.

4.3.5 Forecast Tourism Growth

Broken Hill is a historically significant town, and the region hosts an array of tourist attractions including the Living Desert Sanctuary, the Regional Art Gallery, native wildlife, wetlands and sand dunes. Despite this, the local tourism industry declined between 2003 and 2007 according to the tourist movement statistics. During this period the region has faced ongoing drought which has negatively impacted on the tourist industry.

The Broken Hill City Council has increased investment in the area in an attempt to stimulate growth, and tourism is forecast to grow by approximately 2% per annum in the coming years. As a result, tourism will be one of the key growth industries in the Far West region and will play an increasingly important role in the Broken Hill economy. Already 2008 saw significant increase in the number of domestic day-trip tourists in the region. Unfortunately as a consequence of the global economic turndown, tourism is expected to suffer in 2009 as consumers cut back on optional travel. As a result, numbers of domestic overnight and day-trip visitors may decline through 2009, but should improve again as consumer confidence is regained in the 2010-11 business year. **Table 4.12** shows the tourists movements from 2003-2004 to 2007-2008

Table 4.12 Tourist Movements through Far Western NSW, 2003-2008

Financial Year	Total Number of Tourists	Average Annual % Change
2003-2004	514,000	
2004-2005	429,000	-16.5
2005-2006	420,000	-2.1
2006-2007	418,000	-0.5
2007-2008	426,000	1.9

Over the past five years, with a strong national economy, tourists' movements have been between 420,000 and 515,000. It is expected that improving air services between Sydney and Broken Hill, Adelaide and Broken Hill and possibly new markets such as Melbourne to Broken Hill will improve the numbers of visitors to the region opening it up to visitors from around Australia as well as international travellers. The prevailing economic conditions will ultimately impact on the tourism market both in Broken Hill and nationally. Tourists' numbers would be expected to remain in the 420,000 – 515,000 range and/or even decline in the short term until favourable economic factors start to emerge.

4.3.6 Propensity for Travel

In forecasting the future growth of airfare levels, mitigation against historical patterns of aircraft growth needs to be taken into account in recognition of the general movement to reduce the real costs of air travel in Australia.

Studies of prospects for airfare levels throughout Australia and internationally have indicated a range of possibilities for airfare level changes up to the year 2010 (varying from annual increases of 1.5 to 2.0% per annum, little or no real change, to an annual decrease of 2.5% per cent per annum for some travel categories).

A moderate increase in real terms (that is, after inflation effects are removed), is not an unreasonable assumption for the purpose of this forecasting exercise.

It is acknowledged that airlines can stimulate the propensity for air travel during periods of historical low demand (off peak times) by significantly reducing airfares for such periods.

4.4 Feasibility of Low-Cost Carrier Services at Broken Hill Airport

Based on the forecast population, employment, business and tourism growth discussed above, it is clear that the introduction of any Low-Cost Carrier operations will be contingent upon a significant increase in tourism, since population, employment and business forecasts would not support additional traffic.

The Low Cost Carrier model is based on high load factors and low costs. The model has been very successful in high tourist areas where tourists would prefer to travel by air rather than spend days travelling by road to their holiday destination or on high density and high yield routes. The introduction of Virgin Blue to Coffs Harbour and Port Macquarie is a good example of this. Both ports were strongly supported by one carrier with frequent services. The introduction of a new carrier stimulated the market and increased passenger numbers.

Any increase in tourism numbers will create a market demand that could possibly be profitable for Low-Cost Carrier operations. It will therefore be in the interest of the Council to continually talk to Jetstar, Virgin Blue and Tiger Airlines to ascertain their interest in providing such services. Consideration could be given to entrepreneurial tourism innovations such as by providing "Red Centre" flights from Melbourne through Broken Hill to Alice Springs and Darwin.

Another opportunity for Low-Cost Carrier operations is to support mining personnel in Western Australia. New services have been provided to Newman and Karratha from the east coast in order to supply additional personnel on a fly-in/fly-out basis. A large percentage of workers in the Western Australia mining industries now reside in the eastern states. While the resources industry has been hit due to the Global Financial Crisis and has had seen some slow down in recent times, experienced mining personnel in Broken Hill may provide additional resources when the industry rebounds.

Council will need to be cognisant of being prepared for upgrading of the airport at short notice so that Low-Cost Carriers could operate if such opportunities arise.

4.5 Passenger Forecasts

4.5.1 Introduction

Revenue passenger forecasts for Broken Hill Airport will be primarily influenced by local factors namely population, the resources sector and other prospective economic activities such as tourism.

Passenger demand has surged over the past five years as a result of the strength of the resources sector and the buoyant national economy. Revenue passenger numbers have increased from 29,168 in 2002/03 to around 60,000 in 2008. Average growth over the same 5 year period has been around 15.4% per annum which is considered on the very high side. Prior to this sustained increase that commenced in 2002/03, passenger movements at Broken Hill oscillated from a high of 40,460 in 1998/99 to a low of 28,287 in 2001/02. This latter period coincided with the Ansett collapse, September 11 and depressed national and international economies.

The recent economic downturn since mid 2008 will have an adverse impact on passenger demand at Broken Hill Airport at least in the short term. The future buoyancy or otherwise of the resources sector in Broken Hill remains the key factor in the medium and long term. It has been assumed in the forecasting that the resource sector and the resulting workforce and population will be sustainable at Broken Hill over the next 20 years.

4.5.2 Forecast Passenger Movements

Passenger forecasting has been undertaken for Broken Hill Airport based on the best knowledge of the aviation market at this point in time. With the forecasting horizon stretching to 20 years, this factor creates a number of variables that cannot be controlled.

Forecasting methods used to project airport activity reflect the underlying causal relationships that drive aviation activity. Aviation activity levels result from the interaction of demand and supply factors. The demand for aviation is largely a function of demographic and economic activity. Supply factors that influence activity levels include cost, competition, and regulations.

Typically, passenger movements can usually be modelled as a function of variables such as real personal income and real yield (as a measure of fares). The number of commercial operations, in turn, is a function of passenger movements as well as operational factors (including average load factors and average seats per aircraft). Broken Hill Airport is different to the conventional airport given the predominance of resource sector passenger movements. Hence demand is primarily influenced by economic factors pertaining to the resources sector.

The forecasting method that has been adopted for Broken Hill Airport is an interval or range forecast. This method results in scenario forecasts, which may have Low, Medium and High forecasts, with a “most likely” level identified. When considering the appropriateness of a range forecast, forecasting should verify whether there are any extraordinary events possible in the future of the airport and the region it serves. These events can be negative or positive. A region highly dependent on one business such as the resources sector in the case of Broken Hill Airport has been reviewed with a view to possible expansion or recession or a neutral position with respect of that industry sector. Possible new and/or expanded air services are another reason to specify an alternative forecast scenario and ranges.

Passenger forecasts have been developed for Low, Medium and High scenarios on the basis the economic conditions will be sustainable in the medium and long terms. The other key assumptions that have been adopted for estimating passenger movement forecasts are as follows.

General assumptions for all scenarios

- Revenue passenger movements for 2007/08 have been used as the base year although it is acknowledged that this year is the culmination of five years of high growth;
- Resident population to remain around 20,000 in line with estimated resident population over the past decade;
- Sustainable and buoyant resource sector;
- Constant economic activity across other sectors;
- Fly-In/Fly-Out (FIFO) labour to provide the employment top-up for new construction activity and ongoing operational activity pertaining to the resources sector;
- Recent announcements regarding mining production cut backs are considered short term issues only; and
- Economic uncertainty will always exist and cannot be periodically or systematically included in the medium and long term forecasts.

Passenger movement forecasts assumptions for specific scenarios

The term “service” refers to an origin/destination sector. For example, an Adelaide/Broken Hill/Adelaide round trip is considered as two services for forecasting. In addition to the general aforementioned assumptions, a number of specific assumptions are provided below for each scenario in the forecast range.

Low scenario assumptions

- Sufficient capacity exists on Sydney to Broken Hill and Adelaide to Broken Hill sectors using SF340 aircraft and existing services;
- Passenger growth is reflected in progressively higher load factors increasing to an assumed 79% in 2027/28;
- No new routes;
- No new airlines flying to Broken Hill;
- No price competition; and
- Revenue passenger movements will increase to around 81,000 at the end of the forecasting period in 2027/28 at a compound growth rate of 1.4% per annum.

Medium scenario assumptions

- Sufficient capacity exists on Sydney to Broken Hill and Adelaide to Broken Hill sectors using SF340 aircraft and existing services until 2015/16, after which additional services are added;
- Passenger growth on the above services to 2015/16 is reflected in progressively higher load factors increasing to an assumed 70% before additional services are added;
- A new weekly service is assumed to be introduced between Melbourne and Broken Hill in 2012/13 by Virgin Blue, or a like carrier, using Embraer (EMB)170/EMB 190 or equivalent aircraft increasing to three services a week by 2027/28;
- No price competition; and
- Revenue passenger movements will increase to around 98,000 in 2027/28 at a compound growth rate of 2.4% per annum.

High scenario assumptions

- Initial sufficient capacity exists on Sydney to Broken Hill and Adelaide to Broken Hill using SF340 aircraft;
- Additional new airline and service on the Sydney to Broken Hill route using EMB 170/B737-600/A319 increasing from a weekly service in 2012/13 to a daily service by 2027/28;
- A new Melbourne to Broken Hill service using EMB 170/B737-600/A319 increasing from a weekly service in 2011/12 to a daily service by 2026/27;
- A new Central Australia link to Alice Springs or Kalgoorlie/Perth to service the Outback tourism and resource sectors;

- Strong price competition on Sydney to Broken Hill service capturing additional demand;
- Very strong resource sector resulting in Fly In/Fly Out (FIFO) labour from Sydney and Melbourne; and
- Revenue passenger movements will increase to around 127,000 in 2027/28 at a compound growth rate of 3.7% per annum.

Low, Medium and High Forecast Passenger Movements

Figure 4.1 and **Table 4.12** provide details of the Low, Medium and High forecasts for passenger movements over the next 20 years.

Figure 4.1 : Forecast Revenue Passengers 2008/09 to 2027/28

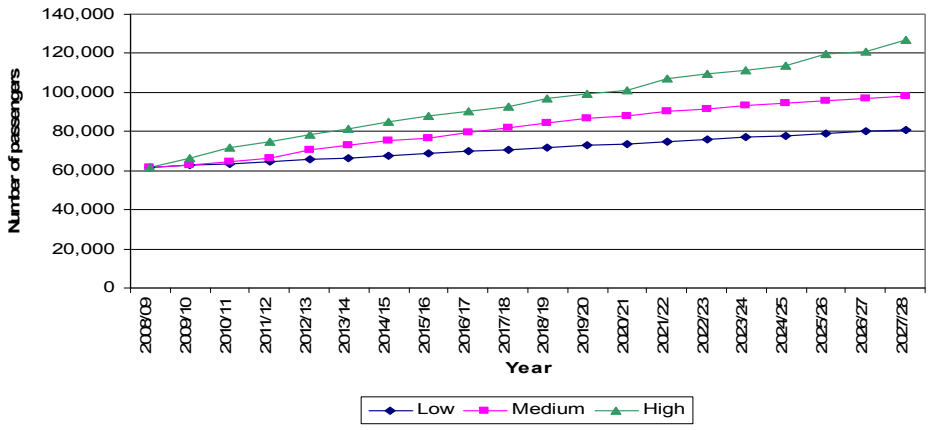


Table 4.13 : Forecast Revenue Passengers 2008/09 to 2027/28

Financial Year	Low	Medium	High
2008/09	61,526	61,526	61,526
2009/10	62,552	62,552	66,654
2010/11	63,577	64,603	71,781
2011/12	64,603	66,654	74,990
2012/13	65,628	70,888	78,382
2013/14	66,654	73,121	81,591
2014/15	67,679	75,487	84,983
2015/16	68,704	76,513	88,192
2016/17	69,730	79,352	90,558
2017/18	70,755	81,827	92,742
2018/19	71,781	84,165	96,850
2019/20	72,806	86,786	99,164
2020/21	73,832	87,991	101,296
2021/22	74,857	90,573	106,860
2022/23	75,883	91,813	109,356
2023/24	76,908	93,054	111,228
2024/25	77,933	94,295	113,412
2025/26	78,959	95,535	119,652
2026/27	79,984	96,776	120,848
2027/28	81,010	98,017	126,776
CAGR[1]	1.39%	2.36%	3.68%

[1] CAGR is the compound annual growth rate

Most Likely Scenario

Based on the no growth in permanent population assumption, short term declining economic conditions, and medium to long term uncertainly in the Broken Hill resources sector, the Low forecasts represent the "most likely" scenario at this point in time. The future buoyancy or otherwise of the resources sector in Broken Hill remains the key factor in the medium and long term influencing future revenue passenger forecasts.

4.6 Aircraft Traffic Forecasts

4.6.1 RPT Aircraft Movements

Aircraft movements are difficult to forecast and increases in demand for flights are generally absorbed:

- Initially by increasing existing load factors; then
- By increasing the number of aircraft movements; before
- Finally increasing the size of the aircraft.

The time at which aircraft sizes are increased and the type of replacement aircraft to be utilised can be influenced by a number of factors including the airlines operating the service, the route, travel origins/destinations, passenger volumes, the operator's aircraft fleet and its utilisation, and so on. Many of these factors are inter-related and are dependent upon circumstances which are not necessarily readily predictable.

Accordingly, it is difficult to forecast aircraft types and sizes operating to Broken Hill (and hence aircraft movements) with any degree of accuracy. The introduction of any new Low-Cost Carriers may have a major impact on aircraft types, sizes and frequency of operation.

The detailed air services including aircraft types and movements for the Low, Medium and High forecasts are provided in **Appendix D, Forecast Annual Aircraft Movement Tables 1, 2 and 3**, respectively.

4.6.2 GA Aircraft Movements

The Bureau of Infrastructure, Transport and Regional Economics General Aviation 2006 Annual Survey covered all of the Australian registered aircraft in the GA and Regional Airline sectors of the Australian aviation industry.

The GA sector is made up of all non-scheduled flying activity in Australian-registered aircraft, other than that performed by the major domestic and international airlines. The major categories of flying are private, business, training, aerial agriculture, charter and aerial work. In addition, the sport aviation segment of GA includes operations in ultra light aircraft, gliders, hang gliders and autogyros.

The basic measure of General Aviation is flying hours. All owners of Australian (VH) registered aircraft (with the exception of the Australian domestic and international airlines) are surveyed annually and asked to report hours flown by each aircraft in various categories of operation, as well as total landings per aircraft. Response to the 2006 survey increased from 71 per cent to 85 per cent.

The survey results indicated:

- Total hours flown in the General Aviation and Regional Airlines sectors in 2006 were 1.94 million, a decrease of 2.1 per cent from 2005. Activity in the General Aviation sector was 1.70 million hours, a decrease of 1.6 per cent while Regional Airlines showed a decrease of 5.2 per cent to 241,500 hours.
- Agriculture recorded the greatest decrease in activity with a drop of 35.0%, from 95,000 to 61,700 hours. Comments by respondents and on some returns mention the drought as a reason for decreased activity. Of all aircraft in General Aviation that reported a reason for nil flying, 2.3% specifically indicated drought. If Agriculture was totally removed from the 2005 and 2006 figures then General Aviation hours would have recorded a 0.3% increase.
- Private flying activity fell by 5.0% in 2006. Offset against this is the growth in ultralight flying, as reported by Recreational Aviation Australia, from 92,900 to 120,200 hours. Other sectors to fall were Business (-3.4%), Test and Ferry (-2.9%) and Charter (-0.9%).

- Aerial work (337,900 hours) and Training (424,000 hours) showed growth in 2006 of 6.0% and 2.0% respectively.
- The number of aircraft registered in scope of the General Aviation collection fell by 0.56% to 11 117. However between 2001 (24 aircraft) and 2006 (82 aircraft) there has been a steady increase in the number of new fixed-wing single engine aircraft and hours flown. New rotary-wing single engine aircraft also increased over this time from 16 to 51 new aircraft respectively in 2001 and 2006.
- In 2001, 29.9 per cent of fixed-wing single engine aircraft were 21-25 years old. In 2006 these aircraft have moved through to the next five year age category (26-30) and that category now makes up 28.1% of fixed-wing single engine aircraft (12.7% in 2001). The 21-25 year category has now dropped to 6.5% of this category of aircraft.
- In 2006, 27.0 per cent of fixed-wing single engine aircraft were over 40 years old. This is a significant increase on the 16.4% that were in this category in 2001.
- The proportion of fixed-wing multi engine aircraft over 40 years old has increased from 4.9% to 8.1% over the same period.

Table 4.14 shows the total GA hours flown for the period 1993-2006.

Table 4.14 Hours flown ('000') in General Aviation 1993 to 2006

Year	Private	Business	Training	Agriculture	Aerial work	Test & Ferry	Charter	TOTAL
1993	265.3	212.3	436.8	89.2	278.8	28.2	393.4	1,703.9
1994	256.9	198.5	419.5	78.9	301.7	25.9	424.4	1,705.7
1995	251.0	189.1	430.6	94.5	302.4	28.2	465.7	1,761.3
1996	261.6	182.8	444.9	117.4	285.7	26.2	480.4	1,799.0
1997	266.7	176.0	449.5	128.4	307.4	27.6	483.7	1,839.3
1998	263.0	163.8	478.5	139.2	312.4	26.6	494.6	1,877.9
1999	275.9	153.3	448.8	126.3	306.6	26.6	504.6	1,842.2
2000	248.5	136.3	413.6	115.0	296.9	27.9	476.7	1,714.8
2001	261.7	144.9	406.2	106.7	294.2	23.2	466.0	1,702.9
2002	270.2	142.2	410.8	70.8	327.1	20.9	445.7	1,687.7
2003	239.7	143.4	420.3	69.7	322.5	21.3	429.2	1,645.9
2004	247.2	143.0	352.2	86.5	312.4	22.3	481.4	1,645.0
2005	239.2	149.1	415.8	95.0	318.8	22.3	482.6	1,722.8
2006	227.2	144.1	424.0	61.7	337.9	21.7	478.4	1,695.0

Recreational Aviation (formerly known as Ultra Lights or Sport Aviation) consists of powered aircraft that are not “VH” registered. This is the fastest growing sector within the Australian aviation industry. Most of theses aircraft are registered under the classification of Recreational Aviation Australia (RAA), with some 2,900 aircraft registered as of December 2008. This is equivalent to 23.4% of all VH registered aircraft. The majority of these aircraft are home built and in many cases can out perform many main stream 2 and 4 seat general aviation aircraft. The hours flown by RAA aircraft are not captured in the above figures as these aircraft are not surveyed by the Department. It is estimated these aircraft could contribute up to an additional 50,000 movements per year.

Airports that impose landing fees are generally seeing a decrease in general aviation traffic with the high percentage of RAA aircraft coming into the market. This is primarily due to the owners of the RAA aircraft wishes to have low cost operations and operating into airports with either no landing fees or operating out of non registered airports or dedicated landing grounds.

On the basis of this data, it is difficult to perceive any significant growth in GA traffic at Broken Hill Airport. Rather any such growth may be related to the establishment of new businesses at the airport.

For the purposes of this master plan, GA fixed wing traffic has been forecast to grow at 2% per annum.

4.6.3 Helicopter Movements

Current helicopter operations are limited to mining surveys and localised operations in and around the Broken Hill basin. As these are very limited, official annual statistics are not available.

4.7 Air Freight Traffic Forecasts

Limited freight is carried in the hold of SF340 aircraft operating the RPT services. Additional freight is brought in on freight/courier aircraft operating at night. The freight is handled by local agent Australian Air Express.

It is not anticipated that there will be any significant increased demand for air freight services that would warrant the introduction of dedicated freight aircraft, and it has been assumed that any additional demand will be met through carriage in the hold of scheduled RPT aircraft.

5. Future Needs and Development Options

5.1 Basis for Airport Planning

5.1.1 Airport Planning Criteria

The planning criteria for airport development may be categorised into a three-tiered structure as follows:

- International standards and recommended practices (ICAO);
- National standards and advisory publications (CASA); and
- Local standards and practices.

The international standards and recommended practices are formalised in Annex 14 to the Convention on International Civil Aviation adopted by the International Civil Aviation Organisation (ICAO) under the provisions of the Convention. In addition, ICAO publishes a number of Aerodrome Design Manuals and Airport Services Manuals.

National standards and advisory publications are published by the Australian Civil Aviation Safety Authority (CASA) which administers the Civil Aviation Act (1988) through the accompanying Civil Aviation Regulations (CARs) and Civil Aviation Orders (CAOs).

The Manual of Standards Part 139 – Aerodromes (MOS Part 139) is a CASA policy manual, made pursuant to Civil Aviation Safety Regulations CASR Part 139. CASR Part 139 sets out the regulatory regime of aerodromes used by aeroplanes conducting air transport operations under CASR Part 121A and Part 121B. The regulatory regime provides for aerodromes to be certified or registered.

MOS Part 139 sets out the standards and operating procedures for certified and registered aerodromes, as well as for other aerodromes used for air transport operations.

The local standards and practices include:

- Federal and State government legislative requirements for environmental protection;
- Requirements of Local Government; and
- Requirements of Statutory Authorities supplying engineering services.

For the Broken Hill Airport Master Plan, the planning and design considerations include a combination of the requirements and recommendations of ICAO, MOS Part 139, and the adoption of local standards and practices. Generally MOS Part 139 standards have been adopted, but the report highlights where there are any significant differences between ICAO and MOS Part 139 standards.

5.1.2 Aerodrome Certification Requirements

Pursuant to the Civil Aviation Safety Regulations 1998 (CASR), aerodromes intended to accommodate aeroplanes with more than 30 passenger seats conducting air transport operations must be certified.

CASA aerodrome certification process only addresses the aviation safety aspect of the aerodrome. It is the responsibility of the owner of the aerodrome site to ensure that use of the site as an aerodrome is in compliance with other federal, state and local statutory requirements.

CASA must grant an aerodrome certificate under regulation 139.045, if:

a) The aerodrome's facilities and equipment are in accordance with the standards specified in the Manual of Standards for a certified aerodrome;
b) The aerodrome's operating procedures make satisfactory provision for the safety of aircraft;
c) An aerodrome manual in accordance with regulation 139.095 has been prepared for the aerodrome; and
d) The applicant would, if a certificate is granted, be able to properly operate and maintain the aerodrome.

Broken Hill City Council's current licence to operate Broken Hill Airport was granted in December 1994.

5.1.3 Aerodrome Reference Codes

Australia has adopted the ICAO methodology of using a code system, known as the Aerodrome Reference Code (ARC), to specify the standards for individual aerodrome facilities that are suitable for use by aeroplanes with a range of performances and sizes.

The intent of the Aerodrome Reference Code is to provide a simple method for inter-relating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodrome facilities that are suitable for the aircraft that are intended to operate at the aerodrome.

The code is composed of two elements that are related to the aeroplane's performance characteristics and dimensions. Element 1 is a number based on the aeroplane's reference field length. Element 2 is a letter based on the aeroplane's wing span and outer main gear wheel span.

For taxiway and apron works, the various geometric standards are controlled by Code Element 2. The code letter for Element 2 is determined from Table 5.1, Column 3, by selecting the code letter which corresponds to the greatest wing span, or the greatest outer main gear wheel span, whichever gives the more demanding code letter of the aeroplanes for which the facility is intended.

For instance, if code letter C corresponds to the aeroplanes with the greatest wing span and code letter D corresponds to the aeroplanes with the greatest outer main gear wheel span, the code letter selected would be "D".

Table 5.1 Aerodrome Reference Codes (Source: MOS Part 139)

Code Element 1		Code Element 2		
Code Number	Aeroplane Reference Field Length	Code Letter	Wing Span	Outer Main Gear Wheel Span (a)
(1)	(2)	(3)	(4)	(5)
1	Less than 800 m	A	Up to but not including 15 m	Up to but not including 4.5 m
2	800 m up to but not including 1,200 m	B	15 m up to but not including 24 m	4.5 m up to but not including 6 m
3	1,200 m up to but not including 1,800 m	C	24 m up to but not including 36 m	6 m up to but not including 9 m
4	1,800 m and over	D	36 m up to but not including 52 m	9 m up to but not including 14 m
		E	52 m up to but not including 65 m	9 m up to but not including 14 m
		F	65 m up to but not including 80 m	14 m up to but not including 16 m

a. Distance between the outside edges of the main gear wheels.

For reference purposes, Aerodrome Reference Codes for various aircraft are shown in **Table 5.2.**

Table 5.2 Aerodrome Reference Codes for Various Aircraft

Code 1A	Code 1B	Code 1C	Code 1D	Code 1E	Code 1F
Beech 23-100	Beech 80	DHC-4 Caribou	DHC-5E		
Britten BN2	Beech 90	DHC-7			
Cessna 152-421	Beech 200				
Fuji FA200-180	Cessna 402				
Grumman G164	Cessna 414				
Mitsubishi MU2	Cessna 441				
Piper PA18-PA60	Dornier D0228				
Pitts 2A	DHC-6 Twin Otter				
	Nomad N24A				

Code 2A	Code 2B	Code 2C	Code 2D	Code 2E	Code 2F
Lear Jet 24F Lear Jet 28/29	Beech 1900 Casa C212 Embraer EMB110 Shorts SD3-30 Metro III	ATR42 DHC-8-100/200/300 Cessna 550			
Code 3A	**Code 3B**	**Code 3C**	**Code 3D**	**Code 3E**	**Code 3F**
BAe125-400 Dassault DA-10 Lear Jet 25D Lear Jet 36A Lear Jet 55 IAI 1124 Westwind	BAe125-800 Canadair CL600 Canadair CRJ-200 Cessna 650 Dassault DA-20 Dassault DA-50 Dassault Falcon 900 EMB145 F28 – 2000 Shorts SD3-60	BAe146 BAe748 BAe Jetstream 31 BAe Jetstream 41 DC-3 DC-9-20 EMB120 EMB170 F27-500 F28-3000 F28-4000 F50 F100 Saab SF340A			
Code 4A	**Code 4B**	**Code 4C**	**Code 4D**	**Code 4E**	**Code 4F**
		Airbus A320 B717 B727 B737 Concorde DC-9/MD80 EMB190	Airbus A300 Airbus A310 B707 B757 B767 DC-8 DC-10/MD11 Lockheed L100 (C130) Lockheed L1011	Airbus A340 B747 B747 SP B777	Airbus A380

5.2 Overall Development Strategy

For Broken Hill Airport, the current facilities meet the following planning standards:

- Code 4C (B737 limited) for the 05/23 Runway, Taxiways A and C and the RPT Apron.
- Code 2B for the 14/32 Runway, GA taxiways and the GA Apron.

Based on the forecast demand detailed in **Section 4**, the likely future aircraft types to be considered in the planning for Broken Hill Airport are as shown in **Table 5.3.**

Table 5.3 Design Aircraft Types

	Typical Aircraft Type	Seats	Code
Current			
-RPT	SF340	36	3C
- Occasional Charter	B737	130-170	4C
Medium Term			
- RPT	Q400	78	3D
	EMB 170	78	3C
- Occasional Charter	B737/A320	130-170	4C
Long Term			
- RPT	B737/A320	130-170	4C

In order to accommodate the forecast traffic, planning should proceed on the basis of maintaining the existing Code 4C runway (width of 30 m) as the current standard for the 05/23 Runway, Taxiways A and C, and the RPT Apron.

Code 4C aircraft normally require a runway width of 45m. However, B737 and A320 aircraft are permitted to operate from 30 m wide runways in Australia under dispensations granted by CASA. **This dispensation limits the maximum weight of these aircraft to 68,100 kg.** In practical terms this has implications on range and/or payload. From Broken Hill based on a B737-800 with 160 passengers the aircraft would be able to fly up to 1,700 nautical miles.

The Code 4C standard will be applied to the 05/23 Runway (30 m runway width), existing Taxiways A and C, all future taxiways for RPT traffic, and the RPT Apron.

The 14/32 Runway currently complies with the geometric requirements for Code 2C and is theoretically suitable for most small propeller-driven aircraft up to 5,700 kg. No upgrading of the 14/32 Runway is planned. However, consideration could be given to sealing this runway (in the short to medium term) to reduce maintenance associated with the unsealed surface, and to minimize the potential for stone damage to aircraft propellers and fuselage skins.

5.3 Movement Area Development

5.3.1 Runways

Capacity

The capacity of the runway system is primarily dependent on:

- The number, dimensions and relative arrangement of runways;
- The number, location and type of runway exit and entry taxiways;
- The aircraft mix;
- The landing/take-off mix;
- The ambient weather conditions; and
- The mode of runway use.

The existing runway system at Broken Hill Airport has an estimated long-term annual capacity of the order of 180,000 movements per annum.

Comparison with the current traffic of approximately 2,841 aircraft movements per annum (2007/08) and the long term future traffic which is forecast as up to 7,000 aircraft movements per annum (high scenario in 2019/20) indicates that there is no requirement for any additional runways.

Orientation

It is not clear as to whether any previous analysis of runway useability at Broken Hill Airport has been undertaken.

For this Master Plan, wind frequency analysis and wind rose data was sourced from the National Climate Centre, and details are provided in **Appendix B**.

The data shows that:

- Morning winds are predominantly from the south (25%), north-east (15%), north (13%) and south-east (11%). These winds average between 15 and 20 km/h between April and August, and between 20 and 25 km/h between August and April.
- Afternoon winds are predominantly from the south (24%), west (15%), south-west (15%), north-west (11%) and south-east (11%). These winds average between 15 and 20 km/h in April and May, and between 20 and 25 km/h between June and March.

Based on this data, an orientation of closer to north-south would seem preferable. However, the 05/23 Runway appears to provide a high level of useability for all heavy aircraft operations (with cross wind components up to 20 knots).

The 14/32 Runway is required principally for General Aviation aircraft (and particularly for flying training) when the cross wind component on the 05/23 Runway becomes excessive.

Closure of the 14/32 Runway would restrict GA aircraft operations under strong cross wind conditions and would impinge upon the safety of GA aircraft operations in these circumstances.

For these reasons, retention of both the existing runways is recommended.

Length and Width

The existing 05/23 Runway is 2,515 m long and 30 m wide, with 3 m wide sealed shoulders. The runway is located within a 150 m wide graded runway strip. In its present configuration, the 05/23 Runway complies with the requirements for a Code 4C Non-Precision Approach Instrument Runway.

Take-off and landing distances are as detailed in **Section 2.3.1**.

It is difficult to provide a definitive assessment of runway length requirements for specific aircraft as there are many factors that influence the maximum take-off mass including the particular engine type, fuel reserves requirements and the ambient conditions. The following assessment of runway length requirements is based on:

- FAA Take-off Runway length requirements as published in the relevant aircraft manuals (Aeroplane Characteristics for Airport Planning);
- Zero runway gradient;
- Zero wind;
- Sea level;
- Standard day + 15^0C (i.e. 30^0C at sea level);
- No engine air bleed for air conditioning; and
- Average passenger including baggage allowance (90 kg).

Table 5.4 shows the maximum take-off masses and ranges for selected aircraft operating from the current runway length of 2,515 m with maximum passengers plus baggage, but no freight.

Table 5.4 Typical Aircraft Load and Range Limits for Existing (2515m) Runway Length

Aircraft Type	MTOM (kg)	Runway Length for MTOM (m)	Allowable TOM (kg)	Range (nm) for Max Pax plus Baggage
A321-200	89,400	3400	89,000	N/A
A320-200	73,900	2700	73,500	N/A
B737-900	74,616	3850	74,389	1300
B737-800	70,760	2200	70,534	1500
B737-700	60,554	1600	60,324	900
B737-400	65,318	3200	65,091	1400
B737-300	63,050	3400	62,823	2200
B717-200	50,349	1850	49,895	N/A
F100	43,320	N/A	43,090	N/A
EMB190	47,790	1750	43,000	N/A
Q400	27,330	930	27,987	N/A
EMB170	35,990	1550	32,800	N/A
SF340	13,065	1550	12,930	N/A

Note. Runway Lengths and TOMs based on dry runway.

These ranges permit the aircraft to reach the destination ports shown in **Table 5.4.** This information is indicative only and detailed studies and each individual airline operational requirements would be required for specific cases.

Table 5.5 Reachable Destinations for Current (2515m) Runway Length

Destination	Approx Route Distance (nm)	SF340	EMB170	Q400	EMB190	B737-400	B737-800	A320-200	A321-200
Adelaide	230	✓	✓	✓	✓	✓	✓	✓	✓
Dubbo	362	✓	✓	✓	✓	✓	✓	✓	✓
Melbourne	379	✓	✓	✓	✓	✓	✓	✓	✓
Canberra	434	✓	✓	✓	✓	✓	✓	✓	✓
Sydney	503	✓	✓	✓	✓	✓	✓	✓	✓
Alice Springs	635	✓	✓	✓	✓	✓	✓	✓	✓
Brisbane	668	✓	✓	✓	✓	✓	✓	✓	✓
Perth	1298	X	X	X	X	✓	✓	✓	✓
Darwin	1512	X	X	X	X	✓	✓	✓	✓

Note. Assumes direct services.

As indicated in **Table 5.4**, the current 05/23 Runway length of 2,515 m is generally suitable for all aircraft operations, supporting full passenger and baggage loads, with the exception of the smaller aircraft (SF340, EMB 170, Q400 and EMB 190) on long-range routes (Perth and Darwin). However, it is unlikely that these smaller aircraft would operate on these routes due to the requirement to stop for fuel.

It is noted that if a runway extension of the 05/23 Runway is ever required for operational reasons (not required in this planning horizon) an extension towards the north-east is possible. Council should consider protecting this area for future needs.

The existing 14/32 Runway is 1,000 m long and 30 m wide (no shoulders), within a 90 m wide runway strip. It complies with the requirements for a Code 2C Non-Instrument Runway. An extension of this runway is possible within the existing airport boundary, but no extension is considered necessary to accommodate the forecast traffic.

Strength

The current strength rating (Pavement Classification Number) of the 05/23 Runway is PCN 15/F/A/690/T which permits aircraft to operate at the take-off masses shown in **Table 5.5** at unrestricted frequency.

In order to allow A320/B737 jet aircraft to operate with effective payloads and range, the pavements will require strengthening to achieve a higher PCN value. The final PCN value would be dependent on actual aircraft weight, destination and frequency of operations. For A320/B737 aircraft operating at maximum weights for unlimited operations, a PCN value of 44 would be required. An increase in PCN value can be achieved by providing an overlay to the runway, taxiway and apron area. The depth of the overlay will be determined by proposed aircraft weights and frequency of operations.

The 14/32 Runway does not have a strength rating and is restricted to aircraft below 5,700 kg. After wet weather, aircraft loads may be further restricted by NOTAM to preserve the runway surface and to avoid damage.

Table 5.6 : Allowable Operating Masses of Aircraft
(Based on current 05/23 Runway PCN Rating)

Aircraft Type	Tyre Pressure (kPa)	Allowable Operating Mass (tonnes)
A320-200	1360	MIN TPC
B717-200	1100	MIN TPC
B737-400	1400	MIN TPC
B737-800	1470	MIN TPC
DHC8-100/200/300	805	MAX
EMB 170	914	34.0 TPC
EMB 190	1034	35.0 TPC
F27/F50	552	MAX
F100	920	29.6 TPC
Q400	1565	27.9 TPC
SF 340	790	MAX

Notes:
MAX denotes above the maximum operating mass of the aircraft
(i.e. the aircraft can operate without load restriction).
MIN denotes below the minimum operating mass of the aircraft.
(i.e. the aircraft cannot operate).
TPC denotes Tyre Pressure Concession required.

5.3.2 Taxiways

Configuration

The RPT Apron is linked to the 05/23 Runway by existing Taxiways A and C. Both are 15 m wide and are able to accommodate Code C aircraft with wheelbases less than 18 m. (i.e. all Code C aircraft with the exception of MD80 series aircraft.)

In order to minimise delays and to increase runway capacity by avoiding back tracking and/or queuing, it would be prudent to plan for and provide protection for a future parallel taxiway to the 05/23 Runway. The parallel taxiway would be constructed incrementally as dictated by traffic demand.

The parallel taxiway centreline is required to be located at 93 m from the 05/23 Runway centreline for Code 4C aircraft, for a Non-Precision Approach runway

Widths

New taxiways should generally be Code B for use by GA and commuter aircraft, and Code C for RPT aircraft. The taxiway, shoulder, graded strip and strip widths are as shown in **Table 5.6**.

Table 5.7 Taxiway Dimensions

Code	Taxiway Width (m)	Shoulder Width (m)	Graded Taxiway Strip Width (m)	Taxiway Strip Width (m)
B	10.5	3 (Note 1)	25	43
C	18 (Note 2)	3.5	25	52

Notes:
1. Not mandatory.
2. Code C taxiway width may be reduced to 15m if the aircraft wheelbase is less than 18m.

5.3.3 RPT Apron

The existing RPT apron has a width of 60 m and a length of 68 m to the north and 112 m to the south of the main terminal building.

An ultimate parking arrangement for the current apron is shown in **Figure 4 in Appendix A**. This layout also indicates that development towards the west and north-east is possible to match any terminal development in these directions. The ultimate apron development allows for four Code C aircraft to be parked concurrently and to operate independently.

It is anticipated that aircraft parking will remain under power-in/power-out operations in the long term as aerobridge connections and tugs for push-back are expensive, and could not be economically justified for the forecast traffic levels.

Considering the layout of the runway and existing terminal, it is appropriate that the terminal expansion and RPT Apron continue in a linear development parallel to Taxiways B and D.

5.3.4 General Aviation Facilities

General aviation activities include:

- Charter operations;
- Flying training;
- Joy flights;
- Aero Club; and
- Private flying.

Facilities for aircraft involved in these activities are concentrated in the north-west sector of the terminal area. This area caters for the existing demand.

GA hangar expansion is planned to be developed further to the north-east, with two rows of hangars currently planned as shown in **Figure 4 in Appendix A**. It is anticipated that in the longer term there will be further demand for hangars associated with:

- Charter operations;
- Development of maintenance and servicing facilities;
- Increased freight and express parcel services;
- Increased itinerant activity;
- Servicing the regional business community; and
- New charter helicopter base and service facility.

The Royal Flying Doctor Service (RFDS) is located on the western side of the terminal building and will remain in the same location. The RFDS has recently completed an expansion to their facilities.

5.3.5 Helicopter Facilities

Helicopter operations are also carried out from the GA area. Helicopter operations can often affect fixed wing aircraft with their downwash and associated spread of large volumes of air during manoeuvring operations. The planning of the GA area should incorporate development of a designated helicopter area in order to segregate as much as possible, the mix of fixed wing and rotary wing aircraft.

5.4 Terminal Area Development

5.4.1 Terminal Building

The terminal building is adequate to serve the existing operations and while it can absorb some growth, it will need to be expanded in the future to meet the growing market. Current legislation requires all RPT aircraft carrying 50 passengers or more and all jet RPT aircraft regardless of size to have passengers, carry on items and checked baggage fully screened. The impact of larger will not only affect the size of the building for passenger handling and processing, but will also have an affect on passenger and baggage handling security.

Council has no control over federal legislation in relation to aviation security matters and a change in legislation could have a major impact on the terminal layout to meet aviation security issues, such as the segregation of arriving and departing passengers, installation of security x-ray equipment and baggage handling system.

5.4.2 Roads and Car Parks

The roadway network to and around the airport is via a two-lane roadway from the outskirt of Broken Hill township to the airport. Once inside the airport boundary the road skirts the northern side of the terminal car park and up to the RFDS facility.

As this is the only major sealed road route to and from the airport, it also feeds traffic past the terminal and onto the buildings to the north of the RFDS facility.

As part of the road and car park upgrade, the intent would be to provide an alterative sealed road to the far north of the existing car park and vacant allotment. This will enable traffic to proceed directly to any proposed business park north of the existing car park, (see **Figure 4 in Appendix A**).

This would provide a direct feeder route to the newly extended RFDS facility.

Improving the road system in around the northern end of the airport would greatly improve the terminal frontage as a more user friendly thoroughfare. Widening the terminal entrance roadway would provide better access to the taxi rank, tour bus parking and meeters and greeters pick-up and drop-off zone.

In the short to medium term with the introduction of larger aircraft and any new airline would justify the requirement for a larger secured car park.

5.4.3 Engineering Services

To cater for the proposed expansion of the Broken Hill Airport both airside and landside, it will be necessary to undertake upgrades to the existing infrastructure.

Stormwater Drainage

Stormwater runoff from the existing buildings and hardstand areas is generally collected by an underground pipe system and delivered to an open swale system within the airport site. It is understood that the open swales act as a form of detention basin which discharges to an open drain located on private property to the north-west of the site or via a culvert under the 05/23 Runway which delivers stormwater flows to a dam located on private property to the south-east of the site.

The proposed development of the airport terminal building, taxiways, car park areas and business park will need to consider the additional stormwater runoff generated from these facilities and the impact on the existing stormwater system.

It is anticipated that the proposed business park and car park area will have built in detention storage to limit the effect on the existing stormwater system for major storm events (1 in 100 years). However runoff from these areas in minor events (1 in 5 years) and additional flows generated from the new taxiway/hardstand areas will discharge directly to the open swale system within the airport. This considered, it is proposed to upgrade the existing swale drainage system to meet the increased capacity requirements.

The construction of new taxiways proposed as part of the overall upgrades will require the installation of several culvert crossings to maintain the interconnection of the swale drains.

It is understood that the majority of the stormwater from the Broken Hill South stormwater system along with water from a nearby waste treatment plant is discharged down the existing open drain which runs through private property to the north-west of the site. The open drain terminates near the south-west end of the 05/23 Runway. At this point stormwater is collected in a grated pit and diverted across the airport site under the runway via an underground pipe before discharging to the existing dam, again located on private property. It is understood that an area north of the south-western end of the 05/23 Runway has been subject to flooding. Airport Maintenance staff identified that the open drain, located in the private property, commonly becomes overgrown hence restricting the capacity of the drain. Being located on private property access for the maintenance of the drain by Council or Airport staff is limited.

In order to minimise the potential for future flooding of the site, three alternatives are proposed:

- Upgrade the existing culvert under the main runway;
- Provide an open drain around the perimeter of the airport property boundary to convey the flows around the runway; or
- Provide a swale drain around the perimeter of the airport property boundary within the private property which connects directly to the storage dam.

It is highlighted that the above options will address stormwater runoff directly generated from the airport site itself, but do not resolve the issue of significant flows being generated from the Broken Hill South System. Should the open drain through private property be continued to be used as part of the Council and airport stormwater system, maintenance access must be established for Council personnel to minimise the potential for future flooding of the airport site. This would require the establishment of a drainage easement over the open drain or for the land to be purchased by Council.

A detailed drainage study would also be required to determine the total water runoff encapsulated by the open drain, not only from the airport, but from the Broken Hill South system to ensure that the drain has sufficient capacity.

Airport staff commented that bird movements are a problem at the south-western end of the 05/23 Runway. This is likely due to the presence of the nearby dam to the south-east of the site along with the water permanently stored in the open drain. Birds are likely to be tracking between the two water bodies. This may need to be addressed, if bird populations can not be controlled, by piping the stormwater rather than using the open drain system.

Electricity

The main electrical supply to the airport comes through the area designated for short to long term car park expansion. This area for car park expansion is relatively steep and will require significant earthworks to reduce the grades to acceptable levels for a car park to be constructed. It is recommended that a feature survey of this area be undertaken to determine the extent of earthworks required and any impact this may have on the existing electrical supply.

As confirmed by Country Energy, the existing supply infrastructure is as follows:

- There are two existing substations (Sub 14431 and Sub 14432) that are 300kVA and are fully dedicated to the airport, (see **Figure 12 in Appendix A**).
- In late 2008, 315kVA TX was installed at the Broken Hill Airport by an Accredited Service Provider (to CE standards) to supply increased load for the Royal Flying Doctor Service (RFDS) extensions. This was fully funded by the RFDS.

Table 5.7 depicts indicative KVA requirements. Reconsideration will be required once lighting, power, air-conditioning and special equipments ratings are finalized.

Table 5.8 Indicative KVA Requirements

Summary	Years	Total Additional Capacity Required
Short term	2009-2014	1,900
Medium term	2014-2019	7,450
Long term	2019-2024	3,250
TOTAL KVA		**12,600**

Water Supply

The current potable water demand to the Broken Hill Airport of 315 kL/yr has been provided by Country Water based on the actual water consumption. The future theoretical demand incorporating the business park and terminal expansion has been calculated as 189 mL/yr based on the Water Services Association of Australia (WSA) Design Guidelines. This future demand has been based on an assumed area and type of development. The WSA design guidelines are conservative and ultimately the actual water demand may be much lower than the theoretical demand.

The information provided by Country Water from their Water CAD model indicates that the current minimum water pressure to the airport site is 36.16 m, with the future demand this minimum pressure will drop to 33.12 m, (refer **Appendix C**).

Given the significantly increased water demand, it is anticipated that the existing internal supply system will be sufficient to continue servicing the terminal building, however a separate system will be required for the business park developments. With the development of the business park and the inclusion of additional fire hose reels, a booster pump system will be required to achieve required water pressure.

Sewer

The sewer authority for Broken Hill is Country Water. Country Water provides a service to the main entrance gate of the Broken Hill Airport. Country Water has indicated that they do not need to model the increased sewer demand as their system has excess capacity to cater for the additional flows. It is anticipated that the existing internal system will not have capacity to cater for the business park development. The existing system is anticipated to continue to service the existing terminal and RFDS buildings, with a separate system provided to service the business park.

To avoid the cost of a new sewer system a biolytic sewage treatment system may be considered for the business park development. These systems allow for the treated wastewater to be re-used for irrigation.

5.5 Support Facilities

5.5.1 Aircraft Refuelling

The principal facilities required for aircraft refuelling at an airport include:

- Depots incorporating fuel storage tanks, administration offices, employee amenities, storage area for refuelling vehicles and other ancillary facilities;
- Fuel pipelines or mobile fuel tankers for the transfer of fuel from the storage tanks to the aircraft; and
- Tank storage for both Jet A-1 and AVGAS.

The advantages and disadvantages of aircraft refuelling by mobile tankers or via fixed hydrant system have been assessed and the following conclusions have been drawn:

- The decision to install a hydrant refuelling system is normally taken by the oil companies after consideration of a number of factors;
- The volume of fuel throughput at Broken Hill Airport for RPT services is not at a level which would normally justify the cost of the installation of a hydrant system; and
- The existing fuelling facility is well located to serve both RPT and GA aircraft via tanker refuelling.

The fuel capacity of the existing system serves the current operations well. However, any increase in services or up lift of fuel will require either more frequent replenishments, or an increase in capacity, or a combination of both. The expansion of the fuel system will be based purely on demand requirements and negotiated between the fuel companies and the operators.

Apron pavements where refuelling of the aircraft is undertaken should regularly receive a fuel resistant surfacing to avoid damage to the bituminous surface through fuel spillage.

5.5.2 Airline Catering

Current trends at regional airports are that airlines carry onboard catering from the main capital city airports. It is envisaged that this trend will continue and there is no provision in the master plan to provide for airline catering activities at Broken Hill Airport.

5.5.3 Air Freight

Current air freight operations are low and adequately serviced from existing facilities, although these facilities have limited expansion capability, there is no plans for a dedicated air freight facility.

5.5.4 Airport Maintenance

The major component of the maintenance requirements at the airport is airside. The maintenance depot is located in the northern precinct of the site and access to the movement areas is via a non public road.

The Airport Master Plan retains the airport maintenance compound in its current location. Any expansion requirements to the maintenance facilities would be accommodated in its existing precinct.

5.5.5 Aero Club

The Aero Club of Broken Hill presently operates on land adjacent to the terminal entry road, and the facilities are retained in the present location in the master plan.

5.6 Operational Facilities

5.6.1 Aircraft Rescue and Fire Fighting Service

Aircraft Fire Fighting and Rescue Services (RFFS) are provided off site by the local fire and emergency services within the city of Broken Hill.

CASR Part 139H indicates that an Aerodrome Rescue and Fire Fighting service is required only at aerodromes from which an international air passenger service operates, or aerodromes through which more than 350,000 passengers passed on air transport flights during the previous financial year.

On this basis, no changes to the existing RFFS arrangements are required.

Fire fighting services to the buildings are provided by off site local fire and emergency services and existing fire hydrant system. Expansion of the buildings and in particular the business park may require the installation of boost pumps.

5.6.2 Navigation Aids

All of the following existing navigation aids are operating effectively and require no new provisions within the Airport Master Plan.

- NDB;
- VOR;
- DME;
- Movement Area Lighting;
- Apron Floodlighting (which requires an upgrade to meet MOS 139 lux criteria);
- IWDI;
- PAL;
- AT-VASIS; and
- Standby Generator.

The AT-VASIS will be replaced by a Precision Approach Path Indicator (PAPI) when it cannot be maintained in a serviceable condition or when CASA requires replacement for technical reasons.

5.7 Security

Broken Hill Airport is a designated security airport in accordance with the Federal Governments Airport Security Act.

Due to the changing world we now live in following a number of terrorist attacks around the world, the Australian Government has stepped up the level of security required at airports across the country. Security requirements are constantly being reviewed and updated on a regular basis.

The aerodrome boundary perimeter has an animal-proof fence to a height of 1.4 m or more. Broken Hill Airport monitors and compiles with the Federal Government's requirements for boundary fencing and security requirements.

5.8 Commercial Precinct Development

In order to increase revenue at airports and not be reliant on aviation related income, many airports now identify areas that are not required for future aviation use and where practical and applicable, turn this surplus land into non-aviation related activities.

Currently the only commercial activity and expansion at the airport over a number of years has been the RFDS museum facility, providing more public access (car park) and a larger exhibition area and facility. The only other expansion currently ear marked is in the BP fuel depot with the inclusion of an additional fuel storage tank.

There are a number of small commercial businesses (non-aviation) i.e. John Curtis & Son Pty Ltd – Cremator, Mr G.S. Wellings – Garage and Mr J.Gati – Garage.

Broken Hill Airport has two large parcels of land to the north of the existing airport operational areas that could be developed into aviation and non-aviation related business parks. **Figure 4 in Appendix A**, shows these areas depicted as Areas 8 and 15. Area 8 being the closest to the entrance is allocated for non-aviation business park, (i.e. offices, warehouses, etc).

Area 15 is allocated as an aviation business park which would support aviation related activities that would not require direct airside access. The types of businesses in the aviation business park could consist of avionics and aircraft components repair/overhaul and sales, aviation training, aircraft sales and storage or aircraft spare parts.

The development of the business parks would need to be developed after undertaking a sound marketing assessment, business and economic analysis.

The development of the business parks is discussed further in Sections 7 and 12.

6. Stakeholder Consultation

6.1 Stakeholders Consulted

The following stakeholders were consulted as part of the preparation of the Airport Master Plan:

- Broken Hill City Council - Airport Group;
- Broken Hill Tourism;
- Broken Hill Aviation Pty Ltd;
- Royal Flying Doctor Services
- Corner Country Air Services Pty Ltd;
- Wettenhall Air Services;
- Avis Rent A Car;
- BP Air & Corner Country Air Services;
- Flying Padre / Uniting Church;
- Kamachlo Aviation Fuels (Mobil)
- SD Freight;
- Jetset;
- Airport Kiosk;
- Crematorium;
- Aero Club;
- Yellow Cabs;
- Bemax Mining;
- Perilya Mining;
- CBH Mining; and
- Private Aircraft Owners.

6.2 Key Stakeholder Issues

6.2.1 Questions

Stakeholder consultation involving representatives from the Broken Hill City Council, airport staff and local operators was undertaken. The basis for the airport master planning was outlined to each stakeholder and the scope of questions and discussions was aimed to focus on the following aspects:

- Number of aircraft based at Broken Hill (if applicable);
- Runways;
- Taxiways;
- Apron area;
- Hangars;
- Fuel;
- Navigational and Landing Aids;
- Any other airside issues;
- Security Issues;
- Terminal;
- Car Park;
- Entry Road;
- Airline Services;
- Non-aviation Activities; and
- General Comments.

6.2.2 Comments

Whilst stakeholder comments varied, the main comments from the airport users were:

- Runways – seal the cross strip;
- Taxiways – extend to both ends of the main runway;
- Apron Area is currently ok;
- Tie Downs – the number of tie downs is ok but better marking would be helpful;
- Hangars – more are needed;

- Fuel – well serviced but card bowsers will be good;
- Nav Aids and Lighting – fine, although one respondent questioned the location of the receiver and transmitter;
- Other airside comments – broadcasting of weather would be helpful;
- Security Issues – Improve for leaving cars overnight/lots of locked gates but the fencing is a joke/Security fence shunts people towards the café causing a bottleneck/terminal structure with doors behind check-in staff is very awkward.
- Terminal – Public views and marketing could be improved/the security fencing makes it look ugly/fine for a rural airport;
- Car Park – Adequate/Taxi ranks needs to be reconfigured/Rental car park is too small;
- Entry Road – Clean up to make it more attractive/A new farewell – welcome sign is needed/the ½ round-a-bouts cause some confusion/there are lots of walkers and no footpath, this is especially dangerous near the cattle grid where there is also a bend in the road;
- Airline Service – Rex is expensive and cancels flights/Flights to Melbourne and Mildura would be good/service so people can come from Sydney and return on the same day would be good; and
- Non-aviation Activities – not necessary for a small regional town and airport; and
- General Comments – should be closer ties between Council and the aero community/should abolish landing charges/a good country airport.

Other comments include:

- Airport facilities are of a generally good standard and the terminal is in good condition and serves the community well;
- Rex has become unreliable in recent times with cancellations of flight due to aircraft unserviceability or pilot shortages;
- Fares are too high, it is easier to drive to Adelaide and fly to Sydney on a cheap fare and also knowing you can get to Adelaide;
- Hard to see a second carrier come to Broken Hill in the short to medium term;
- Council with their charges has forced about 20 aircraft/ultra lights to a private strip north of Broken Hill;
- Council should consider free hold land for hangars;
- Council leases are too short and costly; and
- Hard to say what businesses could be attracted to Broken Hill.

Detailed stakeholder comments are contained in **Appendix E**.

6.3 Stakeholder Presentation

On 2 September 2009, Aurecon presented the final draft of the Airport Master Plan to key Council members, stakeholders and the general public.

The issues rose ranged from more hangar facilities to meet the current needs of airport stakeholders to more one-to-one consultation with stakeholders and the Council, to the possibility of resealing and/or resurfacing the cross runway.

Following on from the formal presentation to Council on 2 September 2009, the Airport Master Plan was placed on public display for a further 28 days from 3 September 2009, with no further public comment received.

7. Airport Master Plan

7.1 Master Plan Principles and Objectives

The purpose of an airport master plan is to document the perceived development of the airport from its present configuration to its ultimate optimum configuration over the planning period and to make this information available to all stakeholders and other interested parties.

The master plan is, in essence, a site reservation plan that optimises the long-term layout of facilities in a manner that satisfies the strategic, operational and functional needs of the airport while minimising its impact on the local environment. The master plan is a management tool to assist in the planning and development of facilities in a rational, logical and economical manner without compromising existing operations. It is based on a long-term planning horizon of 20 years to 2027/28, but needs to consider the development staging of the various facilities to be constructed over the life of the airport.

The principal objective in undertaking the master planning is to provide a realistic representation of the future airport layout that will maximise the capacity of the site in a way which is compatible with the environment, the local community, and rational development of facilities, and yet maintain flexibility to cater to future changes in response to the dynamic aviation industry.

The master plan should be treated as a living document and should be reviewed on a regular basis. The normal review period is five years, however, if a significant opportunity is presented to council or a major event occurs this may also trigger a review of the master plan before the normal review period.

To achieve this objective the following planning principles have been observed:

- Catering adequately and economically for forecast and potential volumes and type of aviation traffic and associated ground traffic throughout the life of the airport site;
- Making maximum use of the airport site in an economical and effective way;
- Achieving a balanced airport design whereby each element of the airport has a potential capacity commensurate with the capacity of each other element;
- Ensuring the effective and efficient operation of each separate facility within the framework of the most effective and efficient overall design;
- Permitting the progressive development of airport facilities to meet the demand with minimum dislocation to existing facilities and operations;
- Retaining as far as practicable, flexibility and options for development to meet unforeseen demand or changed circumstances in foreseen demand;
- Achieving as far as practicable, compatibility with the surrounding community and development; and
- Providing for the integration of the airport system with other airports and with the surface transport system.

The operational and functional requirements of the Broken Hill City Council as detailed in the Brief and as determined from discussions during the course of the commission have been incorporated in the planning.

Adoption of this master plan does not represent a commitment by the Broken Hill City Council to provide the facilities described, or to adhere to the facility locations and dimensions, or to follow the time scales as documented. Additionally, promulgation of the master plan does not obviate the requirement to evaluate and justify specific developments at the time that they are proposed.

7.2 The 2008 Broken Hill Airport Master Plan

The 2008 Broken Hill Airport Master Plan is shown in **Figures 3 and 4 in Appendix A**.

The details that follow provide a consolidated description of the facilities adopted for the master plan which have emanated from the consideration of the future needs and development options detailed in **Section 5**, and the stakeholder consultation as detailed in **Section 6**.

7.3 Movement Area

7.3.1 Runways

The existing 05/23 Runway is retained. The current length of 2,515 m is generally suitable for all aircraft operations, supporting full passenger and baggage loads.

Although not required in the planning horizon of this master plan, it is noted that further extension of the 05/23 Runway towards either the north-east or south-west or a combination of both is possible, if ever required. This would be subject to additional land acquisition and Council may wish to consider preserving this area for any future runway expansion, should it be required.

In order to comply with the requirements of MOS Part 139, the 05/23 Runway is provided with 90 m long x 60 m wide Runway End Safety Areas (RESAs) at each end. The RESA now commences from the runway strip end, whereas previously it commenced from the runway end.

The existing 05/23 Runway strip is 150 m wide, which is suitable for the planned future development.

The runway pavement strength is suitable for the current traffic comprising propeller-driven aircraft, but upgrading will be required for to accommodate larger jet aircraft (A320/B737/EMB190/EMB170), if and when they are introduced in the future. The upgrading would consist of an asphalt overlay and the depth of the overlay would be dependent on future aircraft operating weights, destinations and frequencies of operations. To allow unrestricted weight and frequencies of A320/B737 aircraft, the existing PCN value of 15 would need to be increased to PCN 44.

The 14/32 Runway is retained in its current configuration. In the long term, and depending on the practicality and cost of maintaining the gravel surface, consideration should be given to sealing this runway.

7.3.2 Taxiways

The master plan retains all existing taxiways, and provides for new full-length parallel taxiway on the northern side of the 05/23 Runway.

A new connecting taxiway is provided between the 05/23 Runway and the GA apron area as shown in **Figure 3 in Appendix A**, to facilitate GA aircraft movements and to avoid these aircraft using the main taxiway access to the RPT, Commuter and RFDS Aprons.

The parallel taxiway to the 05/23 Runway is located 93 m from the runway centreline, which makes it suitable for Code 4C aircraft non-precision instrument approach procedures.

All new taxiways for Code C aircraft use will be 18 m wide (15 m wide if to be used only by aircraft with wheelbases less than 15 m), with 3.5 m shoulders. For Code B aircraft, all new taxiways will be 10.5 m wide. Shoulders are not required.

The pavement strength of the existing taxiways linking the runway and the RPT Apron is suitable for the current traffic comprising propeller-driven aircraft, but strengthening will be required for larger jet aircraft types similar to the 05/23 Runway.

Taxiways for light aircraft use only should be to Code A or Code B requirements, as appropriate for their location.

7.3.3 RPT Apron

The master plan provides for the development of the RPT Apron to the west and north-east to suit the future terminal development. It has been assumed that the apron will continue to operate under power-in / power-out arrangements, even in the longer term.

Figure 4 in Appendix A shows a possible future apron parking layout that can accommodate three Code C aircraft in the short to medium term, with provision for a fourth Code C bay towards the north-east.

The pavement strength of the existing RPT Apron is suitable for the current traffic comprising of propeller-driven aircraft, but strengthening will be required for larger jet aircraft types.

7.3.4 General Aviation Area

The master plan includes the retention of the GA area at the north-east end of the terminal area, and allows for future additional demand for facilities that cannot be accommodated in this area to be handled by the provision of new facilities on the eastern side of Taxiway B.

The Royal Flying Doctor Service is retained in its current location with provision to expand its hangar and the public car park area.

7.4 Terminal Area

7.4.1 Terminal Building

Terminal Function and Amenity Issues

The terminal needs to be developed in line with the projected growth and legislated security requirements at the time of any proposed works. The critical issues in any redevelopment are to ensure that terminal is functional and complies with government regulations (i.e. bag and passenger screening, secured passenger lounge), whilst maintaining a layout that provides flexibility for future growth.

Presentation and Function

The building exhibits a graceful quality of space, light and proportion that in conjunction with the surrounding landscaping gives visitors a positive and memorable experience.

However the existing terminal planning no longer caters to modern needs and expectations of terminal function and cannot cope with future increases in passenger numbers, requirements for passenger security and airline operations using larger aircraft.

Key functional issues to be considered for planning purposes for the redevelopment of the terminal at Broken Hill Airport include:

- Introduction of passenger and baggage screening requirements.
- Segregation of circulation paths for arriving and departing passengers.
- Automation/semi automation of baggage make up/break down facilities to cope with OH&S and larger aircraft requirements.
- Adequate provision of customer check in facilities with automated baggage handling systems and ability to introduce checked bag screening if required.
- Provision of adequate passenger lounge area and seating with ability to introduce security screening if required.
- Provision of improved amenities including larger concessions facility, additional toilet facilities and improved disabled access.
- Provision of additional passenger vehicle drop off and pick up positions outside terminal, additional short and long term car parking, secured long term park, taxi rank bays and tour/ bus parking.

The existing terminal would require upgrading to accommodate jet services with up to 170 passenger seats. The introduction of jet services would automatically trigger the requirements for the introduction of passenger and baggage screening services. The extensions to the existing terminal, while addressing the functional issues noted above would be designed to compliment the existing architecture and develop and enhance the quality of the original design aesthetic.

Terminal Viability

To remain economically viable, the proposed terminal upgrade must address the following issues:

- Provide adequate infrastructure to allow multiple airline operations.
- Provide adequate infrastructure for upgraded security measures resulting from introduction of larger jet aircraft or changes to existing legislation requiring security screening measures for existing aircraft.
- Provide opportunity for expanded concessions activities including cafe operations, retail operations, car rental and resort desk operations.
- Allow efficient operation by ground handling agents or contractors of passenger check in and all baggage handling functions.
- Provide durable low maintenance finishes and fittings throughout the terminal.

Baggage Collection Improvements

To address the issue of baggage collection congestion, it is proposed to provide a baggage carousel with a presentation length of 25 m within the refurbished Arrivals area.

This would comfortably address the requirements of the 50 seat design aircraft and would cope (albeit with increased but acceptable level of congestion) with an increase in aircraft size up to 100 seat capacity.

The associated baggage break down area is secured from public access and could be undercover and screened from prevailing bad weather. Provision of adequate external manoeuvring clearance for baggage tugs and barrows should be considered.

Lounge Improvements

The passenger lounge should be designed to cater for up to 140 persons (based on a mix of 80 passengers and 60 friends equivalent to two 50 seat aircraft or a single 100 seat aircraft at 80% load factors).

The lounge should be designed to be accessed (if required) via a security screening check point including two walk through metal detectors and single X-ray bag screen with associated divest tables and roller beds.

Two boarding gates should be provided with a central customer service desk providing for future automated boarding pass reader installation (if required) by the airlines.

Concessions Improvements

A retail concessions facility could be located to provide maximum exposure and accessibility to passengers and visitors to the terminal as well as to the wider aerodrome precinct population and thus could attract patrons from RFDS tour groups and passing visits to the RFDS.

No provision has been made for additional concessions facilities within the future sterile departures lounge due to the location of the main retail concessions facility and preference to maintain a single operation for staffing and operational efficiencies.

The opportunity to relocate and expand car rental facilities and introduce tour desk operations within the terminal needs to be considered. With growth in passenger numbers it could be expected that the number of car rental concessions operating within the terminal may grow, and that tour and resort operators may also seek terminal space.

Presentation and Function

The proposed larger retail facility provides improved product display and customer service functionality and a new kitchen facility capable of accommodating future growth in patronage.

The facility upgrade could provide dedicated patron seating in an internal air conditioned environment with the option of access to external seating areas protected by overhead sunshading and screened from adjoining circulation zones by landscaping.

Car rental and tour desk operations would operate within the Arrivals Hall in a concourse location that offers good exposure to arriving passengers, yet is away from baggage claim congestion. There is opportunity for concourse hall seating and room for queuing in busy periods.

Accommodation of Future Airlines

A check-in/departure hall with six passenger check in counters would need to be considered for 50 or more passenger aircraft operations. Tenancy areas have been provided for lease by airlines for back of house operations and administration functions.

The check-in counters are each to be equipped with a motorised injector belt leading onto a shared conveyor belt feeding out to the baggage make up area. The proposed facility could cater for up to two airlines at any one time, however should another airline need to operate within the terminal, the following alternatives should be considered:

- Arrangements made with existing ground handling agents to act as the agent for any new airline;
- Extension of check in facilities within the Departures Hall with the introduction of a baggage make-up loop; and
- The consideration of introducing a Multi User facility which would allow all check in counters to be available to airlines for check in periods with baggage handling to be undertaken by the terminal owner or their contractors. Such a conversion would require a check in computer system suitable for multi user check in positions.

Covered Access to Car Parks/Taxi/rental Cars

Covered awning connection across roadways to the taxi rank and general car parking area could be considered with a minimum clearance of 4.5 m to allow bus clearance at road crossings. This would have a secondary effect of clearly defining the car park pedestrian access point.

Figures 5 and 6 in Appendix A show indicative terminal layouts for the short-term, and medium to long-terms, respectively.

7.4.2 Roads and Car Parks

The Airport Master Plan includes the provision for the following upgrades to existing facilities:

- New access road to RFDS facility.
- Rearrangement of the intersection of the airport access roads and the roads linking to the terminal and car park. This should proceed in the short term to avoid any safety issues.
- Long term expansion of the RPT car park to the north to suit the terminal development.
- Medium to long term extension of the public roadway to the eastern of the aerodrome (linked to the existing airport roadway), (see **Figures 3 and 4 in Appendix A)**.

7.5 Support Facilities

7.5.1 Aircraft Refuelling

The Airport Master Plan retains space to the west of the existing Mobil fuel depot for further development of fuel storage and servicing. With no significant increase in the RPT services is forecast in the short to medium term, there is no immediate upgrading of the facilities likely to be required.

7.5.2 Airline Catering

Current trends at regional airports are that airlines carry onboard catering from the main capital city airports. It is envisaged that this trend will continue into the future and there is no provision in the master plan to provide for airline catering activities at Broken Hill Airport.

7.5.3 Air Freight

No new facilities are required in the short term. Sufficient potential lease areas exist in the terminal area for the short to medium term requirements.

The Airport Master Plan contains provision for the development of a dedicated air freight facility at the eastern end of the abandoned 07/25 Runway.

7.5.4 Aircraft Maintenance

Allocation of development areas in the north-eastern GA area provides sufficient land with landside and airside access and proximity to existing infrastructure to provide for future expansion of general aviation maintenance facilities.

7.5.5 Aircraft Storage Area

During the consultation phase an opportunity arose in relation to using Broken Hill for either short or long term aircraft parking/storage. The Airport Master Plan contains provision on the eastern disused runway to allow for aircraft to parked either on a short or long term basis. The size of the aircraft will be determined by the existing or upgraded infrastructure. ie runway and taxiway capability.

7.5.6 Airport Maintenance

The existing airport maintenance area is well located and of sufficient size to meet future needs.

7.6 Operational Facilities

7.6.1 Aircraft Rescue and Fire-Fighting Service

These services are provided off site by the local fire and emergency services located in the City of Broken Hill. With the forecast traffic well below the threshold (350,000 passengers per annum) of requiring on site Aircraft Rescue and Fire Fighting Services, no changes to the existing arrangement is required.

7.6.2 Navigation and Landing Aids

The airport is well served by the existing navigational aids. The Airport Master Plan retains all of the existing navigation aids in their current locations and retains provision for the development of future ground based GPS augmentation facilities.

The airport currently has AT-VASIS system which is located on the left hand side of Runway 05/23 thresholds. These should be replaced with a PAPI system when existing spare parts can no longer support the operational requirements and/or when CASA determines that AT-VASIS will be replaced by PAPI's.

7.7 Security

Council has an obligation under the Aviation and Security Act to provide a safe and secure environment for conducting aviation activities. The operation of RPT services provides a different level of security requirements. Broken Hill City Council is a nominated security controlled airport.

Council has no control over federal legislation in relation to aviation security matters and a change in legislation could have a major impact on the terminal layout to meet aviation security issues, such as the segregation of arriving and departing passengers, installation of security x-ray equipment and baggage handling system.

A security review of the airport is outside the scope of this Master Plan process and Council monitors all regulatory requirements to ensure that it is compliant as legislation changes.

7.8 Commercial Precinct Development

Broken Hill Airport has two large parcels of land to the north of the existing airport operational areas that are not required for airport operations and could be developed into aviation and non-aviation related business parks. **Figure 4 in Appendix A**, shows these areas depicted as areas 8 and 15. Area 8 being the closest the airport entrance is allocated for non-aviation business park, i.e. offices, warehouses etc.

Due to the large parcel of land, the business park could be further split into two, zoned offices/warehouse and light industrial comprising of light manufacturing, car smash repairs, wrecking, transport storage and repairs.

Area 15 is allocated as an aviation business park which would support aviation related activities that would not require direct airside access. The types of businesses in the aviation business park could consist of avionics and aircraft components repair/overhaul and sales, aviation training, aircraft sales and storage or aircraft spare parts.

The development of the business parks would need to be developed after undertaking a sound marketing assessment, business and economic analysis.

Marketing of the business parks is discussed in Section 12.

8. Environmental and Land Use Planning

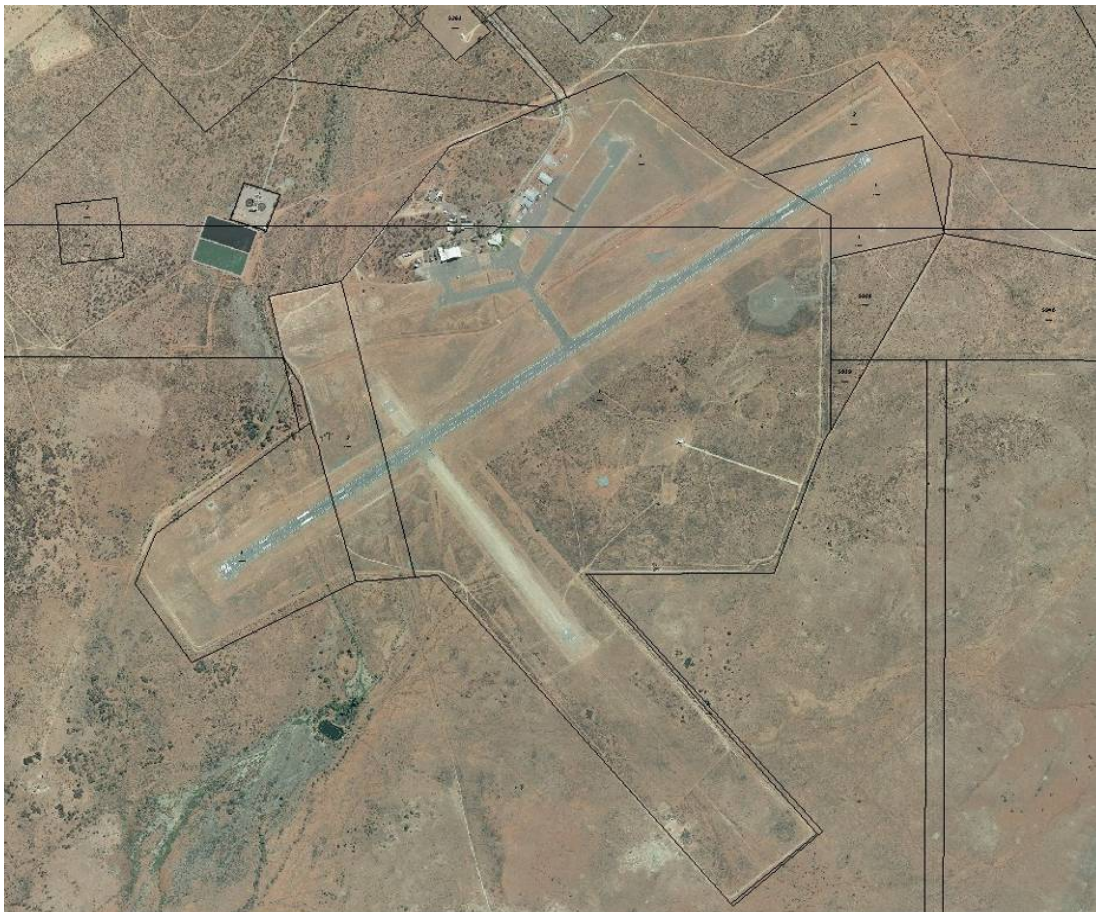
8.1 Physical Environment

Figure 8-1, shows the extent of the airport land. It also shows the airport operational area which includes the aircraft movement areas, the passenger terminal and general aviation areas. The airport operational area is generally bounded by rural land. To the north the land is a regeneration reserve and approximately 1 km further to the north is residential development. The remaining land surrounding the airport to the east, south and west is rural.

The airport operational area has been largely undisturbed during the development of the airport. The developed area of the airport is asphalt with some undeveloped areas (some of which are grassed or otherwise lightly vegetated). The built areas consist of the terminal, car parking area, hangar facilities for maintenance services, light aircraft operators and freight handling, the Aero Club building and other airport activity related buildings.

The topography of Broken Hill Airport land and the surrounding area is relatively flat. Vegetation is present, particularly to the north and north-west of the terminal and associated buildings.

Figure 8-1: Extent of Airport Land



Source: Broken Hill City Council

8.2 Environmental Effects of Airport Development

8.2.1 Flora and Fauna

The surrounding landscape is vast and unique and contains various outback flora and fauna. A search of the Australian Natural Resources Atlas revealed that native vegetation in this region may include the following types of species:

- Eucalyptus low open forest;
- Eucalyptus woodlands;
- Acacia forest and woodlands;
- Callitris forest and woodlands;
- Casuarina forest and woodlands;
- Eucalyptus open woodlands;
- Acacia open woodlands;
- Mallee woodlands and shrublands;
- Acacia shrublands;
- Tussock grasslands;
- Hummock grasslands; and
- Chenopod shrub, samphire shrub and forblands.

The vegetation provides habitat for various fauna species as shown in **Figure 7 in Appendix A**. Any vegetation removal associated with future development would require an assessment of the potential impacts on vegetation and habitats.

8.2.2 Indigenous and Heritage Areas

The Register of the National Estate database has indicated that neither mapped indigenous nor built heritage sites exist within the airport boundary.

8.2.3 Airport Noise

Aircraft noise and noise emanating from airport sites continue to receive a large amount of public attention worldwide. Although aircraft engineering advances have significantly reduced aircraft noise, the problem remains as one of the most difficult challenges in airport planning.

The factors that are important in assessing the likely impact and extent of intrusion and disturbance created by aircraft noise include:

- The perceived loudness of the noise;
- The proximity of the airport to community populations;
- The type of aircraft;
- The duration and time for which the noise is present;
- Whether the noise occurs in the day time or night time;
- The location of flight paths in the vicinity of the airport including the ascent and descent profiles;
- The sensitivity to and density of the population in areas exposed to high levels of sound; and
- The number of noise events in any period of time.

A further influence on the perception of aircraft noise is that of the predominant meteorological effects. The propagation of noise through the atmosphere is complex, mainly because the noise is not uniform, and meteorological effects can cause significantly different noise levels to be heard on the ground from one flyover to the next.

The main meteorological factors affecting noise levels are:

- Discontinuities in the air arising from wind or temperature gradients leading to diffraction, scattering or shadowing of the sound;
- Turbulence of that air near the ground surface; and
- Varying rates of atmosphere absorption with temperature and humidity conditions.

The noise level of an actual operation of an aircraft type can vary by about five decibels because of these influences.

The commonly identified effects of noise include:

- *Subjective* effects of annoyance, nuisance and dissatisfaction;
- *Interference* with activities, such as sleep, speech and learning; and
- *Physiological* effect, such as startle and hearing loss.

However, it is clear that the effects differ from person to person. Whilst one particular group of individuals may feel affected by the noise originating as a result of aircraft operations, another may not.

In relation to airports, the most important factors that affect an individual's behaviour in relation to overflying aircraft have been found to be:

- Negative attitudes to the airport, airlines, or the aviation industry in general (including their inability to effectively control noise);
- Sensitivity to noise in general;
- Fears that aircraft might crash into neighbourhoods surrounding the airport; and
- Interference with television and communications between people (personally or whilst on the telephone, etc).

The Australian Noise Exposure Forecast System

The Noise Exposure Forecast ("NEF") techniques developed in the USA were refined for Australian conditions to form the Australian Noise Exposure Forecast (ANEF) system which is now incorporated into Australian Standards (AS 2021 – 1994), and its use is Commonwealth Government policy.

Three different types of aircraft noise contour maps are produced using the ANEF system. All three types are produced using the same computational process, the US FAA Integrated Noise Model (INM). The differences between the three types arise from the data that is input.

(a) ANEF – Australian Noise Exposure Forecast

This is a contour map showing the forecast of aircraft noise levels that will exist in the future. The contour set may relate to a particular year, generally about 10 years from the date of issue, or it may be an "ultimate capacity" forecast. In the former case, it is based on a forecast of aircraft movement numbers, aircraft types, destinations and a given set of runways at the airport for a particular year. In the latter case, it may incorporate several sets of such information relating to progressive stages in the development of an airport within a definite time horizon. An ANEF requires review at regular intervals (about 5 years) to ensure its continuing validity.

The ANEF map is the only one of the three types of map that is intended to have status in land-use planning decisions. It will have been subjected to review by relevant authorities before release and, for civil airports the map will display the official endorsement of Airservices Australia and the date of that endorsement.

(b) ANEI – Australian Noise Exposure Index

This is a contour map based on historical data from a previous year, where actual numbers and types of aircraft that used the airport are known. It shows the average daily aircraft noise exposure around the airport for that year.

ANEI maps are used principally as benchmarks or indicators of change of aircraft noise exposure.

(c) ANEC – Australian Noise Exposure Concept

This is a noise contour map that may be produced during consideration of options for airport development. It is based on a hypothetical set of conditions of runways, aircraft types, etc., and there may be several ANEC maps prepared for the same future year. It may be a supposition for a long way into the future, and may never occur.

Because it has a hypothetical basis and/or may not have been subject to review by relevant authorities, an ANEC map has no official status and cannot be used for land-use planning purposes.

An ANEC map may be converted into an ANEF map only through endorsement by Airservices Australia

The ANEF is constructed using a computer model to generate contours that link together similar points of equal forecast exposure. The contour levels of 20, 25, 30, 35 and 40 are usually used as ANEF units with the severity of noise exposure increasing with the ANEF value. The model/technique allows a scientific measure of noise exposure levels around an airport taking into consideration the following factors:

- The intensity, duration, tonal content and spectrum of audible frequencies occurring in aircraft take-off, and landing (and reverse thrust after landing) manoeuvres;
- The forecast frequency of aircraft types and movements on flight paths; and
- The average daily distribution of aircraft take-off and landing movements in daytime (defined as 7am to 7pm) and night time (7pm to 7am).

To put the contours described above in context, residential development is commonly considered acceptable in areas outside (below) the ANEF 20 contour, conditionally acceptable in the range of 20-25, and simply not acceptable in the range above 25 ANEF.

It is important to note that contours are sometimes influenced by meteorological influences, described above, and other factors such as individual flight paths, etc. For this reason, the ANEF 20 contour is normally shown with a dashed line to reflect the inherent variability in its actual location.

Noise exposure forecasts provide guidance for land use planning in areas surrounding airports. **Table 8.1** details the land use planning guide incorporated in AS 2021 which protects both the community from excessive noise and the longevity of the airport (in terms of encroaching incompatible land uses). Being difficult to retrospectively introduce these guidelines, the table usually provides guidance for new developments.

Table 8.1 ANEF Levels (Planning Guidelines)

Building Type	ANEF Level		
	Acceptable	Conditional	Unacceptable
House, home units, flats, caravan park	**Less than 20 ANEF**	20 to 25 ANEF	Greater than 25 ANEF
Hotels, motels, hostel	Less than 25 ANEF	25 to 30 ANEF	Greater than 30 ANEF
Schools, university	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Hospitals, Nursing Homes	**Less than 20 ANEF**	20 to 25 ANEF	Greater than 25 ANEF
Public Buildings	Less than 20 ANEF	20 to 30 ANEF	Greater than 30 ANEF
Commercial Buildings	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light Industrial Buildings	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other	All ANEF zones		

Source: Standards Association of Australia AS 2021-1994

Notes:

- The actual location of the ANEF 20 contour is difficult to define due to aircraft and flight path variations;
- Within the 20 to 25 ANEF, some people may find the land is not compatible with residential use. Authorities may determine that alterations to building design are required to control noise impacts.
- Further details are available in AS 2021 – 1994.

Broken Hill Airport ANEF

No ANEF plan has been produced for Broken Hill Airport to date due to the low number of aircraft movements and the very low number of small jet operations. Final approach and take off from the main runway is not over any built up areas, and the cross runway which is used by light aircraft has limited operations over a very small part of the city.

Should Council wish to develop land under the direct flight paths, Broken Hill Airport would need to undertake the services of an agency to investigate ANEF impacts pending the increase in aircraft operations or the commencement of regular jet RPT operations.

Airservices Australia recommends that ANEF plans should be updated preferably every five years and no later than ten years.

8.2.4 Air Emissions

Air emissions are an environmental issue for most major urban areas in Australia and throughout the world. As with cars, trucks, trains and the like, aircraft engines also emit exhaust gases however the majority of the substances emitted *(nitrogen, oxygen and water)* are not regarded as air pollutants. It is the particulate matter, carbon monoxide, carbon dioxide, unburnt or partially burnt hydrocarbons and nitrogen oxides that are the most significant air emissions from airports. Dust from excavation works for development can also be a significant potential impact.

Aircraft operation ordinarily consists of five distinct phases relevant for air pollutant discharge consideration:

- Taxi or idle;
- Take-off;
- Climb-out;
- Cruise at altitude; and
- Approach and landing.

Table 8.2 broadly represents the operational phases and indicative pollutant discharge levels:

Table 8.2 Indicative Pollutant Discharge Emissions

Aircraft Operational Phase	Emissions			
	Particulates	Carbon monoxide	Hydrocarbons	Nitrogen Oxides
Taxi or idle	**moderate**	**high**	high	low
Takeoff	high	low	low	high
Climb-out	high	low	low	high
Cruise at altitude	**moderate**	**moderate**	moderate	high
Approach and landing	moderate	moderate	moderate	moderate

Increasingly stringent controls have led to a decrease in aircraft air emissions, however some have argued that more efficient 'burns' of fuel may increase production of NO_x

Compared to other emitters, the aviation industry is a relatively small contributor to overall air emissions as evidenced by the Department of Environment's *Air Emission Inventory – South East Queensland Airshed Technical Report 1997*. The contribution to the overall airshed by the aviation industry is minor compared to other industrial sources in South East Queensland. Similar results have been determined in both Perth and Adelaide. This is also supported by overseas airport-related studies.

Based on the EPA's 1997 study, current Commonwealth National Pollution Inventory (NPI) studies around Australia and normal operations at Broken Hill Airport, it is concluded that the potential impact of air emissions resulting from operations at the Broken Hill Airport is not significant.

All developments within the airport boundaries that have potential to emit dust or other significant air emissions must include environmental management strategies to manage or mitigate potential impacts. It is the responsibility of the proponent to identify the need for and undertake assessment and management of air emissions for any proposed development.

8.2.5 Construction Impacts

Potential environmental impacts associated with any of the proposed development works within the airport boundaries must be addressed as part of an environmental assessment and environmental management plan for the works. All assessments and management plans must comply with the requirements of relevant regulatory authorities and, where relevant, Broken Hill City Council's environmental procedures.

It is the responsibility of the proponent to identify the need for and undertake assessment and management of potential environmental impacts for any proposed development.

8.2.6 Drainage Pollution Control

No pollution control devices exist in the current airport drainage systems.

8.2.7 Solid Waste Management

An appropriately qualified waste contractor must remove all solid waste (originating from the airport site) to a Broken Hill City Council approved recycling facility or to a licensed treatment or disposal site.

Any new major development at the airport site must develop an environmental management plan that addresses waste management for that development. It is the responsibility of the proponent to identify the need for and undertake assessment and management of potential waste management issues for any proposed development.

8.2.8 Visual Impacts

As the demand for the airport and its services increase, so will the need to maintain and enhance the attractiveness of the airport as an important gateway to the Broken Hill region. The visual impact of airport development is expected to be very minimal given the flat elevation of the airport site, the lack of views into the airport precinct and the expansiveness of views across and within the airport boundary. The aesthetic improvement of the airport environs (particularly the entry/exit roads) through increased landscaping and progressive re-development is anticipated to improve the existing visual environment.

8.2.9 Bird Strike Hazard

Bird strikes, while infrequent at Broken Hill Airport, do occur and require careful management practices. The vegetation provides habitat for various bird species as shown in **Figure 7 in Appendix A**.

Any new (or existing) ornamental landscaping proposed for the airport must take into account the potential to contribute to the risk of bird strike. As such, new developments in the vicinity of Broken Hill Airport must ensure that landscaping does not have the potential to affect and or increase the likelihood of bird strike risk.

8.2.10 Acid Sulphate Soils

The airport is not in an area that is likely to be subject to acid sulphate soils.

8.2.11 Flood Prone Areas

The airport site contains a number of water courses as shown in **Figure 8 in Appendix A**.

Some areas of the airport are subject to flooding as shown in **Figure 9 in Appendix A**.

8.3 Land Use Planning

8.3.1 Zoning

The airport is zoned City 2(c) and is surrounded by land zoned Rural 1(a) to the north and east, and Environmental Protection 7(a) (Regeneration Reserve) to the north-west as depicted in the Broken Hill Local Environmental Plan 1996. Further from the airport are rural areas, including areas containing small holdings. These zones define constraints to the potential development of the airport and surrounding areas.

The objective of the City 2(c) Zone is to promote development in the City of Broken Hill in a manner which is compatible with its urban function. Under the City 2(c) Zone, prohibited development consists of abattoirs, extractive industries, intensive livestock keeping establishments, mines, offensive or hazardous industries. All other development requires development consent unless it is exempt or complying development.

The site is not affected by a heritage conservation area and it is understood that no items of built heritage or archaeological significance are located on or within the vicinity of the site.

8.3.2 Aircraft Noise

Aircraft noise currently has a minor impact on the surrounding areas of Broken Hill Airport. The main noise affected residential areas are to the north of the airport in South Broken Hill. Should Council wish to develop land under the direct flight paths the production of an ANEF will assist with zoning of land around the airport. This should also be reviewed if traffic increases significantly or if regular jet operations are introduced.

8.3.3 Obstacle Limitation Surfaces

The protection of airspace in the vicinity of Broken Hill Airport is important to ensure the safety of aircraft and the surrounding community by eliminating obstacles in the airspace that may pose a hazard to airborne aircraft. This is achieved by developing a set of Obstacle Limitation Surfaces (OLS) which define protection requirements for the initial and final stages of a flight takeoff, preparation to land and the landing itself. Visual connectivity between the airport runway and the pilot is of particular importance during these phases as is the pilot's ability to avoid obstacles and other aircraft.

OLS are conceptual (imaginary) surfaces associated with a runway that identify the lower limits of the airport airspace above which objects become obstacles to aircraft operations.

The objective of developing OLS plans is to define a volume of airspace around an airport which must be kept free from obstacles that may hinder aircraft operations during the critical phases of the flight and those that may interfere with aircraft instrumentation. The ultimate aim is to ensure that all obstacles within the area that are likely to be near to or protrude within the OLS are examined for their impact on aircraft operations.

Sometimes protruding structures within or near to the OLS limits can be painted or marked or provided with safety lighting to attract the pilot's attention. Any protruding obstacle within the OLS may ultimately however, restrict or impose changes on aircraft operations that may prejudice efficient operations in either busy operational times or in times of bad weather. This may result in alterations to flight paths, utilisation of less than full runway length, a requirement for fewer passenger numbers or weight loads, or less fuel loads to assist with aircraft uplift.

The term OLS is used to refer to each of the imaginary surfaces which together define the lower boundary of airport airspace, as well as to refer to the complex imaginary surface formed by combining all of the individual surfaces.

Conical Surface

The conical surface comprises both straight and curved elements that slope upwards and outwards from the edge of the Inner Horizontal Surface to a specified height above the Inner Horizontal Surface.

Inner Horizontal Surface

The inner horizontal surface comprises a horizontal plane at a specified height above the reference elevation datum extending to an outer boundary comprising:

(a) In the case of an airport with a single runway, semi-circular curves of a specified radius centred on the middle of each of the runway strip ends and joined tangentially by straight lines on each side of the runway, parallel to the runway centreline; or

(b) In the case of an airport with multiple runways, curves of a specified radius centred on the middle of each of the runway strip ends and the curves are joined by a tangential line as two curves intersect.

Approach Surface

The approach surface comprises an inclined plane or combination of planes that originate from the inner edge associated with each runway threshold, with two sides originating at the ends of the inner edge.

The inner edge associated with each runway threshold has a specified length, and is located horizontally and perpendicularly to the runway centreline, at a specified distance before the threshold.

The two sides diverge uniformly at a specified rate from the extended centreline of the runway.

The elevation of the midpoint of the threshold is the elevation of the inner edge.

Transitional Surface

The transitional surface comprises inclined planes that originate at the lower edge from the side of the runway strip (the overall strip), and the side of the approach surface which is below the inner horizontal surface, and finish where the upper edge is located in the plane of the inner horizontal surface.

The transitional surface slopes upwards and outwards at a specified rate and is measured in a vertical plane at right angles to the centreline of the runway.

The elevation of a point on the lower edge of the transition surface is:
(a) Along the side of the approach surface, equal to the elevation of the approach surface at that point; and
(b) Along the side of the runway strip, equal to the nearest point on the centreline of the runway or stop way.

NOTE: For the purpose of drawing the transitional surface, the lower edge of the transitional surface along the runway-strip is drawn as a straight line joining the corresponding ends of the approach surfaces at each end of the runway strip.

Take-off Climb Surface

The take-off climb surface comprises an inclined plane (or other shape in the case of curved take-off), located beyond the end of the runway or clearway.

The origin of the take-off climb surface is the inner edge of a specified length, located at a specified distance from the end of the runway or the clearway. The plane from the inner edge slopes upward at a specified rate, with the two sides of the plane originating from the ends of the inner edge concurrently diverging uniformly outwards at a specified rate, to a specified final width, and continuing thereafter at that width for the remainder of the specified overall length of the take-off climb surface until it reaches the outer edge which is horizontal and perpendicular to the take-off track.

The elevation of the inner edge is equal to the highest point on the extended runway centreline between the end of the runway and the inner edge, except that when a clearway is provided the elevation is to be equal to the highest point on the ground on the centreline on the clearway.

The OLS dimensions defined in MOS Part 139 are shown in **Table 8.3** for:
- A Code 3 Non-Precision Approach Instrument Runway (which apply to the current 05/23 Runway);
- A Code 4 Non-Precision Approach Instrument Runway (which would apply to a widened 05/23 Runway); and
- A Code 2 Non-Instrument Runway (which applies to the 14/32 Runway).

Table 8.3 MOS Part 139 Obstacle Limitation Surface Design Criteria

Runway	Surface	14/32 Runway	05/23 Runway	
		Code 2 Non-Instrument	Code 3 Instrument (Non-Precision) Current	Code 4 Instrument (Non-Precision) Future
Approach	CONICAL			
	Slope	5%	5%	5%
	Height (m)	55	75	100
	INNER HORIZONTAL			
	Height (m)	45	45	45
	Radius (m)	2500	4000	4000
	APPROACH			
	Length of inner edge (m)	80	150	150
	Distance from threshold (m)			
	Divergence each side	60	60	60
	First Section Length (m)	10%	15%	15%
	Slope	2500	3000	3000
	Second Section Length (m)	4%	3.33%	2%
	Slope	-	3600	3600
	Horizontal Section Length (m)	-	2.5%	2.5%
	Total Length (m)			
		-	8400	8400
		2500	15000	15000
	TRANSITIONAL			
	Slope	20%	14.3%	14.3%
Take-Off	Length of inner edge (m)	80	180	180
	Minimum distance of inner edge from runway end (m)			
	Rate of divergence (each side)	60	60	60
	Final width (m)			
	Overall length (m)	10%	12.5%	12.5%
	Slope	580	1800[a]	1800[a]
		2500	15000	15000
		4%	2%[b]	2%[b]

Notes:

a) May be reduced to 1,200 m if the runway is used only by aircraft with take-off procedure which does not include changes of heading greater than 15 degrees for operations conducted in IMC (Instrument Meteorological Conditions), or at night.

b) The operational characteristics of aircraft for which the runway is intended should be examined to see if it is desirable to reduce the slope to cater for critical operating conditions as specified in CAO20.7.1.B. If the specified slope is reduced, corresponding adjustment in the length of take-off climb surface is to be made so as to provide protection to a height of 300m. If no object reaches the 2% take-off climb surface, new objects should be limited to preserve the existing obstacle free surface or a surface down to a slope of 1.6%.

c) All dimensions are measured horizontally unless otherwise specified.

It will be noted that if the 05/23 Runway is ever widened from 30 m to 45 m (i.e. changes from Code 3 to Code 4), the OLS requirements for the Conical Surface height and the First Approach Section slope both change. The latter does not result in any change the OLS since the take-off slope is also 2%, and controls. In view of this, the airspace around the airport should be protected to preserve the 05/23 Runway Code 4C option through appropriate zoning and height limitations.

ICAO requirements for Obstacle Limitation Surfaces are identical to those for MOS Part 139.

The OLS plan for Broken Hill Airport based on the current runway configuration is shown in **Figure 10 in Appendix A**.

A large majority of the OLS plan affects areas outside of the Broken Hill Airport. As such, it is crucial that Broken Hill City Council takes responsibility for raising the awareness of the OLS to the general public and development proponents. Proposed developments within the airport confines will need to ensure compliance with the OLS. Any development outside the airport that includes elements that may penetrate the OLS should be referred to the Council for operational assessment.

Broken Hill City Council should give consideration to placing an airport overlay around surrounding areas to ensure that any building above a predetermined height are duly reviewed before the issuing of a planning or building permit to ensure that the OLS is protected.

9. Airport Development Strategy

9.1 Airport Development Works

This Section identifies the various facilities and infrastructure upgrades of the airport that may be developed in the short, medium or long-term future to meet forecast passenger and aircraft demand. The development strategy for each stage has been further categorised into airside, landside and terminal building projects.

9.1.1 Short Term Development (2008-13)

No major changes to current services are envisaged aside from the possible introduction of Virgin Blue EMB170 aircraft towards the end of the period. Accordingly, it is unlikely that any significant airside works will be required for RPT traffic.

Depending on future security legislation, there may be a need to enhance existing security requirements, including passenger and baggage screening.

The vacant land that is directly adjacent to the north of the GA facility has been identified as non-aviation and could be developed for commercial activities and either sold freehold or leased.

The works to be undertaken in the short-term are listed below.

Airside

No change to the airside parking is envisaged. The high forecast shows the introduction of jet aircraft at the end of the forecast period. This will require a remarking of the apron and operations will be on a restricted weight basis on the existing pavements.

Landside

- Provide additional car parking at the terminal.

Terminal Building

- Monitor and upgrade security requirements as required to ensure compliance with Federal Government security legislation.
- The existing terminal will be able to cope with the projected turbo-prop aircraft traffic within the given timeframe; however, an introduction of jet operations will trigger an upgrade of the security requirements (i.e. passenger, carry on luggage and checked baggage screening).

9.1.2 Medium Term Development (2013-20)

Development in this phase is expected to be dictated by any changes to airline fleets or route structures. If services continue to be provided by relatively small propeller-driven aircraft, no changes to the airside facilities will be required. However, provision should be included to undertake regular cyclic resurfacing of the 05/23 Runway, taxiway and apron pavements.

The terminal upgrading, if not already implemented, should proceed, and car parking capacity may need to be increased based on the increased traffic.

Further security improvements may be required including a requirement for all carry on and checked bag to be screened by X-ray and/or explosive detection.

The works to be undertaken in the medium-term are listed below.

Airside

- Design and construct asphalt resurfacing of the 05/23 Runway, and the taxiways and apron used by RPT aircraft.

- Continue development of GA taxiways and aprons as required depending on demand for take-up of GA lease area.
- Plan for the initial stage of the parallel taxiway to the 05/23 Runway, based on a needs requirement.
- Expansion of the RPT apron may be required to satisfy the busy hour peak. This will be airline schedule dependent.

Landside

- Provide alternative road access to the RFDS facility and bus parking.
- Increase car parking capacity and provide rental companies with designated areas and/or onsite service centre.
- Further development of landside infrastructure to the GA area.

Terminal Building

- Undertake terminal building expansion if not already completed.
- Implement checked baggage screening requirements (if required by legislation).
- Install baggage reclaim system for OH&S requirements.

9.1.3 Long Term Development (2020-28)

The works proposed in this time frame are entirely dependent on the nature of the traffic operating at the time. Assuming that the demand for air travel has increased sufficiently to warrant larger aircraft, general upgrading of all facilities may be required.

The works to be undertaken in the long-term are listed below.

Airside

- Provide part of the parallel taxiway to the 05/23 Runway, subject to justification by capacity/delay issues.
- Undertake further GA area development as required by demand, including new connecting taxiway between the GA apron area and the 05/23 Runway.

Landside

- Fully develop public car park to extended Terminal Building.
- Fully service GA lease areas.

Terminal Building

- Upgrading as required to suit passenger numbers.

10. Business Plan

10.1 Context

The Business Plan is a guide for future Broken Hill City Council action in the following areas:

- The development of the airport airside and landside facilities and infrastructure;
- Land use planning for aviation and non-aviation use on airport and adjoining lands; and
- The funding of Broken Hill Airport operations and future capital works over the next 20 years to 2027/28.

The primary objectives of the Broken Hill Airport Master Plan on which the Business Plan is based is to optimise the resource management of this significant regional asset by making the best use of airside and landside aviation infrastructure and vacant land, and to provide medium to long term benefits to aviation and the regional community.

The Broken Hill Airport Master Plan addresses airside and landside infrastructure, RPT air services, general aviation, aviation landside businesses, non-aviation landside businesses and land development. These focus areas are all related and in most instances share supporting infrastructure and utilities that all potentially contribute to the commercial success of the airport.

Broken Hill City Council is in the favourable position in having significant and well positioned land available for expansion to accommodate the introduction of jet services and also to grow the aviation and non-aviation businesses within the airport site. The timing of the introduction of jet services (if at all) is a threshold issue for the Council and will be subject to passenger demand, the availability of capital investment and community issues.

The approach in developing the Business Plan for the Broken Hill Airport is based on a number of important premises:

- The airport is not likely to receive any sort of significant funding from external sources for operations and development, and therefore Broken Hill City Council, as owner and operator, has to make provisions for such development from existing and/or prospective sources of airport revenue, including possible partnering with other companies or institutions;
- How the airport is to be developed and how best use of the land is to be achieved should be driven by commercial and demand considerations; and
- The airport development has to benefit aviation and the Broken Hill regional catchment both economically and socially. Where possible, the risk should be borne by all the major beneficiaries of the airport development in the region and not just Broken Hill City Council in its role as owner/operator of the airport.

Over the life of the master plan, Broken Hill Airport has the potential to experience a major expansion in airside infrastructure including terminal upgrading, runway strengthening, and associated taxiway and apron developments as part of a move to larger aircraft and/or jet operations.

The airport site could also realise significant expansion in aviation and non-aviation businesses.

This level of development at Broken Hill Airport over the period of this master plan is conditional on how Broken Hill City Council adopts the capital investment program within this Business Plan.

For the Broken Hill region, the range of potential economic benefits may include:

- Increased aviation industry development;
- Enhanced RPT air services that will promote the existing business and tourism sectors;
- Increased aviation industry activity at the airport;
- Increased demand for business and goods and services (i.e. new tourism establishments, restaurants, manufacturing, commercial, transport, etc);
- Greater rates base and diversification of industries; and
- Increased employment and income.

Collectively these local and regional benefits that may result from the implementation of the Broken Hill Airport Master Plan will make a significant contribution to Broken Hill region to 2028.

10.2 Expenditure Forecasts

Expenditure forecasts have been developed to 2028 for the Low, Medium and High growth scenarios of passenger movement forecasts and aircraft movement forecasts.

10.2.1 Capital Expenditure Cost Estimates

Indicative cost estimates exclusive of GST and contingencies have been prepared for the short, medium and long-term works and these are presented in **Table 10.1**. All costs are at current 2008 dollar values with no provision for cost escalation in the future.

If all the capital works were implemented between 2008 and 2028 it is estimated that the capital budget would be approximately $22.5 M (in 2008 prices).

Table 10.1 Capital Works Indicative Estimates – Short, Medium and Long Terms

Short Team (2008 to 2013)	Indicative Sums
Airside	
Strengthen existing RPT apron and remark bays to suit new aircraft configuration.	$800,000
Terminal	
Baggage Handling System with the introduction of Checked Bag Screening	$500,000
Make-up loop (option)	$70,000
Minor building works to accommodate BHS/CBS and make up loop	$250,000
Carry on x-ray machine, walk through metal detector and hand held detectors	$180,000
Reconfiguration of check-in with the introduction of check in scale conveyor and transport conveyor up to the x-ray machine	$150,000
Landside	
Sub-division (non-aviation) north side of GA	
Road works	$800,000
Services – upgrade water main, street lighting	$1,600,000
Medium Term (2014 to 2020)	**Indicative Sums**
Airside	
Resurface 05/23 Runway, taxiways and aprons	$7,000,000
Expand RPT apron to accommodate three Code C Aircraft	$2,300,000
Terminal	
Further improvements to terminal foot print i.e. increase holding lounge and passenger services	$350,000
Internal facilities	$80,000
Landside	
Carpark improvements from current 200 spaces – security lighting	**$500,000**
Secured carpark area – boom gates	**$90,000**
Extend carpark to include rental service facilities Areas for lease to car rental company Lighting	$400,000
Services	$500,000

Long Term (2020 to 2028)		Indicative Sums
Airside		
New parallel taxiway to 05/23 Runway		$4,300,000
GA Upgrade	Optional	
Apron		
Services		$1,500,000
Terminal		
Further improvements Ongoing terminal upgrades with the introduction of larger aircraft i.e. A321 i.e. Enlarge holding lounges		$300,000/$500,000
Landside		
Further extension to car park – Additional car park spaces (optional)		$500,000

11. Management Plan

11.1 Background

Broken Hill City Council has resolved to consider alternative management and operation arrangements.

11.2 Management Options

In considering possible governance structures for Broken Hill Airport, the Council needs to decide whether it desires to retain its in-house structure, an "arms length" but controlled structure, or a totally independent structure. The political philosophy of the Council in relation to service delivery is likely to be a significant determinant of the governance structure model to be adopted.

Research has identified that there are a range of possible governance models/structures suitable for the airport. These include:

- Council Department;
- Business Unit;
- Council Organisation (trust); and
- Independent Organisation (company).

In respect of identifying possible advantages/disadvantages of options the following matters have been considered:

- The implications of legal status;
- The relationship between the airport business and the Council;
- The funding sources and their continuity;
- Accountability arrangements;
- Transparency of use of public funds;
- Efficiency and effectiveness; and
- Relationships with industry stakeholders.

11.2.1 Option 1 - Council Department

This option involves establishing a division, department, section, team or unit (not commercialised) within the Council departmental structure that is dedicated to the specific role of managing and operating the business of the airport. Ultimately, this organisational unit will be accountable to the Chief Executive through the normal management hierarchy. The organisation level of the unit is likely to be directly related to the importance of the airport to the local authority. In the case of Broken Hill Airport, the business of operating the airport is important to the region, but is not at this stage a significant business entity within the Council.

Such an organisational unit will not have an independent legal identity as it is part of the Council. The unit may, however, have a unique branding.

The unit can be established through the action of the Council, since it is able to determine the internal management structure of the local authority organisation within the parameters of the Local Government Act and any specific policies that the Council may have established.

Consideration needs to be given to the functional grouping and level within the Council where the Broken Hill Airport Unit will be established. It is likely that a unit would operate in a position subordinate to the major functional groupings of the Council structure.

The outputs to be delivered by a Broken Hill Airport Unit may be established in the Council's annual plan, but because these are generally of a high level it may be more appropriate for the unit to have its own, more detailed annual business plan.

11.2.2 Option 2 - Council Business Unit

This structural option is a variation of the Council Department option and the distinction between the two is not great.

In general, a business unit is an accounting and management concept representing "commercialisation" of the way in which the local authority undertakes an activity or delivers a service.

The main characteristics of a business unit are:
- Semi-autonomous management;
- Commercial operation; and
- Primary objective of recovering costs or making a profit.

A business unit is part of the local authority's organisation and is not a separate legal entity. It is, therefore, subject to the same statutory provisions and local authority policies.

The concept envisages a business unit as having greater operational freedom than in-house Council departments.

A business unit may have its own brand identity.

The common reasons for establishing business units are:
- The implementation of a purchaser/provider model within the local authority;
- A more transparent and commercial approach to delivery of services while retaining control within the local authority; and
- Evaluation of the need for continued local authority direct involvement in an area of service delivery and possible transition to an arm's length structure.

The use of business units is a means of separating a local authority's specified/purchaser functions from service delivery/provider functions with services being provided by the business unit on a documented and clearly specified basis for an agreed level of funding (i.e. service price).

In general, when they establish business units to deliver services, local authorities should ensure that they:
- Are clear about their objectives;
- Set realistic and attainable goals;
- Establish appropriate policies governing the delegated authorities of the business unit;
- Maintain a balance of control and autonomy to allow the business unit to operate in a commercial manner; and
- Establish an appropriate accountability framework for the business unit.

The minimum basis of accountability for a business unit should be an annual business plan which contains at least the following information:
- Statement of purpose;
- Assessment of the market in which it operates;
- Outputs to be delivered;
- Operating philosophy and strategies to be implemented;
- Financial budgets; and
- Performance measures and targets.

The use of the business unit model is likely to be appropriate for a business operation that is a major component of a Council's economy and a local authority is heavily committed to directly promoting and supporting the business. The business unit model allows for a more "commercial" style of in-house service delivery with appropriate branding and is likely to be more commercially effective than a Council Department.

11.2.3 Option 3 - Council Organisation (Trust Structure)

A local authority may establish an organisation to undertake a function or deliver a service on its behalf. In this sense, an organisation is defined as any partnership, trust, arrangement for the sharing of profits, union of interest, co-operation, joint venture or other similar arrangement.

There is a significant difference between a company and a trust. Although both have a legal identity separate from those persons who established or manage them, a company has a power of general competence. A trust, however, is legally empowered to do only those things specifically provided for in its trust deed. This may be restrictive and trustees are usually careful to ensure they do not exceed their legal authority and incur personal liability. Hence, trusts are generally regarded as a suitable vehicle to hold and manage assets while companies are better for providing services on a commercial basis or undertaking extensive trading operations for trading purposes.

11.2.4 Option 4 - Company

A company is a separate statutory legal entity which can carry on business in circumstances that the owner(s)/shareholder(s) are not regarded as carrying on the business personally or in partnership. The shareholder(s) do not have personal liability for the actions of the company and have therefore "limited liability", except to the extent that they may hold shares in the company that they have not fully paid for. A company is incorporated and operates under the terms of the Companies Act. The shareholders, which may be one or more local authorities, possibly in conjunction with the private sector, provide the capital of the company in return for equity securities (usually voting shares). Shareholders approve the company's constitution and appoint directors. The company's Board of Directors governs the company, appoints its managers and is accountable to the shareholders.

11.3 Comparison of Management Options

Table 11.1 provides a comparison of the proposed airport management models.

Table 11.1 : Comparison of Airport Management Models

Feature	Council Department	Business Unit	Company	Council Organisation (Trust)
Legal status	Part of local authority.	Part of local authority.	Independent entity with strong governance linkages.	Independent entity with very strong governance linkages.
Managerial independence	Subject to local authority's policies.	Subject to local authority's policies but likely to be more "commercial" and flexible.	Able to operate commercially without excessive bureaucracy has power of "general competence".	Able to operate commercially but controlled by trust deed.
Funding implications	Substantially reliant on local authority funding.	Substantially reliant on local authority funding but may manage other revenue earning businesses.	Reliance on local authority funding but can trade freely to source alternative revenues.	Reliance on local authority funding but can trade freely to source alternative revenues. May be more likely to receive industry financial grants.
Governance implications	Governed by local authority and possibly a committee. Accountable within local authority structure.	Governed by local authority who may appoint an advisory board. Independently accountable through local authority structure.	Governed by own board appointed by local authority. Subject to statement of intent and other specific accountability requirements.	Governed by trustees who may be appointed by local authority. Subject to statement of intent and other specific accountability requirements.
Transaction arrangements with local authority and costs	Annual plan/business plan applies. Very low transaction costs.	Annual business plan and internal service agreement applies. Low transaction costs.	Service contract. Modest transaction costs.	Service contract. Modest transaction costs.
Relationship and stakeholders	May not relate well. Stakeholders have no input to governance.	Stakeholders may be able to input advisory board but no governance role.	Can relate well. Stakeholders can nominate directors.	Can relate well. Stakeholders may have appointment rights.
Compliance costs and taxation	Minimal compliance costs and no taxation implications.	Minimal compliance costs and no taxation implications.	Significant compliance costs (e.g. separate audit). Subject to taxation.	Significant compliance costs (e.g. separate audit). Subject to taxation.

11.4 Privatisation

As an alternative, to the above, Council should also give due consideration to divesting the airport in whole or part. This would be subject to government land purchases and sale regulations and may also require complying to federal legislation in relation to previously owned federal assets.

Under the privatisation options there are two models:

11.4.1 Model 1

Sell off the entire airport site with existing leases/business and take a one off cash payment. Under this model, Council will divest all interest in the airport an have no further involvement except as a key stakeholder.

11.4.2 Model 2

Lease the land and assets for 49 year lease with a 50 year option similar to the federally leased airports. This option provides a one off cash payment (smaller than Option 1) and provides an airport operator. Under this option Council can set key criteria for the new operator such as improve the assets, grow the business. A private operator will most likely be able to develop the non-aviation land more effectively which in turn will add growth to the City of Broken Hill.

This option should also allow the operator to on sell.

11.5 Preferred Management Option

The preferred model of management will be subject to Council's consideration after a due process has been followed and stakeholder consultation undertaken.

Given that it is such an important issue for both Council and the community, a detailed business case should be undertaken to explore the options further before making any recommendations to Council.

12. Marketing Plan

The following marketing plan offers initiatives which could further unlock the potential of Broken Hill Airport with respect to scheduled air services, general aviation and land development perspectives.

Broken Hill Airport needs to diversify its revenue base and reduce its dependence on passenger landing aviation fees. This could be accomplished through a greater focus on attracting aviation and aviation support industries, land development and growth of complementary businesses.

Revenue and expenditure concerns which face the airport include:

- Scheduled air services are currently restricted to Rex;
- Limited ability to increase revenue from aviation and airport rates and charges;
- General airport operating costs which do not vary significantly as aircraft and passenger activity increases or decreases;
- Potential for increased security costs; and
- Uncertainty about insurance costs in the aviation sector nationally and worldwide.

As has been the case over the last decade with the privatisation of former Federal Airports Corporation airports, the rise and/or fall of domestic airlines, and the introduction of Low-Cost Carrier airlines, substantial changes may be expected in the short to medium term in domestic aviation market and the corresponding level of scheduled air services in the region. Therefore, airport planning for the future should stress flexibility at all times.

One of the aviation related opportunities is the potential to further develop the aviation business aspects at the airport. Currently, these are focused around the maintenance and storage activities of the GA services, flying training activities associated with the Aero Club, and home based and a small number of visitor general aviation traffic. Therefore, the airport has an excellent opportunity to pursue this market segment with a view towards capturing any potentially displaced activity, by offering high quality facilities at lower costs. This and the increased activity flowing from the air park precinct discussed in Section 12.3.1, would give Broken Hill Airport a much more viable critical mass of home based aircraft.

In turn, this would be expected to provide spin-offs for the existing operators such as increased maintenance activity and fuel sales, and potentially create a demand for expansion and perhaps new operators to enter the market. Organic growth in flying training activities, which could be provided by commercial operators as well as the Aero Club, would be expected to occur as aviation activity increases. Catering to the needs of both fixed and rotary wing operations would provide further business opportunities. The master plan affords the opportunity to locate fixed and rotary wing activity to minimise operational conflicts.

12.1 Marketing to the Airlines

12.1.1 RPT Services

The key to Broken Hill Airport's future from a scheduled air services perspective is making air travel more affordable to the permanent population in and around Broken Hill region, while retaining existing service levels and also using scheduled air services to generate tourist visitations to the region as a stimulus to further economic development.

Currently, Broken Hill is only serviced by a single airline – Rex. Clearly the current level of demand does not justify a second operator on current routes; however there may be opportunities for other airlines on new (non-competing) routes. Intrastate travel within New South Wales is regulated by the New South Wales Transport Department and any new intrastate services would require the Department's approval.

QantasLink, as a second potential regional airline should be approached to assess interest in operating to Broken Hill. QantasLink currently operates Melbourne to Mildura and it would be logical to offer some connecting services to Melbourne.

The future of Broken Hill Airport from a scheduled air services perspective is therefore dependent on the airline currently servicing Broken Hill and any additional airlines (new or existing) which can tap into the potential of the region.

12.1.2 Low-Cost Carrier Services

The introduction of Low-Cost Carrier services in Australia is built on servicing ports with a relatively large population base, big passenger volumes, operational cost-cutting by the carriers, the adoption of online booking, and the realisation by the travelling public that flying is no more special than catching a bus or a taxi.

The Low-Cost Carriers concentrate on discretionary tourist routes, but the crucial thing is not how much lower the fares go, but how many seats they make available at the lowest prices. The domestic airline industry has changed dramatically, with low fares reshaping the travelling public's habits. The theory is that lower fares must inevitably create a self-feeding demand for air travel – especially on the more lucrative leisure-focused routes – from travellers who will take to the air either more often or even for the first time simply because it is so cheap. Putting it simply, the more cheap fares that are in the market, the more likely Australians are to travel domestically.

The Low-Cost Carriers expect to create shifts in modes of transportation by encouraging people to consider air travel instead of buses and rail. Competitive airfares and increased frequency of flights will most likely stimulate latent travel demand. However, for the long-term survival of any Low-Cost Carrier, the pricing must be sustainable. Travelling by air is now a matter of price over loyalty, taking a short air package holiday being no more costly than driving to the coast for the weekend.

The success of low cost airlines derives from a focussed business model that is optimally tailored to meet the needs of air travellers who want to reach their destinations cheaply and efficiently. The business model generally has three key elements:

- A simple product (i.e. no meals, no frequent flyer program, etc);
- Aggressive pricing and marketing positioning that directly target leisure travellers and price conscious business travellers by offering frequent point to point services; and,
- Low operating costs and sales commissions with high productivity and higher margins than existing participants in the same market.

Overseas, low cost airlines have demonstrated an increasing tendency towards exploiting unmet demand for lower priced services. Therefore the low cost airline typically results in a decline in fares and a larger increase in the overall market size.

Generally air travellers as consumers are no longer captive to a full service airline such as Qantas, and have both price and service options and know how to use the internet to source the best deal.

In particular, Broken Hill's potential to provide access to the "outback", either as a one-stop destination, or as a port on a multi-stop tour (perhaps linking with Alice Springs and/or Longreach, for example) should be highlighted.

In this regard, a business case could be developed by the Council in conjunction with the main tourism agencies and neighbouring Councils, highlighting the significant potential of the region to a low cost airline.

Jetstar

Qantas commenced the new stand alone low cost "lean highly competitive" domestic airline Jetstar in May 2004, with the objective of further enhancing the flying services operated by the Qantas group including the regional operations of Qantaslink. The target market for Jetstar is the domestic leisure market which Qantas believes is growing rapidly and now presents over 60% of all passengers.

Council should arrange to meet with Jetstar executives to canvas the potential of Jetstar operating direct services from to Broken Hill (potentially direct services from Melbourne and Sydney) with more seats available at lower and less complicated fare structures.

It is noted that Jetstar has a fleet of A320 aircraft each with 177 seats and hence would potentially provide a jet rather than turbo-prop aircraft service. Expanded schedules and direct interstate services to and from Broken Hill Airport may provide the leisure, business and tourist traveller with a wider choice of services and fare options.

Virgin Blue

Virgin Blue was the catalyst for the growth in domestic aviation in 2002/03 with the introduction of new direct services in 2001/02 including on the Gold Coast-Melbourne and the Sunshine Coast-Sydney routes. These services have effectively taken connecting (i.e. transiting) passengers away from the major capital city airports and have provided faster direct services.

Virgin Blue has been targeting cities/regions with large populations and with significant tourism. The Broken Hill region does not have these attributes, and is unlikely to attract Virgin Blue operations until a significant boost in tourism demand is generated. In general terms, cities with populations less than about 30,000 to 40,000 people are generally below Virgin Blue's target size unless the destination also supports significant tourist traffic.

Virgin Blue does not operate as just a trunk carrier, and has taken steps to put jets into regional areas that previously did not have jet operations, as evidenced by the introduction of the smaller EMB 170 and EMB 190 aircraft. Virgin Blue is continuing to look at other services into areas that traditionally were only getting turbo-prop aircraft (for example, Port Macquarie).

Virgin Blue does not actively approach airport owners to expand their airside infrastructure, but does seek to co-operate with airport owners who believe that passenger demand could be expanded by the introduction a new airline in the local market (e.g. Hervey Bay). Virgin Blue indicated that any airport handling more that 150 passengers per day may be of interest. The Virgin Blue model is to stimulate demand through lower and more competitive fares than its rivals particularly at the leisure end of the market.

Tiger Airlines

Tiger Airlines commenced as new stand alone low cost domestic carrier airline in October 2006. The target market for Tiger is the domestic leisure market along the east coast of Australia.

Council should arrange to meet with Tiger Airlines executives to canvas the potential of Tiger operating direct services from to Broken Hill (potentially direct services from Melbourne and Gold Coast) with more seats available at lower and less complicated fare structures.

Tiger Airlines has also introduced the smaller A319 to compete on the smaller thinner routes with Virgin Blue's EMB 190 aircraft.

12.2 Marketing Tourism

The tourism potential of the Far West NSW is significant and domestic and international visitors should be vigorously targeted. It is understood that Broken Hill Council has an active tourism marketing strategy.

12.3 Marketing to the Aviation Industry

12.3.1 Aviation Businesses Requiring Movement Area Access

Escalating prices and aircraft operating costs have seen the rate of general aviation growth develop in line with growth in general economic activity. The current Global Financial Crisis has again seen an impact on the increase number of aircraft for sale and reduction in hours flown in the industry. The most heavily hit is the flying area, in particularly the overseas students.

General Aviation Prospects

General aviation and general aviation support industries are not well represented at Broken Hill Airport, primarily due to its remote location.

General Aviation generally falls into the following activities:

- Private flying – including the use of an aircraft for personal transport or flying for pleasure, recreation or sport, but not including business or aerial work or common carrier for hire;
- Business flying – involving both an individual piloting an aircraft in order to conduct business and the transportation of company personnel or clients in a corporate aircraft flown by professional pilots;
- Flying training – including any use of aircraft for the purposes of formal instruction for issue or renewal of a pilot licence or rating;
- Aerial work – including community services (i.e. Flying Doctor, air ambulance, aerial fire fighting, flood and disaster relief, search and rescue, aerial mapping, photography and surveying);
- Highway, pipe and power line patrolling;
- Aerial advertising;
- Tourism – including sightseeing tours, flights and parachuting;
- Agricultural aviation – including using an aircraft to spread seeds and fertilisers and to apply chemicals to control pests and disease in crops;
- Test and ferry – including the flying associated with testing an aircraft or with its delivery or movement to another location for maintenance, hire or planned use;
- Charter – including the hire of an aircraft and pilot to transport passengers and/or goods on non-scheduled services;
- Sport and recreational flying – including the use of autogyros, hang glider, paragliders, microlights, ultralights and parachuting

General Aviation flying usually attracts a range of ancillary/support industries to the airports from which GA aircraft operate. For example, GA aircraft are required to be serviced approximately every 100 flying hours. This activity can cost between $800 and $1,500 per 100 hours of service (excludes rectifications and engine overhauls) depending on the aircraft type. Therefore the larger the local GA aircraft fleet based at Broken Hill, the greater will be the range of general aviation support activity in not only maintenance but in aviation support activities.

Typical support activity includes:

- Line services – fuelling and sale of lubricants;
- Aircraft storage;
- Aircraft maintenance – major repairs and reconstruction, minor repairs, airworthiness inspections;
- Engine maintenance;
- Avionics – sales and services;
- Aircraft sales and rentals; and
- Parts sales and services.

The GA businesses at Broken Hill Airport are co-located at the north-eastern end of the airport and comprise the following:

- Broken Hill Aviation Pty Ltd;
- Broken Hill Aero Club;
- Flying Patrol Ministry;
- Barrier Air Taxi Services – Corner Country Air Services; and
- Airservices Australia.

A small fleet of GA aircraft are permanently based at Broken Hill Airport and these support activity for fuel companies, aviation maintenance and aircraft storage. As these are limited with the possible introduction of i.e. an air park could generate increase in these services and thus providing the formula to expand with the likelihood of introducing other related aviation services.

On the above evidence, there appears to be considerable upside potential in developing the General Aviation sector at Broken Hill Airport.

General Aviation aircraft owners, particularly those engaged in non-commercial operations will be likely to make their base at or utilise airports with low or no aeronautical charges in order to reduce the costs associated with flying. Broken Hill City Council currently has in place a fee for all aircraft types landing at the airport. In order to attract aircraft to be based at the airport, this policy should be reviewed.

There are a growing number of council owned airports around the country that no longer charge airport landing charges for GA. This is based on the fact that when they visit a city they provide some multiplying factor to the economy, i.e. buy fuel, take a taxi to town, stay over night etc. Large regional cities such as Bendigo and Latrobe Valley removed landing fees many years ago. Temora, Swan Hill and Echuca are examples of regional towns with no landing fees.

Since the ownership of the unallocated airport land is held by Broken Hill City Council, it would be sensible for a coordinated and integrated strategy to be adopted across the business groups in Council to maximise the development benefits.

Aviation businesses which require movement area access and other aviation support businesses which could create a cluster effect at the airport should be located in designated land at the airport.

Realistically, the vacant airport land with immediate movement area access would appear to meet Broken Hill Airport's short to medium term requirements considering the current level of utilisation and demand for general aviation and other commercial aviation business activity.

If the aim is to protect airport land for future aviation industry use over the longer term, 20 years and beyond, a similar parcel of land to the immediate south-east of the existing GA area land could be preserved. The parcel of land has limited strategic benefit to the airport and it would be in Council's commercial interest in the short to medium term to sell this land if the right opportunity presented itself.

The major issue that confronts Council is how to make this airport development happen.

Aircraft Storage Prospects

With the current economic downturn and the flow on effect to the aviation industry, several airlines and aircraft operators in Australia have placed some of their aircraft into short term storage. Broken Hill due to its dry climate and distance from the sea would make an ideal storage area. Should such an opportunity arise for Broken Hill Airport such storage may be accommodated on vacant land within the airport boundary, depending on the number of aircraft, size and the required area for such parking/storage.

The aircraft storage area could also support aircraft decommissioning and aircraft salvage in the form of recycling aircraft components and aluminium.

The size of the aircraft will be determined by the existing or upgraded infrastructure, (ie runway and taxiway capability).

Air Park Opportunities

Another of the aviation related opportunities to develop Broken Hill Airport is the potential to develop an air park precinct at the airport. Air parks which originated in America are now being developed in Australia. Air parks provide aircraft owners with the opportunity to build a residence and aircraft accommodation hangar on the same land parcel within a single building. Traditional landside access (vehicle and pedestrian) is provided on one side and airside access from the hangar to a taxiway is provided on the other. Air parks are now becoming established in Australia with Temora and Narromine which are both in NSW, serving as successful examples in the Australian context.

The Broken Hill Airport Master Plan identifies a possible precinct area of land at the north-eastern end of the abandoned 07/25 Runway as an appropriate location for the Air Park Precinct. This area has a number of advantages:
It is contiguous to the existing GA area, which provides ground access and engineering services connections;
Being at the far north-eastern end of the airport and substantially self contained, it can be specifically configured to respond to the new security requirements.

Given that the vast majority of general aviation aircraft fall within Code A dimensions it is considered appropriate to adopt this as the design aircraft for the air park facility. This encompasses the range of Cessna, Piper and Beech singles and light twins, and those of many other manufacturers as well as the emerging recreational aviation class of aircraft.

Landside road connections are assumed to be sealed and conform in all respects to Broken Hill Airport requirements for residential subdivisions.

12.4 Marketing to the Non-Aviation Industry

12.4.1 General Aviation and Aviation Support Businesses

A relatively straight forward way to market the general aviation and aviation support opportunities at Broken Hill Airport is by developing a feature advertisement which would in turn be placed in the three to four major national aviation publications, namely:

- Australian Aviation;
- Aviation Business;
- Australian Flying;
- Pacific Flyer; and
- Aircraft and Aerospace.

All of the above have advertising costs of around $1,600 for a casual insert of a half page and $2,400 for a full page colour advertisement (excluding design costs).

The monthly Australian Aviation has the largest circulation with 15,700 subscribers/purchasers and over 33,000 readers. Most importantly, this magazine is the official organ of the following peak aviation groups:

- Australian Business Aircraft Association (ABAA);
- Association of Australian Aerospace Industries (AAAI);
- Guild of Air Pilots and Air Navigators (GAPAN);
- Helicopter Association of Australia (HAA); and
- Regional Aviation Association of Australia (RAAA).

A less targeted approach would be to place Expression of Interests advertisements in the Tender and Opportunities section of the Daily Telegraph and The Australian (Friday's edition has a dedicated Aviation Supplement).

Both the above advertising medium would provide some immediate indication to Council of the possible demand for airport land and maybe other broader commercial/industry opportunities for the remaining vacant land which is earmarked for development over the next 10 to 20 years.

12.4.2 Other Industrial/Commercial Development

The undeveloped vacant airport land has considerable commercial potential to the Council and to the airport. Notwithstanding, there are a number of regional airports with similar parcels of undeveloped land awaiting interests from prospective developers.

Successful airport development requires available land, the demonstrated need for the development to occur, the financial capability of the proponent to complete the desired project and a supportive community. An airport has the ability to attract new businesses and new lessees, which increases and diversifies the airport's revenue stream, provides increased revenues to the airport owner, and most importantly increases the employment base of the local economy.

Four attributes are essential for attracting development opportunities:

- Physical dimensions of the vacant land (sufficiency of land size for considered use);
- Infrastructure required to support considered use;
- Appropriate zoning and/or compatibility with land use restrictions (i.e. aeronautical versus non-aeronautical use); and
- Political factors (support of local authority and community).

If each of these attributes is favourable to development, or can be made favourable through change, then a land market study is then considered as a cost-effective way to determine if a demand for the vacant airport land exists. The objective of such a market study would be to determine the highest return and best use of the land and whether immediate and future demand exists for the land.

It is quite conceivable that a developer could express interest in a parcel of land at the airport which the airport owner then reactively acts on without understanding the possible broader demand for such land. This leaves the local authorities as the owner of the airport vulnerable to spending time and money on the land development project if the deal falls through or allowing a parcel of land to be developed that turns out not to the in the best interest of the airport.

A proactive cost-effective initiative to test the waters could be for Council to commission a nationally prominent industrial property development consultant to conduct a market study of the vacant airport land. A market study targeting the key markets of Brisbane, Sydney and Melbourne would cost around $20,000 to $25,000.

The results of such an initiative would conclusively determine the quantum and commercial nature of short to medium term demand for the airport land. In addition an airport land market study can provide a higher level of confidence to Council when moving forward to develop the airport land. The study could take into account the following:

- Markets particular strengths and weaknesses;
- Regional and national trends in industrial land take-up;
- Identification of prospective developers and considered uses; and
- Advice on revenue mix and land design mix to ensure aeronautical and non-aeronautical development are appropriate and sequenced to align with the airport land use plan (including infrastructure support).

The fundamental decision confronting Council concerning the timing of developing the vacant airport land should be made following the conduct of the airport land market study and the possible identification and analysis of development options for the vacant land.

While it is unknown what the level of developer interest in the vacant airport land will be identified through an airport land market study, the possible returns to Council could be significant if the vacant land can be progressively and proactively developed and/or sold by Council over a 10 year period.

Activities which may be potential candidates for the Non-Aviation Business Precinct could be as follows:

- A factory and clearance outlet complex, which would be quite separate from standard retailing complexes within the Broken Hill Airport surrounding area;
- Superstores, across a range of activities including hardware, personnel services, etc;
- Tourism and hospitality activities, including tourist facilities requiring large sites, (although these may not be large employment generators) hotels and fast food outlets (supporting an air park):
- Sport and recreation activities, including an indoor stadium or gymnasium; and
- Services trades, particularly relating to the aviation industry and or the building trades.

The precinct offers location advantages for activities which draw from district and local catchments. Other comments that could be made in relation to potential uses for the precinct are as follows:

- The range of potential activities that could be attracted to the site in the short term is quite diverse, with each activity having substantially different site requirements;
- Some of the likely candidate uses are potentially quite large developments which could manage relatively high site development costs such as land fill. Other uses would be quite sensitive to establishment costs (i.e. service trades) and may need to be accommodated as part of a large integrated development;
- There are clearly a host of economic opportunities that cannot be foreseen at this time. These may include footloose activities that find some advantage in locating in the precinct. Availability of quality development sites will help attract such activities. Depending on the nature of such activities they will be seeking some or all of the following attributes:
  - relatively inexpensive land;
  - readily serviceable sites;
  - medium - high exposure/accessibility; and
  - medium – high amenity.

The implications for the future development of the precinct are as follows:

- It provides opportunity for a distinctive centre which can cater for both large scale and new forms of retailing, not found in traditional centres, together with wide range of uses that are unsuitable for or do not require a location within a traditional centre;
- The need to determine which parts of the precinct would best be suited to the different types of activities identified. This should be based on consideration of the scale of activity, the intensity of the site development and whether or not the activities require a higher or lesser level of amenity and exposure;
- The need to provide for a range of allotment sizes that cater for mix of businesses including those identified above; and
- The need to consider the urban design issues associated with the nature of uses envisaged. Retail showrooms and superstores are basically ‘big boxes’ and their appearances and relationship with other activities need careful consideration.

12.4.3 Airport Land Development Models

Land with Airside Access

The development models which are offered below will be influenced by the proximity of vacant land to airside aviation infrastructure. In this regard, Council should ensure the long term preservation of such land for future aviation industry development activities. The development models for such are as follows.

1. Council as the Planner, Promoter, Developer and Manager (through leases)

- Proposed development of airside vacant land in accordance with the Airport Master Plan;
- Council as owner of land, develops land to support aviation industries which require airside access;
- Council promotes and markets the land to prospective clients;

- Council uses lease transactions to secure tenants thereby retaining management control of the leased land;
- Council retains full control over the siting of aviation activities at the airport and mitigates against a business from aggregating sites and dictating the future of the airport's development in terms of the mix of business activities; and
- Leased sites will provide an ongoing revenue stream to Council over the life of the lease.

2. Council as the Planner, Promoter, Developer and Freehold Seller of Land

- Council develops and promotes the freehold sale of vacant land with airside access in accordance with the requirements of the Broken Hill Airport Master Plan;
- Land sales can be transacted with 2nd party requiring land for a specific aviation needs and/or to a 3rd party who then subdivides and sub leases (or sells) the land;
- Freehold makes it easier for developers to secure finance to acquire land and expand business over time;
- Freehold titling would definitely facilitate the attracting of new businesses to the airport;
- Council would receive lump sum proceeds from the progressive land sales;
- Council would not incur ongoing costs associated with the administration of leases; and
- Council would have a ready source of funds which it could allocate for airport development and maintenance activities.

Land with No Airside Access

Land parcels could be developed and occupied for the full range of industrial and commercial activities that are not necessarily aviation industry activities. Such activities would need to comply with the Broken Hill Airport Master Plan, Obstacle Limitation Surfaces and Building Height restrictions for the airport surrounds. Generally there is no need for the airport owner to preserve these parcels of land given that they have no significant direct access to airside aviation infrastructure.

The preferred development models for these parcels of vacant land are ranked in the following order.

1. Council as the Planner and Seller of Land

- Council has no large up front capital costs for developing the parcels of land, no ongoing maintenance and property management costs and no active marketing of the property to prospective tenants;
- Council obtains a lump sum or staged payments depending on the terms of the sales contracts;
- The private sector party can sub lease land or develop customised facilities to meet specified tenant's needs;
- Simplistically, the private developer assumes the commercial risk and the resourcing to develop the parcels of land; and
- Potential for the land to be developed more proactively in a discrete package by the private sector party resulting in broader benefits including increased Council rates base, increasing in local employment and building upon existing industry and commerce.

2. Council as the Planner, Promoter, Developer and Freehold Seller of Land

- Substantial up front development costs are borne by the Council and are only offset through progressive sales of land over time;
- Council would need to conduct market studies to identify future demand and prospective tenants;
- Council assumes commercial risks;
- Airport land sales proceeds therefore would be dependent on the extent and will of Council to independently market and sell the land vis-a-vis other Council industrial estates; and
- Council rates base and other broader community benefits (that is increased employment base and synergistic opportunities with other industrial and commercial activities in the region) may not occur in the same timeframe as a private sector development.

12.5 Marketing to the General Public

Broken Hill Airport currently has a reasonable profile as a scheduled air services airport and as a centre for GA activities. To support any marketing activity, there needs to be publicly available print promotional material and also significant work done on the web site.

The web site has become the business brochure for the modern era. The informed internet buyer of today always checks a business web site before conducting business with that company. A poorly designed web site can send potential customers to another company.

Basic guidelines for the development of a suitable web site for development at Broken Hill Airport include the following:

- Have the site professionally designed and maintained, or have a pathway constructed so that the Airport Manager or staff can maintain and update the web site as needed.
- Include the following sections:
  - Basic airport information including maps, runway lengths, widths, strengths, navigation aids, automated weather reporting, plus hours of operations.
  - Airport operational information including annual and monthly operations.
  - Directions to the airport and an airport map.
  - Airport business directory with links to the Airport Manager's name and contact data.
  - Public relations information including press releases and fact sheets.
- Other 'value added' information can include:
  - Community section featuring fun facts about the airport, interesting aircraft, fly-ins or upcoming events (air shows, open houses).
  - Development information including available property, standard lease rates, hangar availability and an aerial photograph.
  - Information on the economic benefit of the airport (if applicable).

12.6 Implementation Plan

The preceding analysis points to key conclusions and actions that should be employed over the short term at Broken Hill Airport and to unlock the development potential of undeveloped airport land.

The key conclusions are:

- Broken Hill Airport has a potential market disadvantage because it does not offer jet or Low-Cost Carrier services together with the attractive airfares and schedules which they may provide to air travellers to and from the region.
- Broken Hill Airport is served by turbo-prop aircraft at a time when air travellers are expecting that jet services be used. Regional jets will be the aircraft of choice for airlines as Virgin Blue and Jetstar seek in the future to add capacity (i.e. additional services, new non stop services etc) in medium sized markets.
- The extent of general aviation and aviation support industry activity at Broken Hill Airport does not match the high quality of the airport infrastructure which is evident at Broken Hill Airport and which could be required in the future to service the aviation sports and GA air charter activity commonly associated with a major tourist destination.
- The potential demand of vacant airport land including the possible identification of highest and best use scenarios could be cost effectively tested through the conduct of a market study by a nationally prominent property consultant.
- It would be desirable for Council to retain a strong planning and managing control of vacant land with direct access to airside aviation infrastructure. This land should be preserved for aviation industry needs. The remaining vacant airport land is a valuable commercial asset but with limited strategic importance and hence should be divested by Council for its highest and best use preferably in full or part to a private sector developer. The sale proceeds could be used by Council for future aviation infrastructure capital works.

The following actions are proposed:

- The Broken Hill region has a sustainable future as an origin/destination for the local regional population and most importantly for the developing tourist market providing the issues of low fares, low fare seat availability and jet services are addressed. Council as the owner of Broken Hill Airport should continue its concerted effort to expand existing services and/or attract new services in markets that are shown to be able to support new services. A strong business case which promotes Broken Hill Airport must be developed and marketed to prospective airlines namely Virgin Blue, Tiger and Jetstar at a time suitable to Council.
- A concerted marketing program in conjunction with the Broken Hill Council Tourism Department and Chamber of Commerce be developed targeting the local population catchment, key tourist outlets and publications in and around Broken Hill. Consideration should be given to approaching other regions that could possibly participate in a joint marketing scheme to promote tourism to the outback (eg Longreach).
- Council should meet with the key executives of Jetstar, Tiger and Virgin Blue with a view to discussing future infrastructure planning and the possibility of attracting more scheduled air services. The important issue here is to build relationships and knowledge so that Council is more aware of the air services market and the intentions of major RPT operators.
- Airlines attract air travellers who in turn provide the passenger landing fee revenue for Broken Hill Airport. Formal airline meetings should take place on a half yearly basis which constructively put forward Council's views on key airline operations issues including:
  - Fare structure;
  - Fare availability;
  - Service schedules;
  - New services;
  - Aircraft types;
  - Marketing; and
  - Internet booking.
  -
- Broken Hill Airport must seek to optimise commercial land opportunities. Broken Hill City Council's large land base at the airport is a valuable asset. It is recommended that development planning should look at opportunities to:
  - Optimise land derived revenues;
  - Create synergies with core aviation functions;
  - Market the land using an Aviation/Business Park branding or similar through advertising in prominent national aviation industry publications; and
  - Significantly overhaul the Broken Hill Airport pages on the Council’s web site.

Appendix A
Figures

Broken Hill Airport
Master Plan 2008
38322.001

Figure 1
Existing Airport
Aerial Photograph

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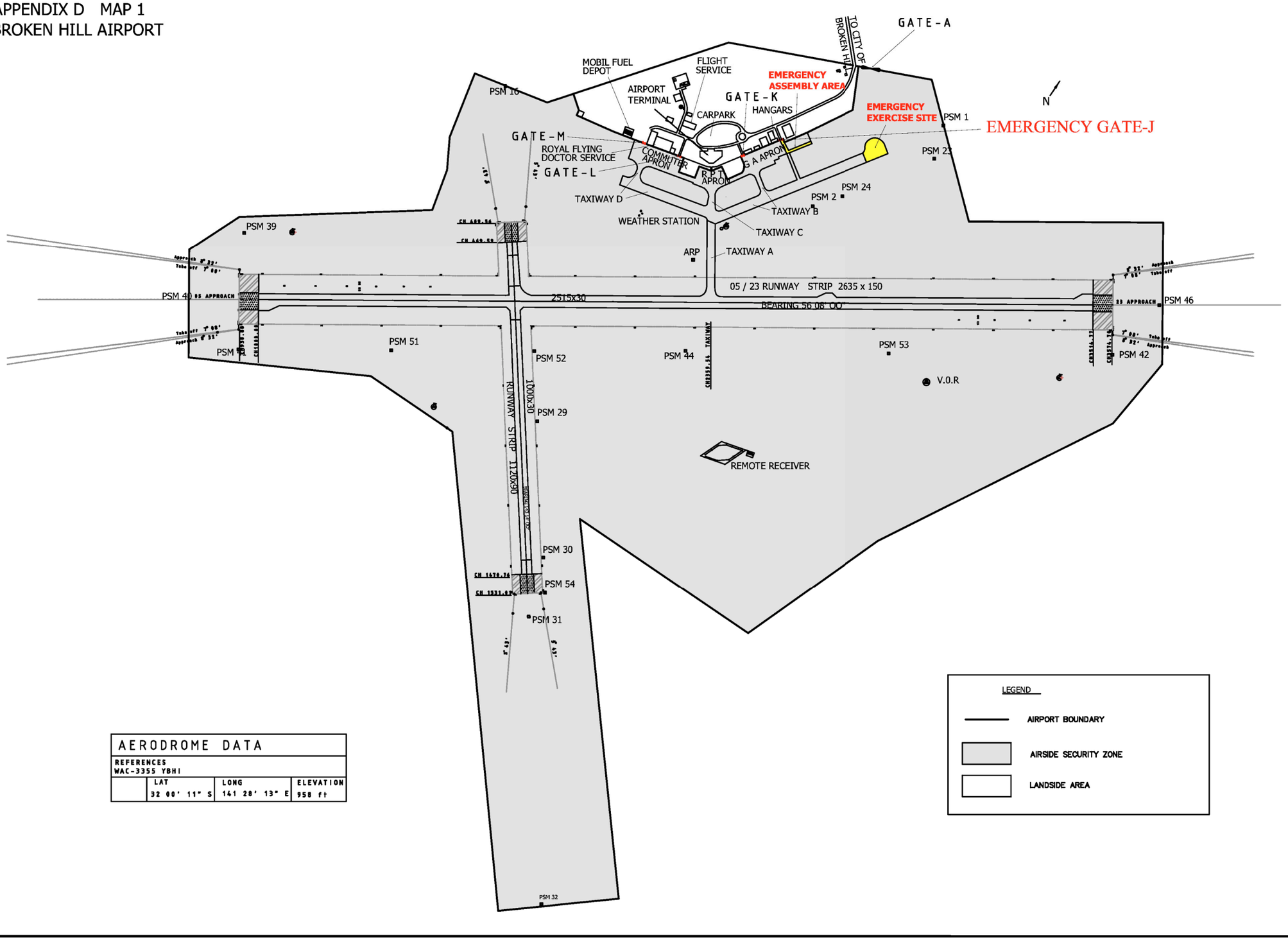
APPENDIX D MAP 1
BROKEN HILL AIRPORT



AERODROME DATA			
REFERENCES WAC-3355 YBHI			
	LAT	LONG	ELEVATION
	32 00' 11" S	141 28' 13" E	958 ft

LEGEND

- AIRPORT BOUNDARY
- AIRSIDE SECURITY ZONE
- LANDSIDE AREA

Broken Hill Airport
Master Plan 2008
38322.001

Figure 2
Existing Airport Facilities Plan

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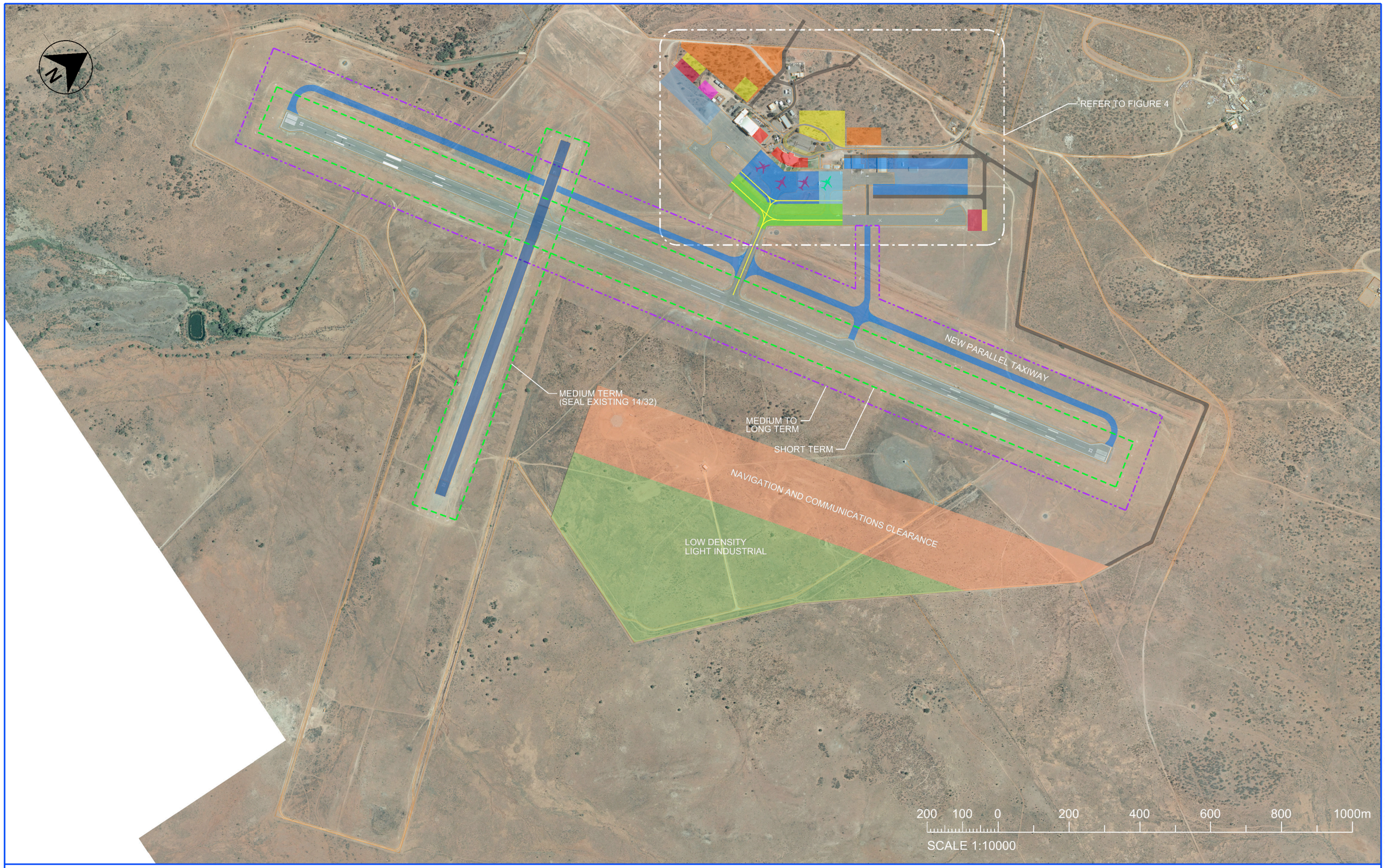

Broken Hill Airport
Master Plan 2008
38322.001

Figure 3
Movement Area Master Plan

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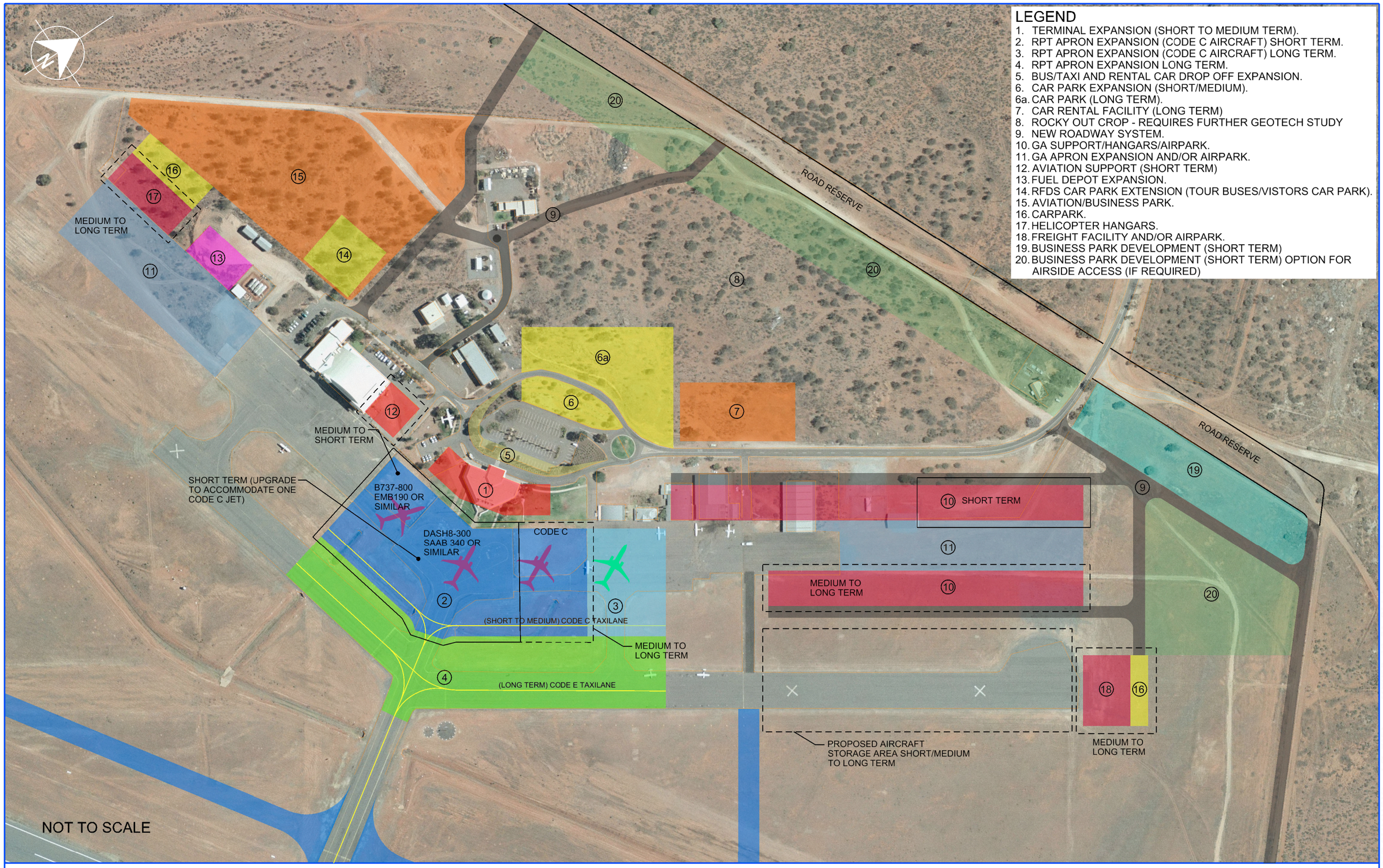

Broken Hill Airport
Master Plan 2008
38322.001

Figure 4
Terminal Area Master Plan

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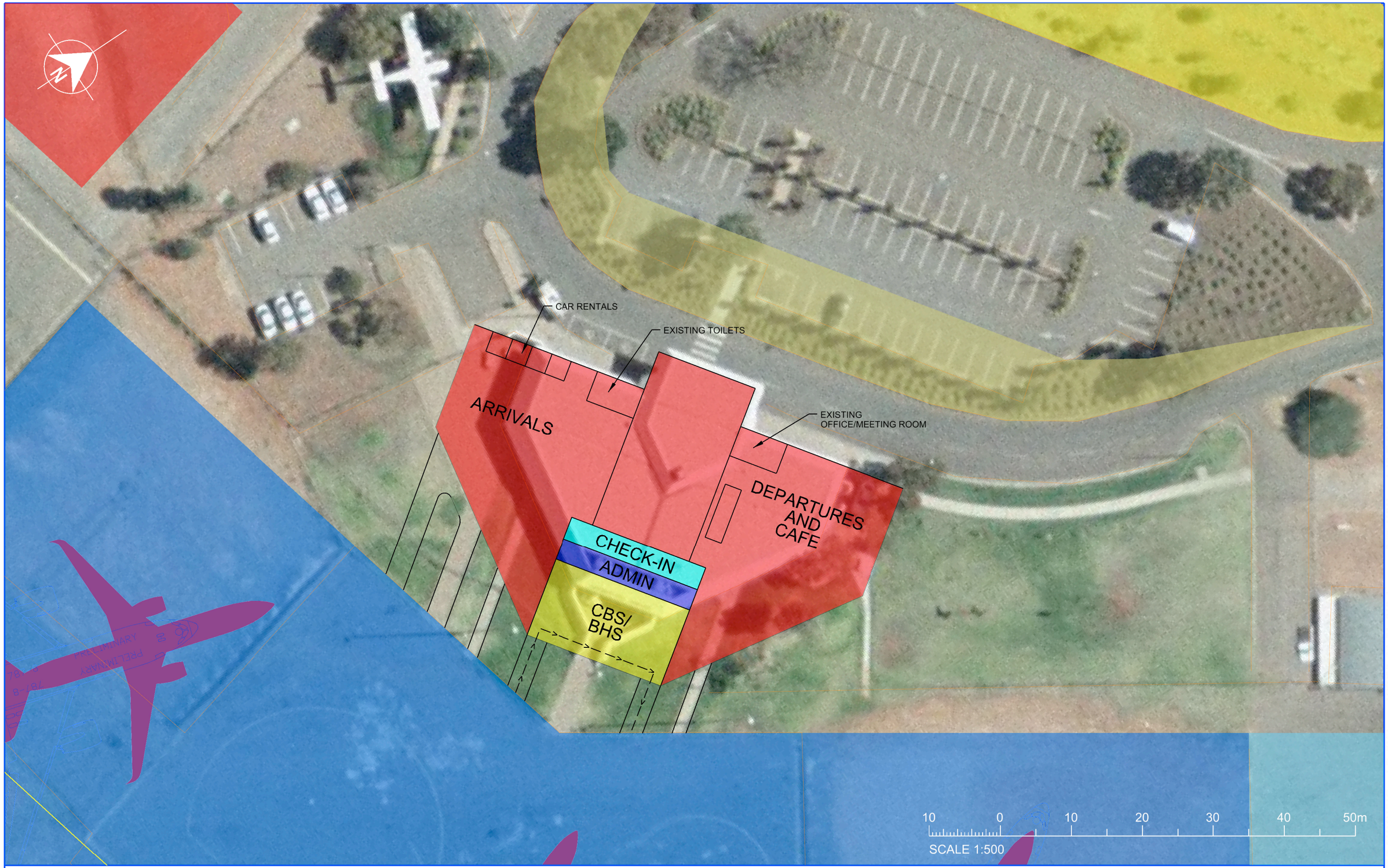

Broken Hill Airport
Master Plan 2008
38322.001

Figure 5
Indicative Terminal Layout
Short Term

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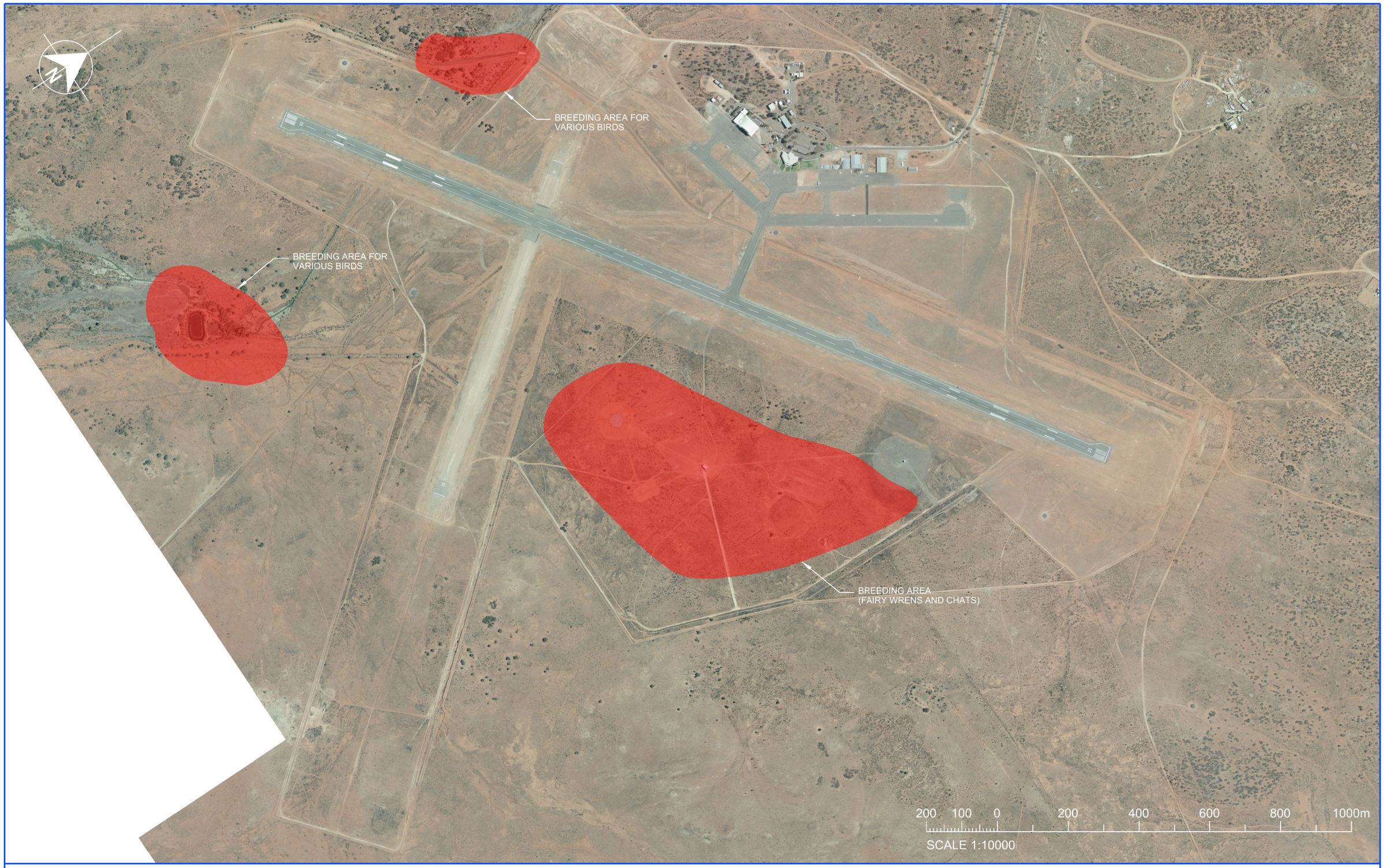
Broken Hill Airport
Master Plan 2008
38322.001

Figure 6
Indicative Terminal Layout
Medium to Long Term



Broken Hill Airport
Master Plan 2008
38322.001

Figure 7
Fauna Areas

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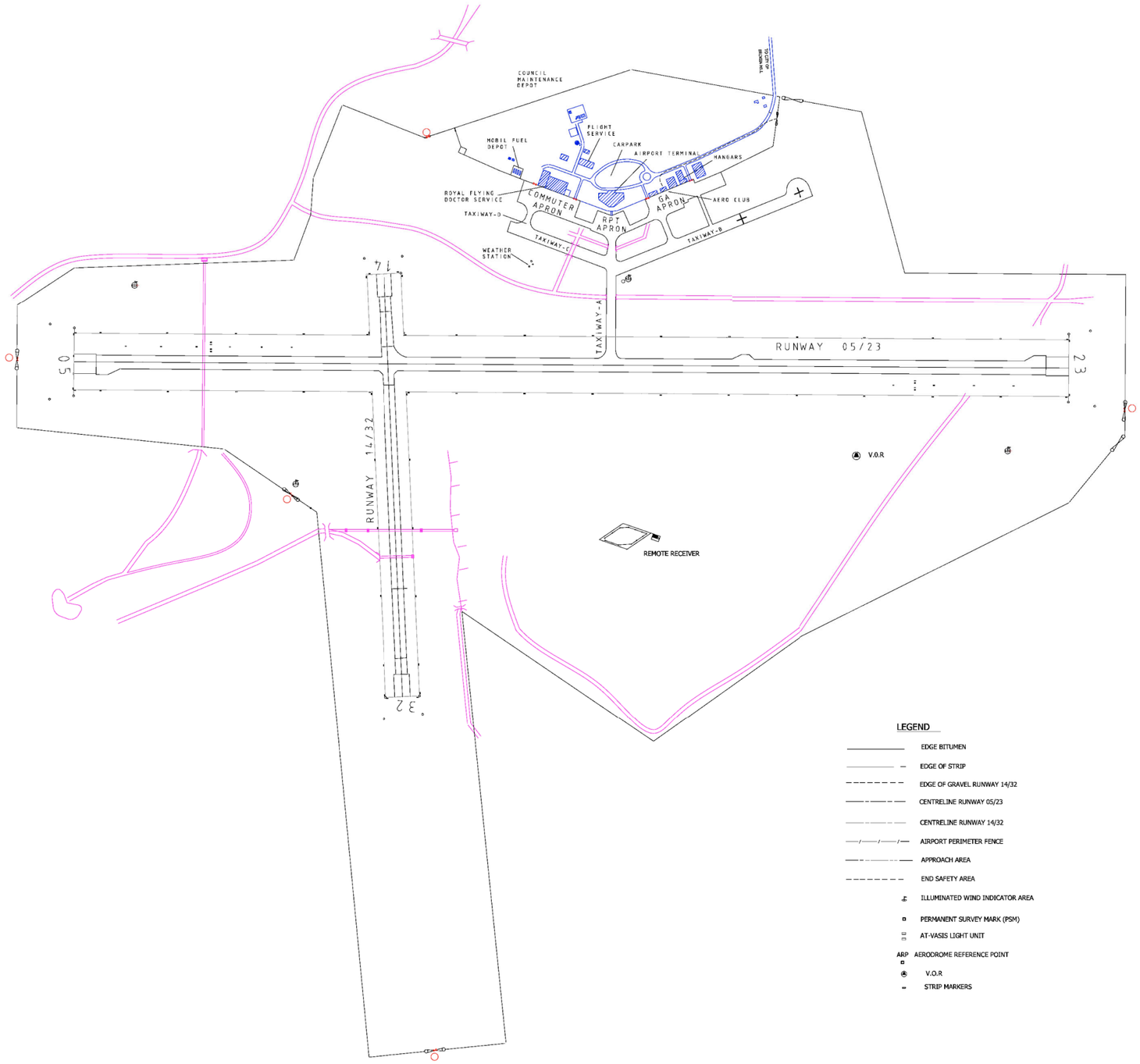

Broken Hill Airport
Master Plan 2008
38322.001

Figure 8
Water Courses

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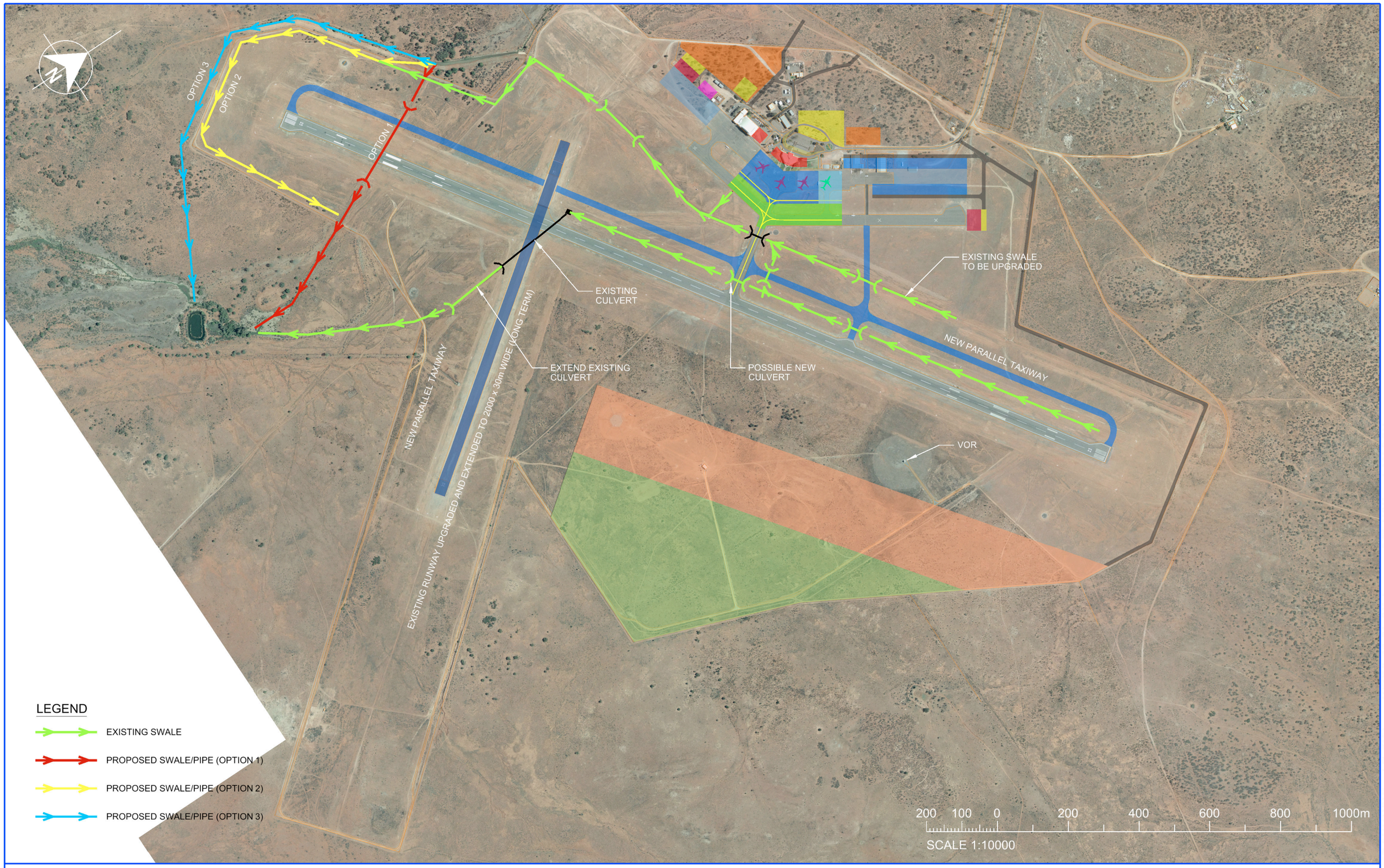
Broken Hill Airport
Master Plan 2008
38322.001

Figure 9
Flood Prone Areas

F:\multi\38322\001\CAD\Drgs\Civil\Figures\38322-FG-CA-009.dgn 5/05/2010 4:05:51 PM



Broken Hill Airport
Master Plan 2008
38322.001

Figure 10
Stormwater Upgrade

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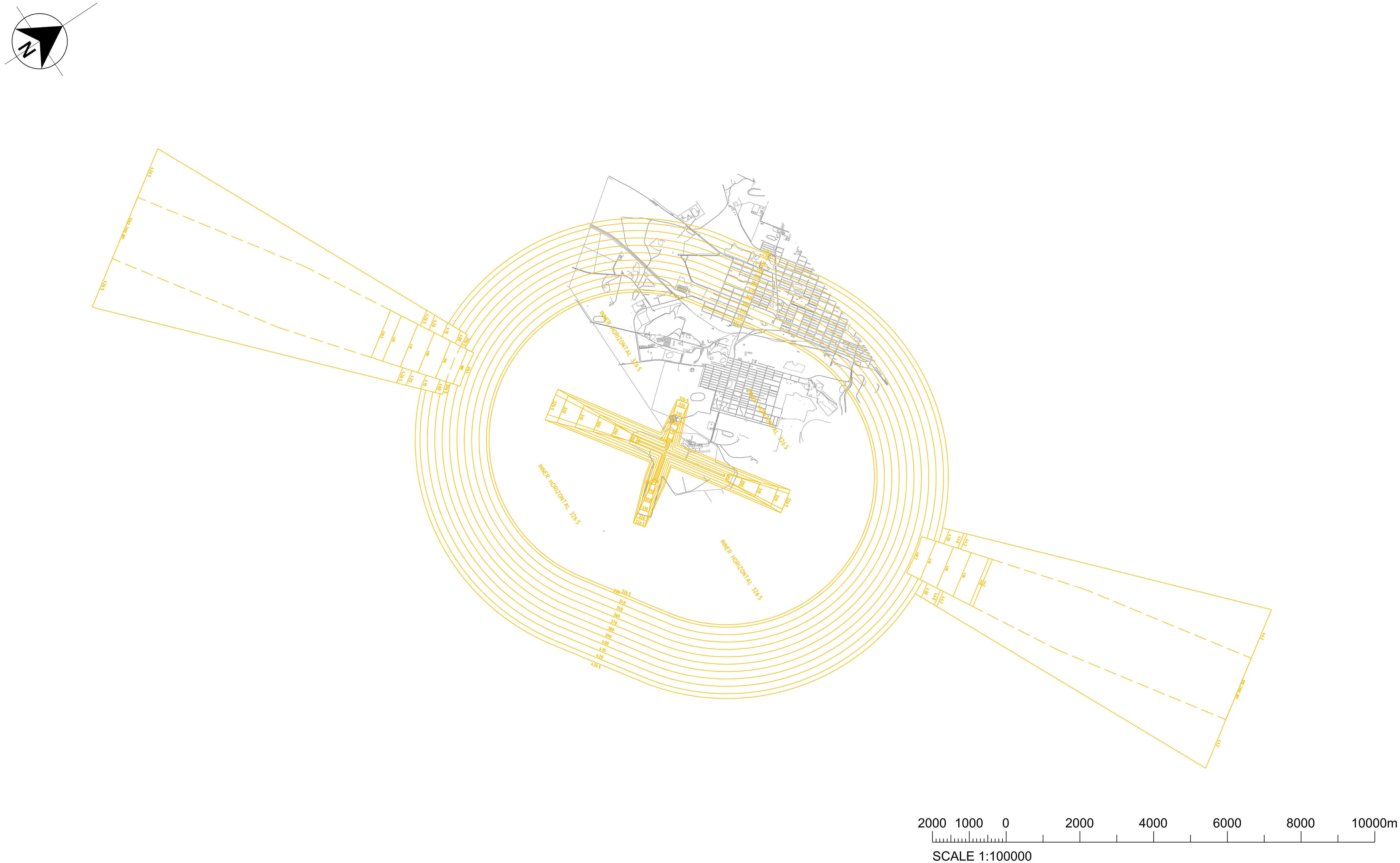

Broken Hill Airport
Master Plan 2008
38322.001

Figure 11
Existing Airport OLS

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RFDS TRANSFORMER

SUBSTATION 14432

SUBSTATION 14432

(SHORT TO MEDIUM) CODE C TAXILANE

(LONG TERM) CODE E TAXILANE

50 0 50 100 150 200 250m

SCALE 1:2500

Broken Hill Airport
Master Plan 2008
38322.001

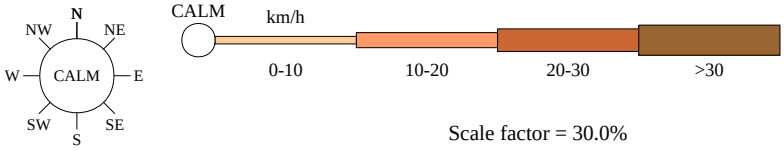
Figure 12
Electrical Substations

Appendix B
Wind Data Records

WIND FREQUENCY ANALYSIS (in km/h)

BROKEN HILL (PATTON STREET) STATION NUMBER 047007

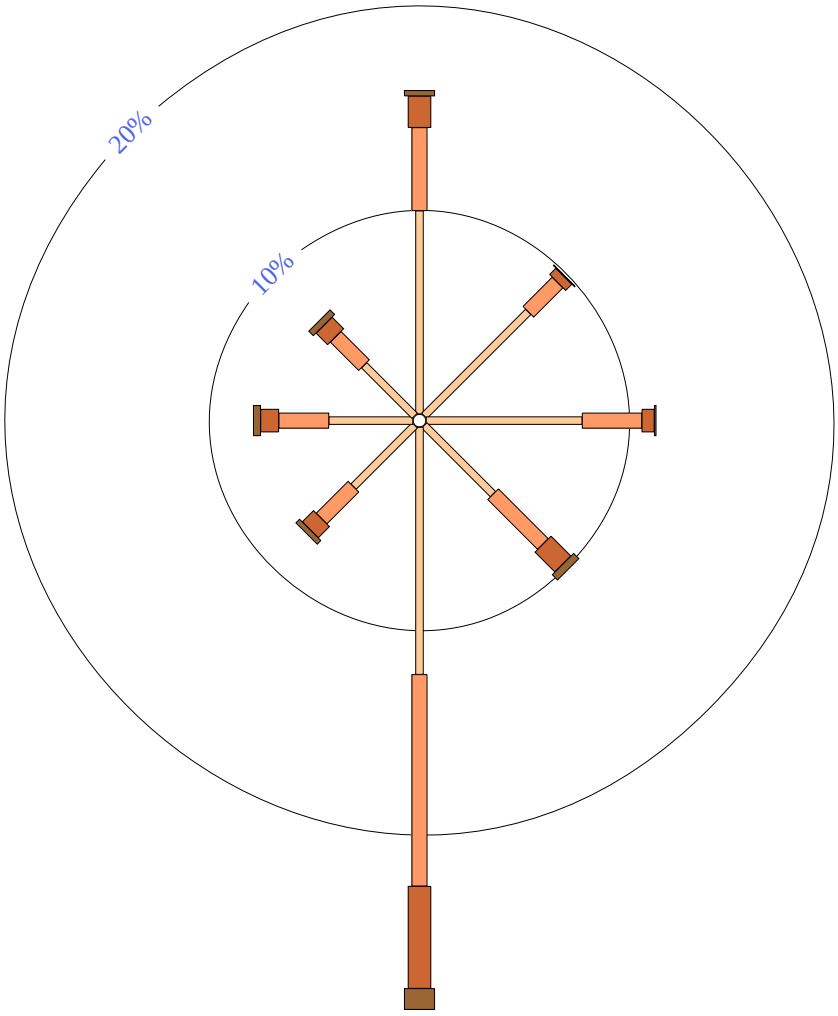
Latitude: -31.98 ° Longitude: 141.47 °



Scale factor = 30.0%

9 am
13479 Total Observations (1959 to 2004)

Calm 2%

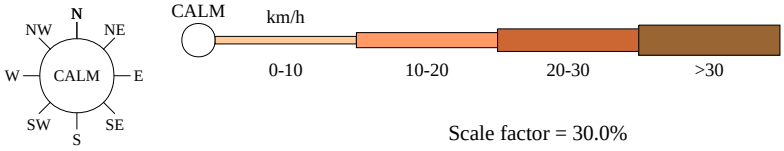


Wind directions are divided into eight compass directions. Calm has no direction.
An asterisk (*) indicates that calm is less than 1% .
An observed wind speed which falls precisely on the boundary between two divisions (eg 10km/h) will be included in the lower range (eg 1-10 km/h). Only quality controlled data have been used.

WIND FREQUENCY ANALYSIS (in km/h)

BROKEN HILL (PATTON STREET) STATION NUMBER 047007

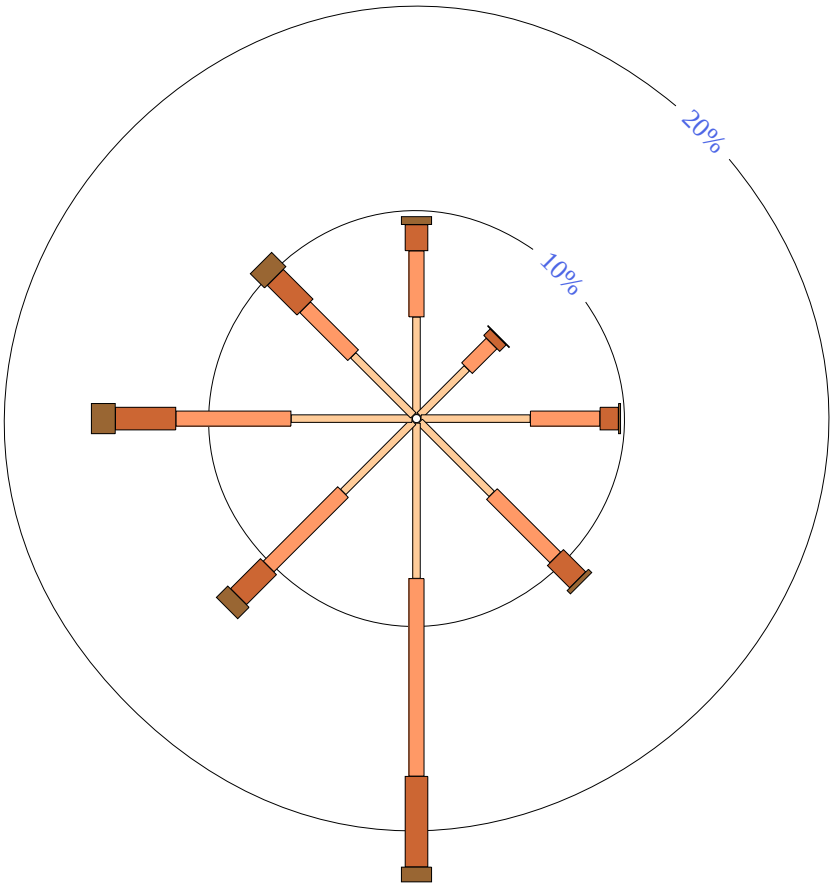
Latitude: -31.98 ° Longitude: 141.47 °



Scale factor = 30.0%

3 pm
13456 Total Observations (1959 to 2004)

Calm 1%



Wind directions are divided into eight compass directions. Calm has no direction.
An asterisk (*) indicates that calm is less than 1% .
An observed wind speed which falls precisely on the boundary between two divisions (eg 10km/h) will be included in the lower range (eg 1-10 km/h). Only quality controlled data have been used.

Appendix C
Country Water Demand Results

New Demand Data for Broken Hill Airport

The following data is the current hydraulic information available for the Broken Hill water supply system.

The data has been calculated using the Existing Conditions Broken Hill reticulation model, set to the design peak day with a total demand of 28ML. Pressures provided are at the point of connection to the existing 100 mm Fibro main on Bonanza Street and approximately 100 from corner of Knox Street.

Site specific data:

Location: Broken Hill Airport
RL of Site: 290.71 m

*Note that the RL of the site is based the RL the connect point in the WaterCAD model. The user may use this information at its own risk and should verify that the RL is correct and appropriate for use in design.

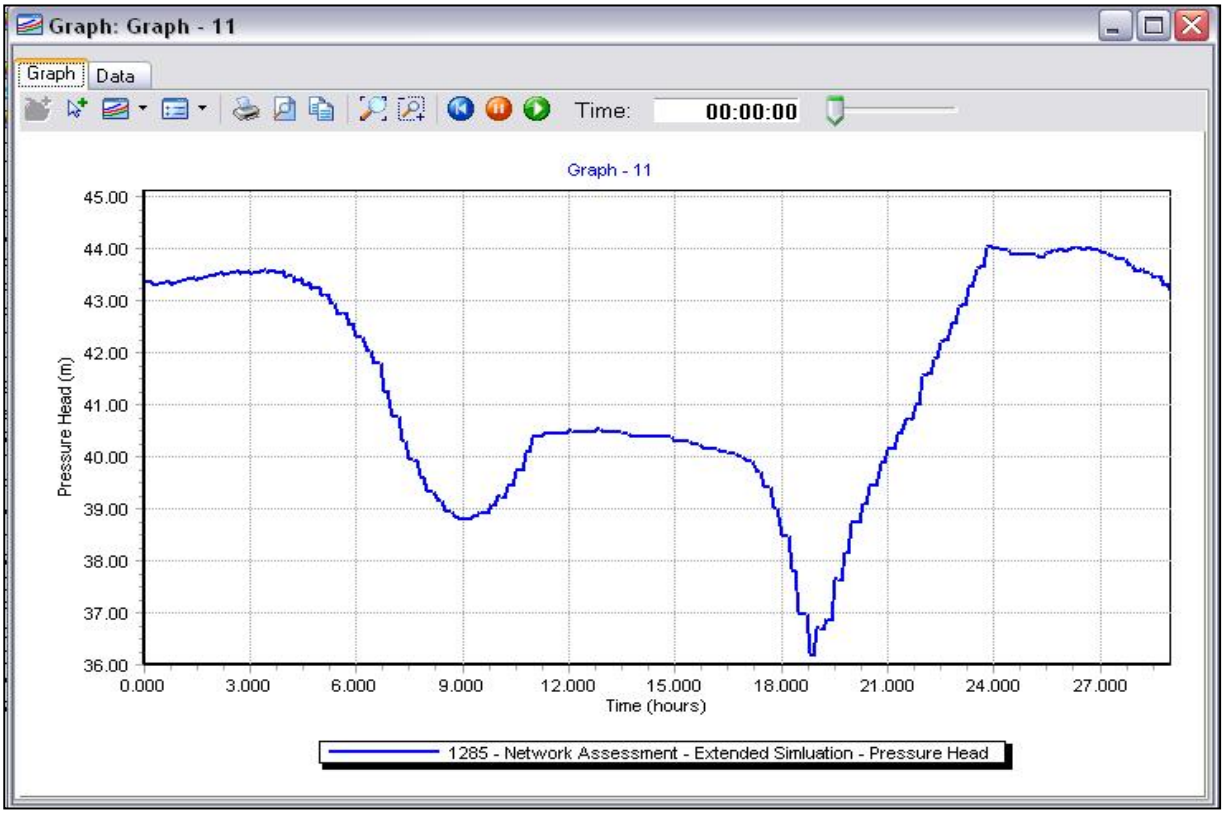
Available Flows and Pressures:

The following data has been obtained from the model and represents pressures achievable at least 95% of the time.

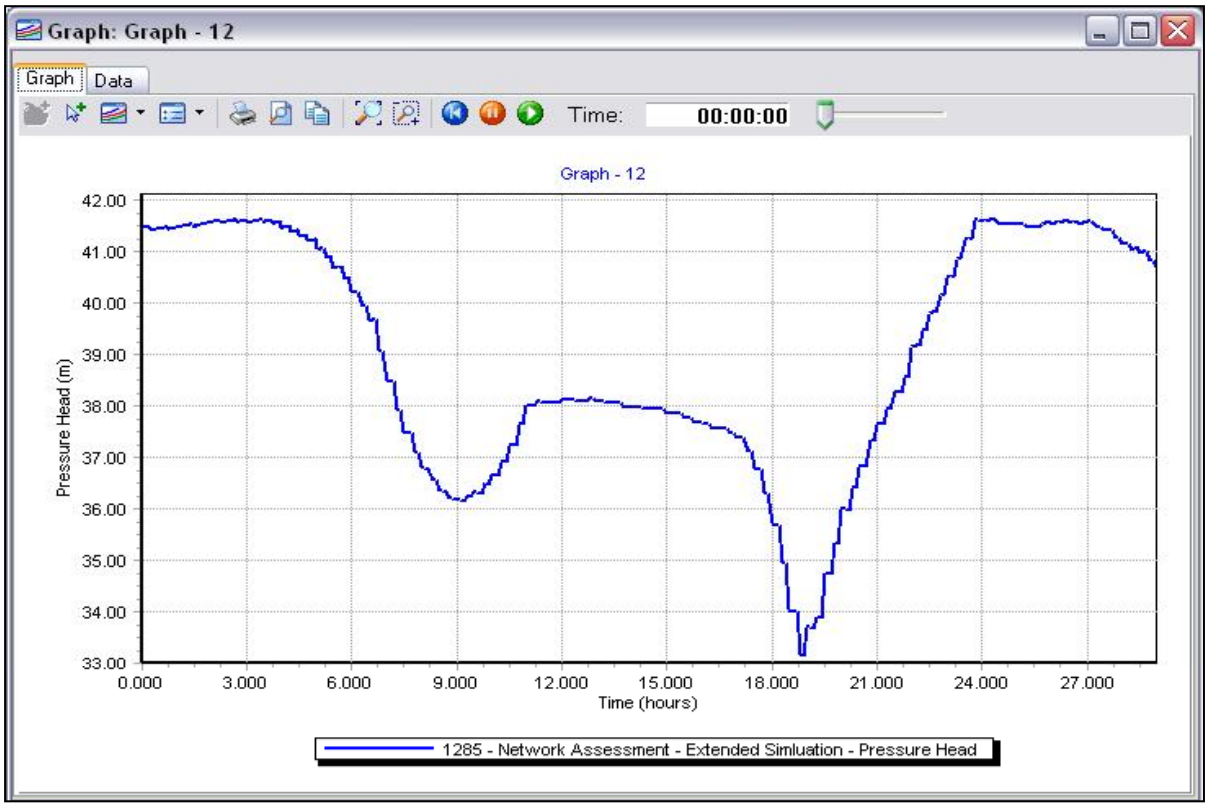
New Demand	Minimum Pressure (m)
0 L/s	36.16
6 L/s	33.12

The following charts show the pressure variation expected for the peak day at the connection point:

1. For Current Demand of 0.01 L/s



2. For Additional New Demand of 6 L/s



Appendix D
Forecast Annual Aircraft Movements

Table 1 Low Forecast Annual Aircraft Movements 2008/09 to 2027/28

Low

2008/09 Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.60	20	16	16,973
Sydney / Dubbo	Rex	Saab 340	34	0.60	20	10	10,608
Adelaide	Rex	Saab 340	34	0.60	20	32	33,946
2008/09 Total							***61,526***
2009/10							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.61	21	16	17,256
Sydney / Dubbo	Rex	Saab 340	34	0.61	21	10	10,785
Adelaide	Rex	Saab 340	34	0.61	21	32	34,511
2009/10 Total							***62,552***
2010/11							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.62	21	16	17,539
Sydney / Dubbo	Rex	Saab 340	34	0.62	21	10	10,962
Adelaide	Rex	Saab 340	34	0.62	21	32	35,077
2010/11 Total							***63,577***
2011/12							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.63	21	16	17,821
Sydney / Dubbo	Rex	Saab 340	34	0.63	21	10	11,138
Adelaide	Rex	Saab 340	34	0.63	21	32	35,643
2011/12 Total							***64,603***
2012/13							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.64	22	16	18,104
Sydney / Dubbo	Rex	Saab 340	34	0.64	22	10	11,315
Adelaide	Rex	Saab 340	34	0.64	22	32	36,209
2012/13 Total							***65,628***
2013/14							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.65	22	16	18,387
Sydney / Dubbo	Rex	Saab 340	34	0.65	22	10	11,492
Adelaide	Rex	Saab 340	34	0.65	22	32	36,774
2013/14 Total							***66,654***
2014/15							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.66	22	16	18,670
Sydney / Dubbo	Rex	Saab 340	34	0.66	22	10	11,669
Adelaide	Rex	Saab 340	34	0.66	22	32	37,340
2014/15 Total							***67,679***
2015/16							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.67	23	16	18,953
Sydney / Dubbo	Rex	Saab 340	34	0.67	23	10	11,846
Adelaide	Rex	Saab 340	34	0.67	23	32	37,906
2015/16 Total							***68,704***
2016/17							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.68	23	16	19,236
Sydney / Dubbo	Rex	Saab 340	34	0.68	23	10	12,022
Adelaide	Rex	Saab 340	34	0.68	23	32	38,472
2016/17 Total							***69,730***
2017/18							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.69	23	16	19,519
Sydney / Dubbo	Rex	Saab 340	34	0.69	23	10	12,199
Adelaide	Rex	Saab 340	34	0.69	23	32	39,037
2017/18 Total							***70,755***
2018/19							
Route	**Carrier**	**Aircraft**	**Max. Pax.**	**Load Factor**	**Pax.**	**Services per week**	**Annual Pax.**
Sydney	Rex	Saab 340	34	0.70	24	16	19,802
Sydney / Dubbo	Rex	Saab 340	34	0.70	24	10	12,376
Adelaide	Rex	Saab 340	34	0.70	24	32	39,603
2018/19 Total							***71,781***

Table 1 (continued): Low Forecast Annual Aircraft Movements 2008/09 to 2027/28

2019/20

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.71	24	16	20,084
Sydney / Dubbo	Rex	Saab 340	34	0.71	24	10	12,553
Adelaide	Rex	Saab 340	34	0.71	24	32	40,169
2019/20 Total							***72,806***

2020/21

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.72	24	16	20,367
Sydney / Dubbo	Rex	Saab 340	34	0.72	24	10	12,730
Adelaide	Rex	Saab 340	34	0.72	24	32	40,735
2020/21 Total							***73,832***

2021/22

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.73	25	16	20,650
Sydney / Dubbo	Rex	Saab 340	34	0.73	25	10	12,906
Adelaide	Rex	Saab 340	34	0.73	25	32	41,300
2021/22 Total							***74,857***

2022/23

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.74	25	16	20,933
Sydney / Dubbo	Rex	Saab 340	34	0.74	25	10	13,083
Adelaide	Rex	Saab 340	34	0.74	25	32	41,866
2022/23 Total							***75,883***

2023/24

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
2023/24 Total							***76,908***

2024/25

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.76	26	16	21,499
Sydney / Dubbo	Rex	Saab 340	34	0.76	26	10	13,437
Adelaide	Rex	Saab 340	34	0.76	26	32	42,998
2024/25 Total							***77,933***

2025/26

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.77	26	16	21,782
Sydney / Dubbo	Rex	Saab 340	34	0.77	26	10	13,614
Adelaide	Rex	Saab 340	34	0.77	26	32	43,564
2025/26 Total							***78,959***

2026/27

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.78	27	16	22,065
Sydney / Dubbo	Rex	Saab 340	34	0.78	27	10	13,790
Adelaide	Rex	Saab 340	34	0.78	27	32	44,129
2026/27 Total							***79,984***

2027/28

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.79	27	16	22,348
Sydney / Dubbo	Rex	Saab 340	34	0.79	27	10	13,967
Adelaide	Rex	Saab 340	34	0.79	27	32	44,695
2027/28 Total							***81,010***

Medium

2008/09

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.60	20	16	16,973
Sydney / Dubbo	Rex	Saab 340	34	0.60	20	10	10,608
Adelaide	Rex	Saab 340	34	0.60	20	32	33,946
2008/09 Total							***61,526***

2009/10

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.61	21	16	17,256
Sydney / Dubbo	Rex	Saab 340	34	0.61	21	10	10,785
Adelaide	Rex	Saab 340	34	0.61	21	32	34,511
2009/10 Total							***62,552***

2010/11

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.63	21	16	17,821
Sydney / Dubbo	Rex	Saab 340	34	0.63	21	10	11,138
Adelaide	Rex	Saab 340	34	0.63	21	32	35,643
2010/11 Total							***64,603***

2011/12

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.65	22	16	18,387
Sydney / Dubbo	Rex	Saab 340	34	0.65	22	10	11,492
Adelaide	Rex	Saab 340	34	0.65	22	32	36,774
2011/12 Total							***66,654***

2012/13

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.67	23	16	18,953
Sydney / Dubbo	Rex	Saab 340	34	0.67	23	10	11,846
Adelaide	Rex	Saab 340	34	0.67	23	32	37,906
Melbourne	Virgin	ERG 170	70	0.60	42	1	2,184
2012/13 Total							***70,888***

2013/14

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.69	23	16	19,519
Sydney / Dubbo	Rex	Saab 340	34	0.69	23	10	12,199
Adelaide	Rex	Saab 340	34	0.69	23	32	39,037
Melbourne	Virgin	ERG 170	70	0.65	46	1	2,366
2013/14 Total							***73,121***

2014/15

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.69	23	16	19,519
Sydney / Dubbo	Rex	Saab 340	34	0.69	23	10	12,199
Adelaide	Rex	Saab 340	34	0.69	23	32	39,037
Melbourne	Virgin	ERG 170	70	0.65	46	2	4,732
2014/15 Total							***75,487***

2015/16

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.70	24	16	19,802
Sydney / Dubbo	Rex	Saab 340	34	0.70	24	10	12,376
Adelaide	Rex	Saab 340	34	0.70	24	32	39,603
Melbourne	Virgin	ERG 170	70	0.65	46	2	4,732
2015/16 Total							***76,513***

2016/17

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.70	24	17	21,039
Sydney / Dubbo	Rex	Saab 340	34	0.70	24	10	12,376
Adelaide	Rex	Saab 340	34	0.70	24	33	40,841
Melbourne	Virgin	ERG 170	70	0.70	49	2	5,096
2016/17 Total							***79,352***

2017/18

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.70	24	18	22,277
Sydney / Dubbo	Rex	Saab 340	34	0.70	24	10	12,376
Adelaide	Rex	Saab 340	34	0.70	24	34	42,078
Melbourne	Virgin	ERG 170	70	0.70	49	2	5,096
2017/18 Total							***81,827***

Table 2: Medium Forecast Annual Aircraft Movements 2008/09 to 2027/28

2018/19

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.72	24	18	22,913
Sydney / Dubbo	Rex	Saab 340	34	0.72	24	10	12,730
Adelaide	Rex	Saab 340	34	0.72	24	34	43,281
Melbourne	Virgin	ERG 170	70	0.72	50	2	5,242
2018/19 Total							***84,165***

2019/20

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.72	24	18	22,913
Sydney / Dubbo	Rex	Saab 340	34	0.72	24	10	12,730
Adelaide	Rex	Saab 340	34	0.72	24	34	43,281
Melbourne	Virgin	ERG 170	70	0.72	50	3	7,862
2019/20 Total							***86,786***

2020/21

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.73	25	18	23,232
Sydney / Dubbo	Rex	Saab 340	34	0.73	25	10	12,906
Adelaide	Rex	Saab 340	34	0.73	25	34	43,882
Melbourne	Virgin	ERG 170	70	0.73	51	3	7,972
2020/21 Total							***87,991***

2021/22

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.73	25	18	23,232
Sydney / Dubbo	Rex	Saab 340	34	0.73	25	12	15,488
Adelaide	Rex	Saab 340	34	0.73	25	34	43,882
Melbourne	Virgin	ERG 170	70	0.73	51	3	7,972
2021/22 Total							***90,573***

2022/23

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.74	25	18	23,550
Sydney / Dubbo	Rex	Saab 340	34	0.74	25	12	15,700
Adelaide	Rex	Saab 340	34	0.74	25	34	44,483
Melbourne	Virgin	ERG 170	70	0.74	52	3	8,081
2022/23 Total							***91,813***

2023/24

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	18	23,868
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	12	15,912
Adelaide	Rex	Saab 340	34	0.75	26	34	45,084
Melbourne	Virgin	ERG 170	70	0.75	53	3	8,190
2023/24 Total							***93,054***

2024/25

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.76	26	18	24,186
Sydney / Dubbo	Rex	Saab 340	34	0.76	26	12	16,124
Adelaide	Rex	Saab 340	34	0.76	26	34	45,685
Melbourne	Virgin	ERG 170	70	0.76	53	3	8,299
2024/25 Total							***94,295***

2025/26

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.77	26	18	24,504
Sydney / Dubbo	Rex	Saab 340	34	0.77	26	12	16,336
Adelaide	Rex	Saab 340	34	0.77	26	34	46,286
Melbourne	Virgin	ERG 170	70	0.77	54	3	8,408
2025/26 Total							***95,535***

2026/27

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.78	27	18	24,823
Sydney / Dubbo	Rex	Saab 340	34	0.78	27	12	16,548
Adelaide	Rex	Saab 340	34	0.78	27	34	46,887
Melbourne	Virgin	ERG 170	70	0.78	55	3	8,518
2026/27 Total							***96,776***

2027/28

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.79	27	18	25,141
Sydney / Dubbo	Rex	Saab 340	34	0.79	27	12	16,761
Adelaide	Rex	Saab 340	34	0.79	27	34	47,488
Melbourne	Virgin	ERG 170	70	0.79	55	3	8,627
2027/28 Total							***98,017***

Table 2 (continued): Medium Forecast Annual Aircraft Movements 2008/09 to 2027/28

2008/09

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.60	20.4	16	16,973
Sydney / Dubbo	Rex	Saab 340	34	0.60	20.4	10	10,608
Adelaide	Rex	Saab 340	34	0.60	20.4	32	33,946
2008/09 Total							***61,526***

2009/10

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.65	22	16	18,387
Sydney / Dubbo	Rex	Saab 340	34	0.65	22	10	11,492
Adelaide	Rex	Saab 340	34	0.65	22	32	36,774
2009/10 Total							***66,654***

2010/11

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.70	24	16	19,802
Sydney / Dubbo	Rex	Saab 340	34	0.70	24	10	12,376
Adelaide	Rex	Saab 340	34	0.70	24	32	39,603
2010/11 Total							***71,781***

2011/12

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.71	24	16	20,084
Sydney / Dubbo	Rex	Saab 340	34	0.71	24	10	12,553
Adelaide	Rex	Saab 340	34	0.71	24	32	40,169
Melbourne	Virgin	ERJ 170	70	0.60	42	1	2,184
2011/12 Total							***74,990***

2012/13

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.72	24	16	20,367
Sydney / Dubbo	Rex	Saab 340	34	0.72	24	10	12,730
Adelaide	Rex	Saab 340	34	0.72	24	32	40,735
Sydney	Virgin	ERJ 170	70	0.60	42	1	2,184
Melbourne	Virgin	ERJ 170	70	0.65	46	1	2,366
2012/13 Total							***78,382***

2013/14

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.73	25	16	20,650
Sydney / Dubbo	Rex	Saab 340	34	0.73	25	10	12,906
Adelaide	Rex	Saab 340	34	0.73	25	32	41,300
Sydney	Virgin	ERJ 170	70	0.65	46	1	2,366
Melbourne	Virgin	ERJ 170	70	0.60	42	2	4,368
2013/14 Total							***81,591***

2014/15

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.74	25	16	20,933
Sydney / Dubbo	Rex	Saab 340	34	0.74	25	10	13,083
Adelaide	Rex	Saab 340	34	0.74	25	32	41,866
Sydney	Virgin	ERJ 170	70	0.60	42	2	4,368
Melbourne	Virgin	ERJ 170	70	0.65	46	2	4,732
2014/15 Total							***84,983***

2015/16

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.65	46	2	4,732
Melbourne	Virgin	ERJ 170	70	0.60	42	3	6,552
2015/16 Total							***88,192***

2016/17

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.60	42	3	6,552
Melbourne	Virgin	ERJ 170	70	0.65	46	3	7,098
2016/17 Total							***90,558***

2017/18

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.65	46	3	7,098
Melbourne	Virgin	ERJ 170	70	0.60	42	4	8,736
2017/18 Total							***92,742***

2018/19

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.65	46	3	7,098
Melbourne	Virgin	ERJ 170	70	0.65	46	4	9,464
Other		737-600	130	0.50	65	1	3,380
2018/19 Total							***96,850***

Table 3: High Forecast Annual Aircraft Movements 2008/09 to 2027/28

2019/20

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.60	42	4	8,736
Melbourne	Virgin	ERJ 170	70	0.65	46	4	9,464
Other		737-600	130	0.60	78	1	4,056
2019/20 Total							***99,164***

2020/21

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.65	46	4	9,464
Melbourne	Virgin	ERJ 170	70	0.70	49	4	10,192
Other		737-600	130	0.70	91	1	4,732
2020/21 Total							***101,296***

2021/22

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.60	42	5	10,920
Melbourne	Virgin	ERJ 170	70	0.60	42	5	10,920
Other		737-600	130	0.60	78	2	8,112
2021/22 Total							***106,860***

2022/23

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.65	46	5	11,830
Melbourne	Virgin	ERJ 170	70	0.65	46	5	11,830
Other		737-600	130	0.65	85	2	8,788
2022/23 Total							***109,356***

2023/24

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.60	42	6	13,104
Melbourne	Virgin	ERJ 170	70	0.60	42	6	13,104
Other		737-600	130	0.60	78	2	8,112
2023/24 Total							***111,228***

2024/25

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.65	46	6	14,196
Melbourne	Virgin	ERJ 170	70	0.65	46	6	14,196
Other		737-600	130	0.60	78	2	8,112
2024/25 Total							***113,412***

2025/26

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.60	42	7	15,288
Melbourne	Virgin	ERJ 170	70	0.60	42	7	15,288
Other		737-600	130	0.60	78	3	12,168
2025/26 Total							***119,652***

2026/27

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.65	46	6	14,196
Melbourne	Virgin	ERJ 170	70	0.65	46	7	16,562
Other		737-600	130	0.65	85	3	13,182
2026/27 Total							***120,848***

2027/28

Route	Carrier	Aircraft	Max. Pax.	Load Factor	Pax.	Services per week	Annual Pax.
Sydney	Rex	Saab 340	34	0.75	26	16	21,216
Sydney / Dubbo	Rex	Saab 340	34	0.75	26	10	13,260
Adelaide	Rex	Saab 340	34	0.75	26	32	42,432
Sydney	Virgin	ERJ 170	70	0.70	49	7	17,836
Melbourne	Virgin	ERJ 170	70	0.70	49	7	17,836
Other		737-600	130	0.70	91	3	14,196
2027/28 Total							***126,776***

Appendix E
Stakeholder Consultation Feedback

Company	Name	Nature of Business	No of Aircraft	Aircraft Types	Runways	Taxiways	Apron Area	Tie Downs	Hangars	Fuel	Nav Aid & Lighting	Other Airside Comments	Security Issues	Terminal	Car Park	Entry Road	Airline Service	Non Aviation Activities	Gen Comments
Aero Club	Jim Nesbit	40 Members, 6 aircraft in Broken Hill, 12 outside	6	Sport Aircraft	Seal the Cross strip.	Extend to both ends of the main runway.	Better marking.	Fine	More needed.	Well serviced but card bowsers will be good.	He is a day pilot and they are adequate for daylight operations.	Council is doing a good job keeping wildlife away.	Council run-around are working well.	Public view and marketing could be improved	Fine.	Clean up to make more attractive.	Flights to Melbourne and Mildura.	Limit to aviation.	Should have closer ties between Council and aero community.
Yellow Cabs	Terry Capper	Taxi Service	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Improve security for leaving cars overnight	Unloading of passengers/ baggage could be improved	Fine. Taxi ranks needs to be reconfigured.	Fine.	Flights to Mildura.	No need for retail – inappropriate at Broken Hill.	Fine airport apart from the set-up of the taxi rank. Rex's pricing and cancelling of flights is a problem.
Perilya Mining	Kristy	Kristy drops and collects staff from the airport. She also uses the airport.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	Fine for a rural airport	Layout could be clearer.	Could look better.	Melbourne.	For size of airport and town it is not appropriate.	Generally works well.
CBH Mining	Joan	Joan drops and collects staff from the airport. She also uses the airport.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	Works well	Adequate	Fine.	Melbourne	Not necessary for a small airport.	Rex's pricing and cancelling of flights is the biggest problem.
N/A	Ross Andrews	Private Aircraft owner	1	Cesna 172	Cross strip should be sealed.	OK.	OK.	Better marking so people know where they are.	Uses the Church Hangar	Private operator has high prices.	Nav Aids adequate and doesn't use lighting.	None	Working well.	Adequate.	Adequate.	Fine.	Service so people can come from Sydney and return in the same day.	Crematorium and RFDS exist.	Should abolish landing charges – there isn't enough traffic to warrant these charges. Maintenance work by Council is limited to the hours that Council staff work and this can hamper use and safety.
Royal Flying Doctor Service	Kerrie (staff), Noel (engineer) & Magnus (pilot)	Flying Doctors.	4	Hawker Beechcraft King Air 200	Pretty good need to be improved for bigger aircraft. Don't shorten them.	More would be great but may be cost prohibitive.	Fine - need to be expanded for bigger aircraft.	Fine.	Council should encourage hangar construction by individuals.	Tankers come to aircraft. Fine.	Both good.	Broadcasting of weather conditions would be beneficial	Lots of locked gates but fencing is a joke. (Can be stepped over).	Café works well. Could do with an overhaul but is ok.	Fine	A new welcome/farewell sign needed	Melbourne, Mildura	RFDS have museum. Drop off / [pick-up nature of airport limits possibilities.	A good country airport.
Crematorium	John Curtis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	Could be open more often - outside of flights.	More car parking useful.	A new welcome/farewell sign needed. An alternate entry point could be provided.	Melbourne, Mildura	No Need.	Another airline and competition would be good.
Bemax	Gavin Swart	Mining Company infrequent user.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	Is good.	Fine	Fine.	Limited. Rex is expensive. Flight to Melb would be good especially over weekend.	RFDS museum is a good attractor.	None
Airport Kiosk	Janet	Café	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	Been the same for 20 years	Plenty of car parking	A new welcome/farewell sign needed	Melbourne flights	People are here just for flights. RFDS does tours.	None.
Uniting Church Australia	John Blair	Flies a Cessna to remote	1	Cessna	Seal the cross strip. Improve	Additional one at northern	Fine.	Tie downs for fly-ins in front of	In good shape.	Bowser will be good.	Lighting fine. Questions	His lease prohibits him from	Have enough security.	The security fence shunts	More needed for special events and in	Narrow - could be wider.	Melbourne	Crematorium. Development potential	More integration of township and airport needed. Release land

Company	Name	Nature of Business	No of Aircraft	Aircraft Types	Runways	Taxiways	Apron Area	Tie Downs	Hangars	Fuel	Nav Aid & Lighting	Other Airside Comments	Security Issues	Terminal	Car Park	Entry Road	Airline Service	Non Aviation Activities	Gen Comments
		locations			for bigger aircraft.	end of 05 Runway.		his hangar.			the location of the receiver and transmitter.	putting up an antenna - why?		people towards the café which causes a blockage.	the future.	Kangaroos and walkers can be a problem. Provide footpath. Water drains off roadway and causes flooding.		mining/ metals tourism.	around airport for development.
Avis	Bruce Bennett	Hire car	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	Fine.	Main car park is ok. Rental car park is too small.	Fine.	Flights to Melbourne and Mildura	Car wash & service station	Fine for a small regional centre.
Jetset Broken Hill	Cheryl Cuy	Bookings for flights based in Broken Hill	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Need for overnight lighting	Structure with doors behind check-in staff is very awkward	Safety for overnight car parking	The 1/2 round-a-bouts have caused some confusion	No Comment	Café is well run. Crematorium.	Improve security process for arrivals and departures which will stop the blockage in the café
SD Freight	Steve Trel	Air Freight up-lift agent	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Fencing has restricted public from using café and farewell area.	Secure area for passengers line goes through the café.	Freight have own area and are happy with this.	Lots of walkers use it and there is no footpath. Is dangerous.	No Comment	Crematorium existing. Not much potential for expansion as there are other industrial areas.	Would like the chance to explain in person on site when consultants are involved. It now looks very ugly as there is security fencing everywhere which isn't effective.
Kamachlo	Matthew Morrison	Aircraft refuelling	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	No Comment	Has own car park	Fine.	Rex is the current carrier	Activity at airport is firmly related to arrival / departure of Rex flights.	Seems to be operating ok
Corner Country Air Services	Chris Harrison	Maintenance	None	4,000kg	Too long	No Comment	OK	OK	Owner	No Comment	No comment	No	ASIC	Good	OK	OK	Times OK. Better service now.	No Comment	Council makes it difficult for new hanger to be erected. Like to see freehold - more security.
Wettenhall Air Services	Nigel Wettenhall	Air Charter	2	Baron, PA28	OK	OK	Between RPT and GA Apron is a bit ordinary and requires a tidy up.	No Comment	Good	Swipe card facility would be good. Mobile fuel tank not convenient for small aircraft.	OK	No Comment	Nonsense RPT are secure, GA not secure.	Good	OK	OK	Do not use it	No Comment	Toilets not in good condition.