REHBEIN AOS

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Ballina Byron Gateway Airport Development Strategy Review

For Ballina Shire Council

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1.0 INTRODUCTION

Rehbein AOS Airport Consulting was commissioned by Ballina Shire Council (Council) to conduct a review of the 2002 Ballina Airport Development Strategy and 2004 Airport Master Plan Review, with particular regard to future general aviation infrastructure requirements.

The study specifically addresses issues relating to projected traffic; the requirement for a cross runway; the preferred location of general aviation facilities; taxiway access; hangar buildings and space; aircraft apron and parking areas; and security considerations.

The review is presented as a supplementary report to both the 2002 Airport Development Strategy and the 2004 Master Plan Review.

This report sets out the analysis and findings of the study as follows:

- Section 2.0 describes the methodology used to conduct the analysis and determine the key design parameters;
- Section 3.0 describes the existing facilities at Ballina Byron Gateway Airport;
- Section 4.0 presents passenger and aircraft movement forecasts;
- Section 5.0 describes future airfield requirements for general aviation; and
- Section 6.0 presents the key conclusions for the future development of the site.

2.0 METHODOLOGY

2.1 EXISTING SITUATION

A comprehensive review of the following existing relevant supporting information provided by Council and sourced from within Rehbein AOS's records, was undertaken:

- Ballina Airport Development Strategy (2002);
- Ballina Airport Master Plan Review (2004);
- Airport Business Plan 2007-2015 (2006);
- Airport Passenger Terminal Review (2006);
- Draft Southern Cross Business Park Master Plan (2007);
- Ballina Airport Cross Runway Desktop Assessment (2007);
- 2007 – 2008 RPT passenger numbers and aircraft movements;
- 2005 – 2008 Aircraft movement data as monitored by AvData Australia;
- Details of current leases on the airport; and
- The current RPT schedule.

Following this review, a targeted consultation process with key stakeholders was agreed with the Airport Operations Manager. A consultation schedule listing all stakeholders consulted is included at Appendix A.

The majority of the consultation was conducted during a visit by a Rehbein AOS representative to Ballina Byron Gateway Airport on 9 May 2008, with the remainder being carried out subsequently by telephone.

In addition, a review of the existing airport facilities was undertaken during the site visit.

2.2 AVIATION ACTIVITY FORECASTS

The report addresses in particular:

- Updated forecasts of RPT aircraft movements and passenger numbers; and
- Updated forecasts of GA movements.

Updated forecasts have been developed using historical aviation activity data supplied by Council and from the Bureau of Infrastructure, Transport, and Regional Economics (BITRE), as well as consideration of key indicators such as population growth and tourism forecasts and the experience and expertise of Rehbein AOS with respect to likely developments within the RPT and

GA sectors of the aviation industry.

The updated passenger and aircraft movement forecasts are presented in Section 4.0.

2.3 IDENTIFICATION OF FACILITY REQUIREMENTS

Identification of facility requirements included:

- An assessment of the need for a cross runway;
- An assessment of requirements for commercial GA hangars and other facilities;
- Assessment of private hangar requirements (number, size and location) based on the current and likely future private aircraft fleet;
- An assessment of the requirements for parking of itinerant aircraft (sealed and unsealed areas);
- Assessment of the warrant for and suitable location of a helipad;
- Identification of requirements for support services such as fuel;
- An assessment of requirements for air traffic control (ATC) services and radio navigation aids (navaids);
- An assessment of requirements for Aerodrome Rescue and Fire Fighting Services (ARFFS);
- Identification of the most suitable locations on the airport for each type of facility and the extent to which the potential development would be capable of meeting expected demand, taking into account:
    - Aircraft and airport operational considerations;
    - Compatibility with the long-term strategic land use requirements and the need to protect each area for the highest and best land use; and
    - Security and access requirements.
- Development of a preferred concept layout for the future GA facilities on the airport taking into account all of the above factors.

2.4 ASSESSMENT OF CROSS RUNWAY

The primary factor influencing the warrant for the cross runway is the extent to which its provision would increase the availability of a runway upon which safe operations by light aircraft can be undertaken.

To determine this, a wind rose analysis was conducted to assess the estimated runway usability factor for:

- The main 06-24 runway only
- A possible cross runway; and
- Both runways.

From the wind rose analysis, it was possible to estimate the additional usability of the airfield for light aircraft users as a result of providing the cross runway.

The secondary factor influencing the need for the cross runway is the extent to which its provision and the subsequent increase in runway system capacity would allow light aircraft, under favourable wind conditions, greater access to the runways with less delay during peak periods.

Therefore, the accessibility of the main runway to GA users in peak periods due to occupancy by RPT operations and taxi routes and distances for GA users and the extent of any impacts this might cause on airport operations was assessed

An order of magnitude assessment of likely construction costs and subsequent increase in airport revenues was undertaken to evaluate at a conceptual level the cost/benefit of the provision of the cross runway.

The results of the assessment are presented in Section 5.1.

3.0 EXISTING FACILITIES

3.1 RUNWAYS, TAXIWAYS AND APRONS

Ballina Byron Gateway Airport currently has one runway and two taxiways, one of which leads to the RPT apron and the other to a General Aviation (GA) apron and hangar area. All aircraft pavements are sealed.

The existing RPT apron is adequate for the current RPT aircraft demand and can accommodate up to two current generation B737 aircraft simultaneously.

The 06/24 runway is 1,900 metres long and 30 metres wide with a 150 metre wide strip. All aircraft enter and exit the runway by the 18 metre wide RPT stub taxiway.

The present length and width of the main runway were adopted to cater for the Boeing 737-800 and Airbus A320 type aircraft currently operating at the airport. As published by the Civil Aviation Safety Authority (CASA) in paragraph 74.2.4 of the AIP the use of a 30 metre wide runway by these aircraft types in lieu of the normal 45 metre standard for Reference Code 4C aircraft is permissible.

In addition, a pavement management strategy has been developed to provide a maintenance plan for the airports pavements and is updated as required.

3.2 FUEL FACILITIES

Shell is the only aviation fuel provider and provides 24 hour service for aviation gasoline (AVGAS) and aviation turbine fuel (AVTUR).

3.3 BUILDINGS

The passenger terminal, which was constructed in 1995, is the main building on the airport and is located to the south of the runway. The former terminal building is situated directly west of the existing terminal building and is currently occupied by the offices for Thrifty car rental and Aussie Air.

The existing terminal building is undergoing expansion in mid-2008 to provide for additional check-in and checked bag screening facilities. There is a plan to expand the terminal further in accordance with a design completed by architects commissioned by Council. Once these works have been completed, the terminal building will be capable of accommodating passengers associated with 2 medium-sized jet aircraft (B737/A320 type) operating simultaneously.

A number of hangars are situated within the GA area which is currently located west of the RPT of the apron.

The airport terminal and GA areas are linked to the Pacific Highway via North Creek Road and Southern Cross Drive.

3.4 UTILITIES

The airport is connected to all town utilities.

3.5 AIRPORT LIGHTING

The 06/24 runway is fitted with low intensity runway edge lighting and the taxiway with edge lighting.

An abbreviated T-VASIS (visual approach slope indicator system) is provided for both runway directions.

A pilot activated airport lighting control (PAALC) system is provided for the:

- Runway and taxi lights;
- Illuminated wind indicator;
- AT-VASIS approach lighting; and
- Apron floodlights.

Standby power is available.

3.6 NAVIGATION AIDS

A Non Directional Beacon (NDB) is located on the southern side of the airport midway along the runway.

3.7 COMPLIANCE

The airside facilities and airport lighting comply with the applicable Civil Aviation Safety Authority (CASA) standards.

4.0 FORECAST AVIATION ACTIVITY

This section analyses historical records of passenger numbers and aircraft movements at Ballina Byron Gateway Airport and presents projections of future aviation activity.

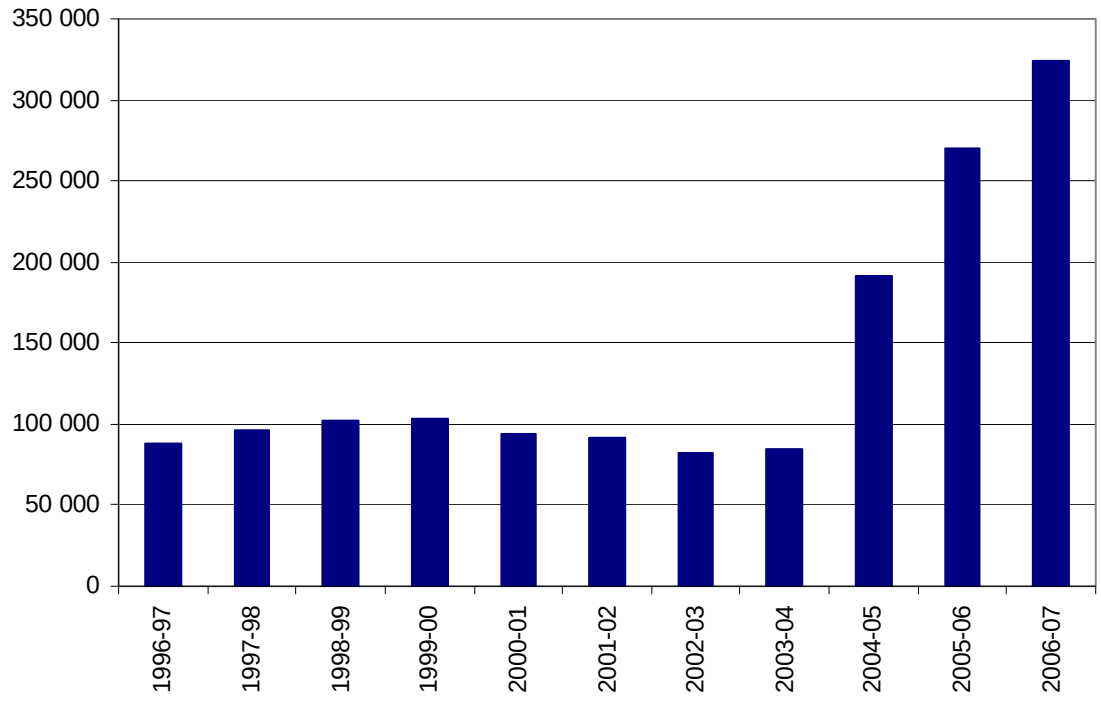
4.1 HISTORICAL GROWTH

4.1.1 PASSENGER TRAFFIC

Council has provided passenger numbers for the 2006-07 financial year. Data for the financial years 1996-97 through to 2005-06 have been obtained from BITRE.

Historical growth for RPT passenger movements for the period 1996 – 2007 are shown in Figure 1 .

Figure 1 Historical Annual Passenger Traffic



Source: BITRE

There was an overall steady positive growth trend for the period 1996-97 through to 1999-00 and although the collapse of Ansett and the ensuing reduction in airline services resulted in some minor discontinuity for the period 2000-01 through to 2002-03, the introduction of low cost carriers (LCC) to the airport has resulted in strong growth since 2003-04.

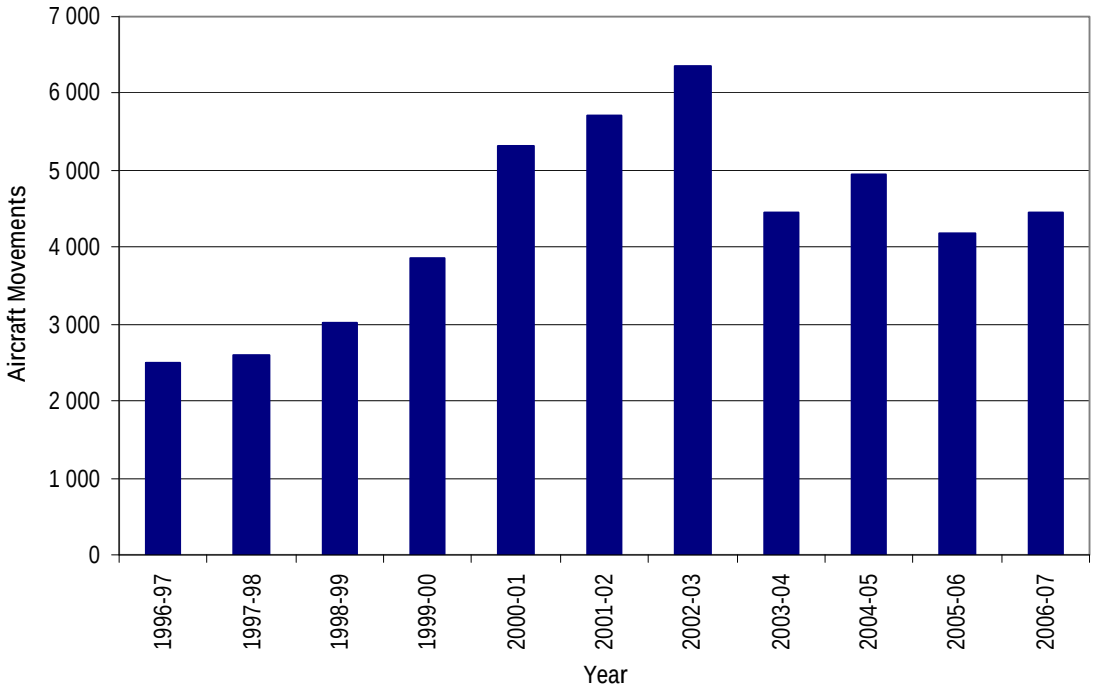
In the year ending June 2007 a total of 325,028 passengers used Ballina Airport. This represents

an increase of 20.5% on 2005-06 traffic. However, data for the first 39 weeks of the 2007-08 financial year indicates a possible period of stagnation in passenger growth when compared the same period in 2006-07.

4.1.2 RPT AIRCRAFT MOVEMENTS

Figure 2 shows annual numbers of RPT aircraft movements at the airport between 1996-97 and 2006-07. The number of movements increased steadily over the period 1996-97 to 2002-03 from 2,501 to 6,366. In contrast to the decline in passenger movements following the collapse of Ansett, RPT aircraft movements actually increased through 2001-02 and 2002-03. Although RPT movements have reduced to pre-2001 levels since 2002-03, this is due to the introduction of low cost carriers such as Virgin Blue and Jetstar operating larger aircraft.

Figure 2 RPT Aircraft Movements 1996-97 – 2006-07

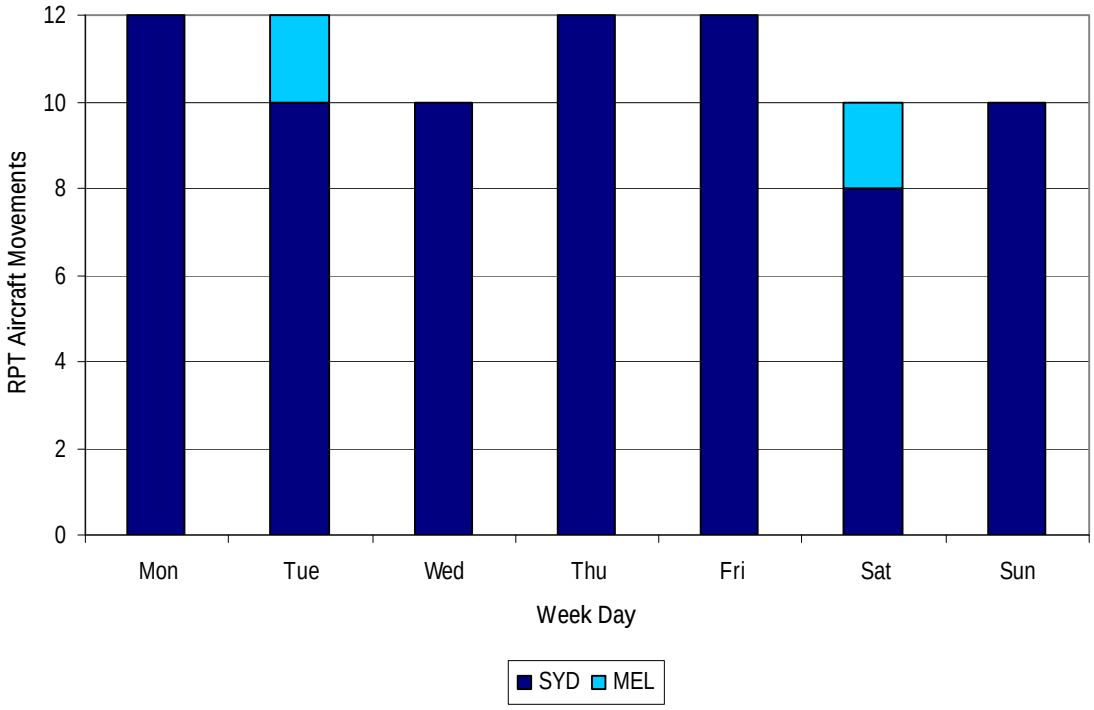


Source: BITRE

Based on the latest airline schedules supplied by Council, there are 80 weekly scheduled RPT aircraft movements serving Ballina Byron Gateway Airport. This equates to 4,160 annual movements.

Figure 3 shows the daily distribution of RPT aircraft movements. With the exception of Wednesdays, week days are the busiest days with 12 movements each day. Saturdays, Sundays, and Wednesdays are slightly less busy with 10 movements each day.

Figure 3 Daily RPT Aircraft Movements



4.1.3 GENERAL AVIATION

General Aviation (GA) activity is made up of all aircraft operations not related to commercial RPT or freight services and includes activities such as aerial work, government business, medical services, charter traffic, flying training and private leisure flying.

Discussions with the Airport Operations Manager and other key GA stakeholders show that GA activity at Ballina Byron Gateway Airport is composed mainly of charter traffic, private flying and flying training. GA activity is generated by local aircraft, visiting aircraft, and itinerant aircraft using the airport as a stopping-off point en-route to some other destination.

Only a small proportion of general activity is conducted by aircraft greater than 5,700 kilograms. For the 6 month period October 2007 to March 2008 approximately 13.7% of all GA traffic activity involved aircraft over this limit.

Inspection of the Australian civil aircraft register (updated May 25 2008) suggests that Ballina Byron Gateway Airport does not have a high resident population of GA aircraft. Only 17 aircraft are currently registered within the local postcode area, however, discussions with GA stakeholders suggest there are approximately 20 resident aircraft.

The Ballina Aero Club has approximately 40 members but discussions with the club President suggest approximately half of the members operate from smaller airfields in the surrounding area and visit the airport only for events or maintenance.

Although there is no data regarding the level of GA activity at the airport, Council was able to supply data collected by AvData Australia for aeronautical charging purposes for the months shown in Table 1

Table 1 AvData Record Periods

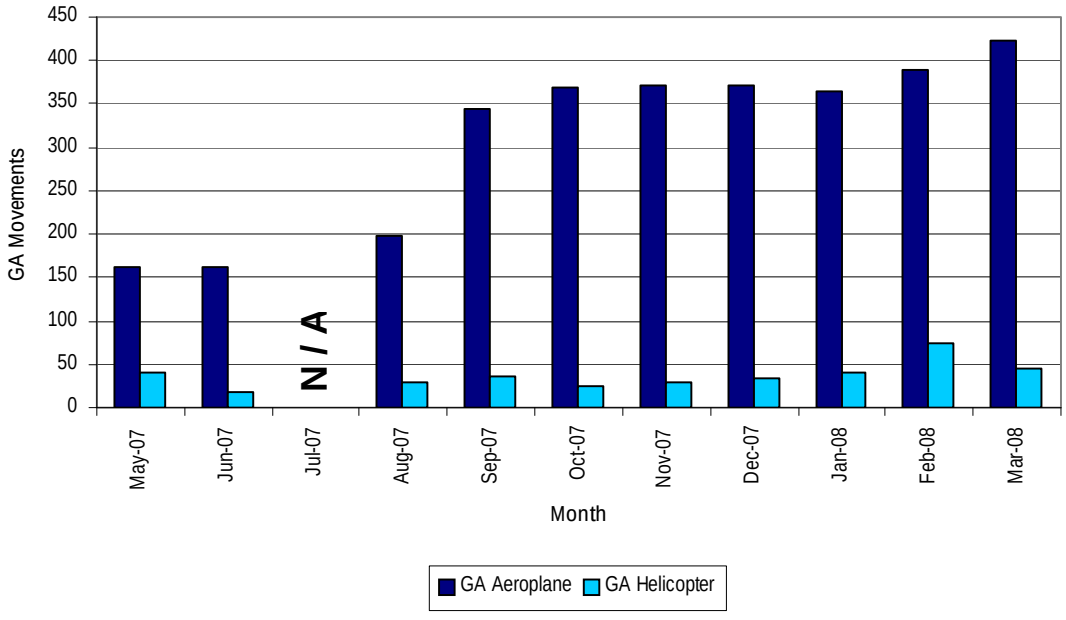
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2004											✓	✓
2005		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
2006	✓	✓	✓	✓	✓		✓	✓				
2007			✓		✓	✓		✓	✓	✓	✓	✓
2008	✓	✓	✓									

In most instances the aircraft registration, aircraft type, time of operation, flight number, status, customer ID, customer name, maximum take-off weight (MTOW), and the charge applied were available for each record. The data was sorted and categorised as RPT, GA aeroplane, and GA helicopter.

However, due to the inconsistency of the months of data provided it is difficult to use the information to describe historical activity over a large period of time.

Figure 4 shows both GA aeroplane and helicopter movements for the period May 2007 to March 2008. Data for July 2007 was unavailable.

Figure 4 GA Movements May 2007 – March 2008



The number of GA aeroplane movements increased steadily over the winter period of May 2007 to

August 2007 from 162 to 197 per month. September 2007 saw a rise in movements to 344 followed by further steady growth to 422 movements in March 2008. GA helicopter movements have remained at relatively constant over the period.

4.2 PROJECTED TRAFFIC

4.2.1 PASSENGER TRAFFIC

The compound annual growth rate (CAGR) for the 10 year period between 1997-98 and 2006-07 is 13.9%. This is one of the highest growth rates amongst similar Australian regional airports for the same period. Growth at this level is no doubt a result of the introduction of LCC to the airport within the last 3 - 4 years.

Table 2 lists RPT passenger traffic for 2006-07 in addition to the 10 year compound annual growth rate (CAGR) at selected Australian regional airports.

Table 2 Selected Passenger Traffic Statistics for Ballina and Other Regional Airports

AIRPORT	ANNUAL PAX 2006-07	CAGR 1997/98 – 2006/07
Mackay	743,321	9.6%
Rockhampton	638,602	7.6%
Ballina	323,791	13.9%
Coffs Harbour	323,565	6.8%
Proserpine	256,282	10.6%
Hervey Bay	189,429	16.7%

Source: BITRE

Further LCC growth in regards to services offered can be expected to continue, at least within the short term. As LCC services at the airport mature, however, a lower annual growth rate is likely.

This pattern of high growth in the short-term followed by a slowing of growth through the medium and long-term is mirrored in passenger traffic forecasts for the Asia-Pacific region. The 2006 – 2026 market outlook conducted by Airbus forecasts annual growth of 7.4% for the region until 2015, followed by a reduction in growth to 5.0% until 2026. The outlook also provided a forecasted annual growth rate of 6.2% for the region and 4.8% globally for the entire 2006 – 2026 period.

In order to form the 'Mid-growth' scenario it has therefore been considered reasonable to assume the airport 10-year CAGR of around 14% will continue for the next 5 years. In addition, the mid-range forecasted Asia-Pacific region average annual growth trend of 6.2% was assumed to be representative of growth at the airport for the remainder of the forecast period.

Although the above 'mid-growth' scenario is considered to be the most likely, it should be

considered that this level of long-term growth may well be unsustainable.

To form the 'low-growth' scenario it was assumed passenger growth at the airport would parallel the stepped forecasted growth for the Asia-Pacific region discussed earlier. Therefore an annual growth rate of 7.4% was chosen to represent growth until the end of the 2012-2013 financial year whilst the lower forecasted growth rate of 5.0% was applied for the period 2013-14 to 2027-28.

In order to develop the 'high-growth' scenario it is reasonable to assume the annual growth rate of 20% experienced between 2005-06 to 2006-07 will continue within the short-term to 2012-13. The highest forecasted growth rate for the Asia-Pacific region of 7.4% was then applied for the remainder of the forecast period

The purpose of the 'High-growth' scenario is to represent the highest traffic levels on which planning decisions about facility requirements will be made. Therefore, although the traffic levels predicted by this scenario are considered feasible under the right combination of circumstances, they should be considered as relatively unlikely to occur in practice.

Table 3 Average Annual Growth Rates

SCENARIO	AVERAGE ANNUAL RPT PASSENGER TRAFFIC GROWTH 2008/09 – 2012/13	AVERAGE ANNUAL RPT PASSENGER TRAFFIC GROWTH 2013/14 – 2027/28
Low-Growth	7.4%	4.8%
Mid-Growth	14.0%	6.2%
High-Growth	20.0%	7.4%

The resulting forecast passenger numbers for the next 20 years are given in Table 4

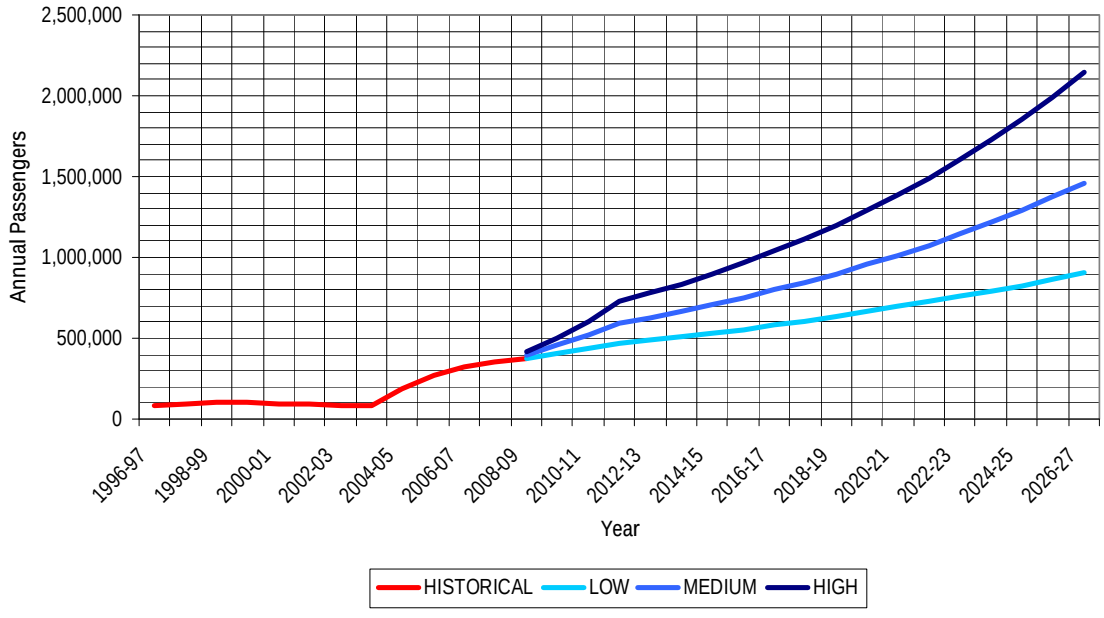
Table 4 Forecast Passenger Traffic

YEAR	SCENARIO		
	LOW-GROWTH	MID-GROWTH	HIGH-GROWTH
2008-09	375,610	398,322	419,286
2009-10	403,781	454,087	503,143
2010-11	434,065	517,659	603,772
2011-12	466,620	590,131	724,526
2012-13	487,617	626,719	778,866
2013-14	509,560	665,576	837,281
2014-15	532,490	706,842	900,077
2015-16	556,453	750,666	967,582

YEAR	SCENARIO		
2016-17	581,493	797,207	1,040,151
2017-18	607,660	846,634	1,118,162
2018-19	635,005	899,125	1,202,025
2019-20	663,580	954,871	1,292,176
2020-21	693,441	1,014,073	1,389,090
2021-22	724,646	1,076,945	1,493,271
2022-23	757,255	1,143,716	1,605,267
2023-24	791,332	1,214,626	1,725,662
2024-25	826,941	1,289,933	1,855,086
2025-26	864,154	1,369,909	1,994,218
2026-27	903,041	1,454,843	2,143,784
2027-28	943,678	1,545,044	2,304,568

Figure 5 shows historic passenger figures for the period 1996-97 to 2007-08 compared to forecasted passenger figures for each scenario project to 2027-28.

Figure 5 Forecast Passenger Traffic



Assuming a load factor of 90% for LCC and 75% for regional airlines such as Rex, the number of forecasted annual passenger movements for the mid-growth scenario in 2027-28 equates to

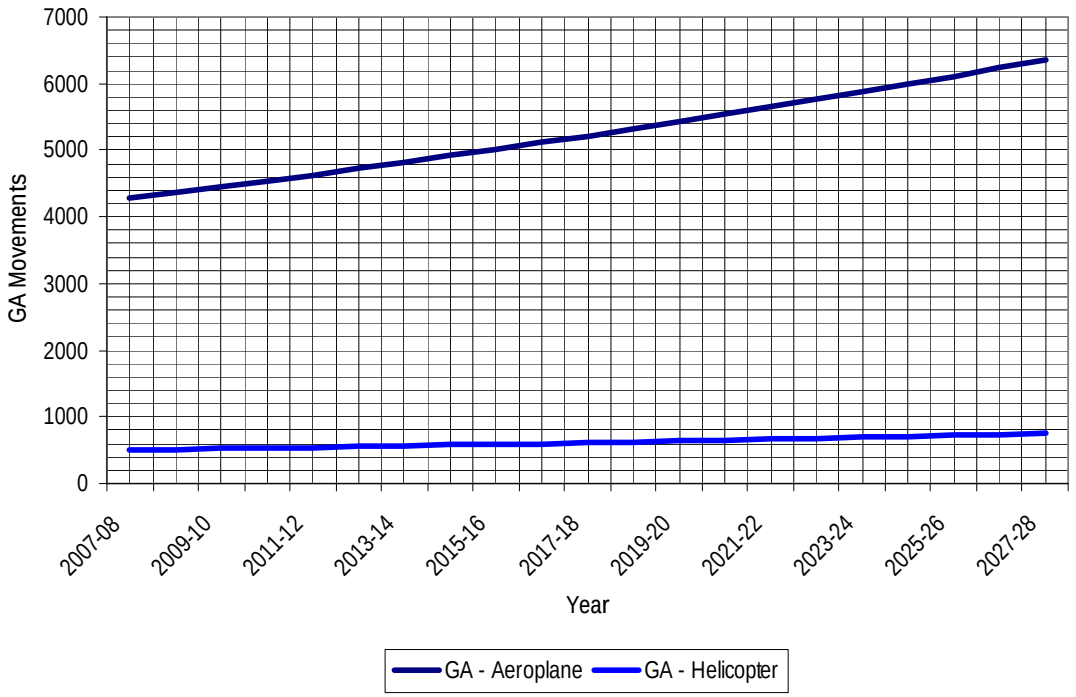
approximately 12,400 movements per annum or 34 movements per day. This is almost a tripling of RPT movements compared to the number currently experienced. Consideration of likely future airline schedules suggests this level of RPT traffic could result in up to 4 Code C aircraft on the ground at one time.

4.2.2 GENERAL AVIATION

Council population projections indicate Ballina Shire is expected to grow at a compound annual average growth rate (CAGR) of 1.9% between 2001 and 2026[1]. Assuming that population growth in the Ballina area is a reasonable proxy for private GA activity at Ballina Byron Gateway Airport and applying a further growth rate to account for a further increase in visiting private GA aircraft we can apply a conservative, CAGR of 3.0% to current private GA movements. This includes both aeroplanes and helicopters.

Figure 6 shows projected general aviation aeroplane and helicopter movements for 2008-09 to 2027-28.

Figure 6 Forecast General Aviation Movements



There are approximately 4,000 GA aircraft and 500 helicopter movements a year currently. Assuming a CAGR in the private GA movements of 3.0% per year to 2027-28, approximately 7,200 aircraft and 750 helicopter GA movements by 2027-28 can be expected. This kind of growth rate is

[1] Ballina Shire Council (2008). *Ballina Shire Facts & Figures 2003 – Demographic Characteristics.*

consistent with long-term trends in general aviation activity nationally.

Using the current proportion of resident aircraft movements to those visiting the airport, forecasted growth corresponds to approximately a doubling of resident GA aircraft to 40 and 5 resident helicopters.

5.0 FUTURE FACILITY REQUIREMENTS

5.1 CROSS RUNWAY

5.1.1 WIND ANALYSIS

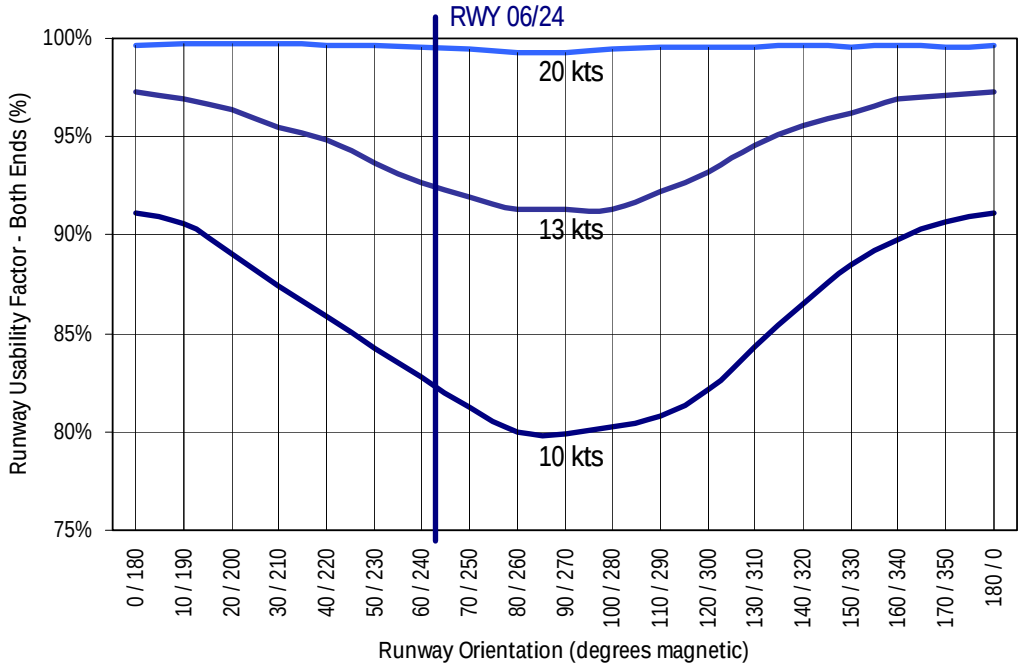
The International Civil Aviation Organisation (ICAO) recommends that historical wind data covering at least 10 consecutive years be used to determine the estimated proportion of time that a particular runway will be usable by aircraft. To ensure the wind data was representative of long-term wind patterns for the region, the wind analysis was conducted using Bureau of Meteorology historical wind speed and direction data taken twice daily for Ballina Airport AWS (Station 058198) for the period 19 November 1992 to 30 April 2006.

The extent to which a runway is usable is dependent on the crosswind limit applicable to the operating aircraft. ICAO specifies three crosswind limits of approximately 10 knots, 13 knots and 20 knots, dependent on the aircraft type and runway surface condition. A 10 knot crosswind limit is appropriate to light aircraft types (less than 5,700 kg).

ICAO recommends a minimum runway usability factor of 95% for an aerodrome. However, this is not an absolute requirement but rather a guide to the acceptable level of usability factor.

The percentage of time aircraft could land or take-off in either direction from a runway oriented on a selected bearing for different aircraft limiting crosswind components is shown Figure 7 .

Figure 7 Usability - Single Runway (Both Ends)



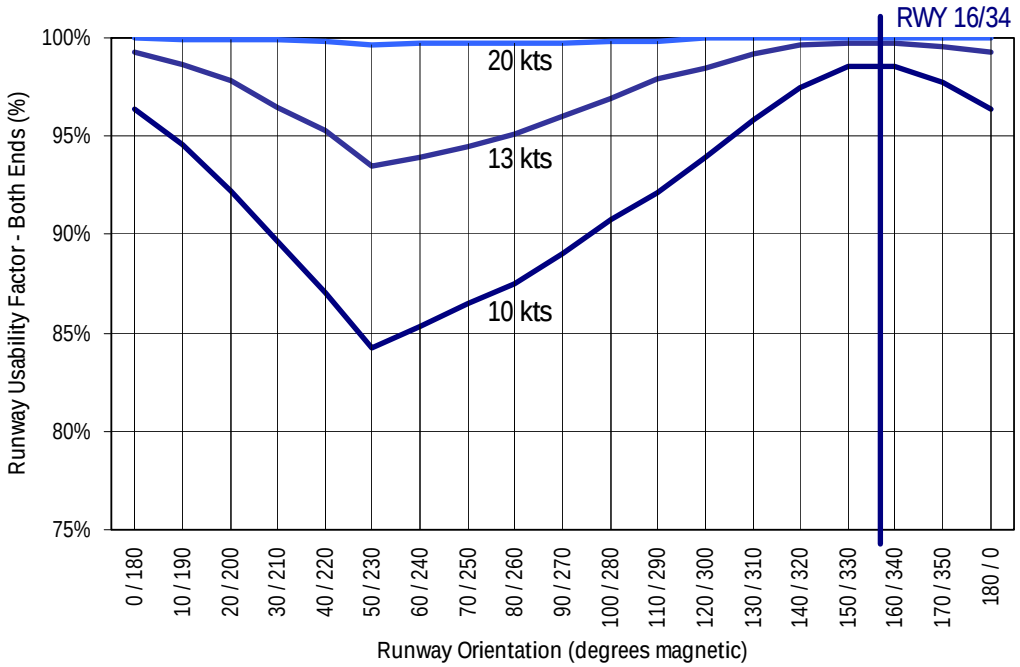
Analysis of wind conditions shows that the optimum runway direction is 03/21 with 21 being the preferred runway. It would provide very close to 100% usability in 20 knot crosswind conditions.

The existing 06/24 runway provides similar usability in 20 knot crosswind conditions (between 99 and 100%) with runway 24 being the preferred direction. The existing single runway configuration is therefore adequate for all aircraft types forecast to be used in RPT operations.

The runway usability for light aircraft with a 10 knot crosswind limitation on the same runway reduces to 83% for day-time operations. A second or crosswind runway is therefore required to provide the recommended 95% usability for these aircraft types.

The total percentage of time aircraft could land or take-off in either direction from the existing runway 06/24 combined with landing or taking-off in either direction from a runway oriented on a selected bearing for different aircraft limiting crosswind conditions is shown in Figure 8 .

Figure 8 Usability - Two Runways (Both Ends)



Analysis shows that the optimum direction for a cross runway would be approximately 16/34. However, the overall usability will be maximised if the cross runway is oriented in the range 150-180° Magnetic.

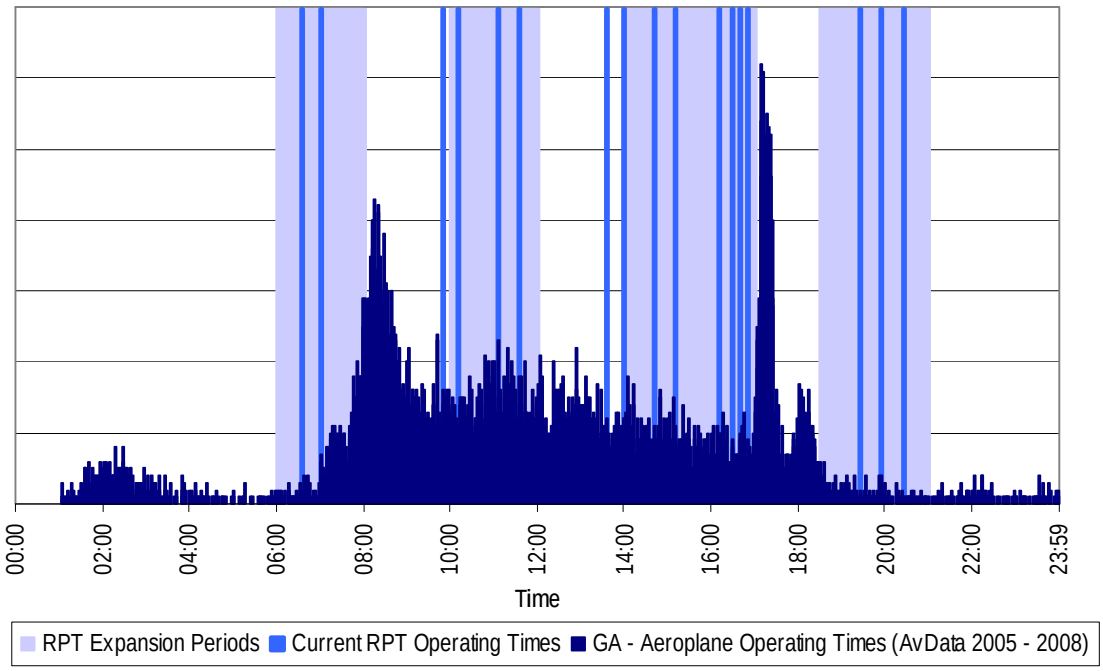
Although a day-time runway usability of 83% for light aircraft would suggest the need for a crosswind runway to achieve an estimated usability factor of 95%, consultation with GA stakeholders suggests the current disruption caused by crosswinds exceeding limits for light aircraft is relatively minor.

5.1.2 CAPACITY ANALYSIS

An additional indicator for the requirement of a cross runway is the amount GA activity and RPT operations interfere with each other.

Figure 9 shows historical AvData GA – Aeroplane movement times for the periods specified in Table 1 compared to the current scheduled RPT operating times and the periods future RPT expansion is expected to operate within.

Figure 9 GA and RPT Operations by Time of Day



The peak times for general aviation activity occur in the morning and in the afternoon, as might be expected. Although the morning peak does not interfere with current RPT operations, the afternoon peak does appear to occur directly after RPT activity and could be affected by any delay to the RPT operations. The majority of RPT operations occur between 09:50 and 16:50 when GA activity is somewhat lower than at peak time but of a consistent level.

Consultation with GA stakeholders suggested GA and RPT aircraft currently interact well with one another with little delay.

However, RPT traffic is expected to expand around the current peak periods as Figure 9 shows. Although this should not present a problem for day time operations, the morning and afternoon RPT peak periods begin to encroach on peak GA activity periods. This could result in increased levels of delay to GA aircraft and make the airport unfavourable to additional general aviation and commercial growth.

5.1.3 COST BENEFIT ANALYSIS

The provision of a 780 metre long, 18 metre wide, natural surface Code 1B non-instrument runway for daylight hours operations only, as envisaged in the 2002 Airport Development Strategy, could cost in the order of $750,000 (significantly more if extensive earthworks or sub-grade strengthening is required), ignoring land acquisition costs. Operating costs might be in the order of $5,000 per year.

The principal beneficiaries of the availability of the cross runway would be private light aircraft users. Such users, although important to regional airports such as Ballina Byron Gateway, traditionally provide relatively low levels of revenue. It would therefore be difficult to justify the investment in a cross runway without passing the associated costs on to light GA aircraft users.

Assuming Council wishes to recover the cost of the cross runway over 15 years using an average cost method. Assuming an annual interest rate of 10%, the average annual cost of providing the cross runway would be closer to $215,000. Based on recent historical GA aircraft movement numbers of 2,000 landings at an average MTOW of 1,750kg (from AvData records) this would require an equivalent landing fee of around $62 per tonne MTOW just to pay for the cross runway. Clearly, this would be prohibitive by any standards. However, the current airport charging structure for GA users operates on an annual charge set at a level that would only recover about 10-15% of the annual costs associated with a cross runway, based on the number of resident aircraft.

5.1.4 LOCATION

The 2002 Ballina Airport Development Strategy provided for a possible 780m x 18m cross runway oriented 16/34 to accommodate maximum Code 1B aircraft with an MTOW of less than 5700kg.

Although wind analysis confirms the orientation of the proposed cross runway remains valid, the 2007 Ballina Airport Cross Runway Desktop Assessment highlighted the original proposed location for the cross runway did not allow for a suitable separation distance from the runway to heavily forested Zone 7(a) or protected wetlands areas located to the north of the airfield. The assessment also reiterated that a cross runway less than 750m in length would be insufficient for many aircraft types and severely limit any benefit gained from its provision.

To accommodate the required separation and to maximise the area available for GA development the location for a possible future cross runway would need to be shifted slightly south and as far east as possible, close to Cork's Hill, taking into consideration the height of the hill in relation to the transitional surface. The revised location would require the runway to infringe on privately owned land to the south of the airport within which the development of an aged care community is proposed.

Positioning a possible future cross runway further west would divide the airport and require the southern end of the runway to infringe on off-airport land set aside for industrial development by Council.

5.1.5 CONCLUSION

The costs of providing even a basic cross runway are likely to be prohibitive to GA users if passed on in full. There currently appears to be only minor disruption to GA users as a result of the single runway, however, this is likely to increase as RPT traffic grows. Nevertheless, the lack of a suitable location makes the provision of a cross runway now or in the future unfeasible and it is therefore no longer considered sufficient warrant to maintain its provision within the development strategy.

5.2 TAXIWAYS

The taxiway layout envisaged in the original 2002 development strategy remains appropriate for the proposed development layout. The proposed partial parallel taxiway will provide access to the main GA development areas as well as increasing the peak capacity of the 06/24 runway.

With the removal of the cross runway from the strategy the partial parallel taxiway should be extended as far east as possible to provide access closer to the Runway 24 threshold and maximise the amount of space available for development.

The extension of the parallel taxiway west from the RPT apron cannot be accommodated until relocation of the GA facilities to the proposed development precincts discussed in Section 5.6 has been completed.

5.3 ATC

In accordance with the draft MOS Part 71 – Airspace, forecasted movements for the mid-growth scenario suggest that an aeronautical study into the provision of an Aerodrome Control Service will not be required within the strategy period. However, the provision of a Certified Air/Ground Radio Service (CA/GRS) will need to be assessed in the mid-growth scenario when forecasted RPT movements exceed 7,500 per annum, around 2018-19.

The proposed location for the CA/GRS station is on top of Corks Hill. The elevation of the hill would reduce the height of facility construction required and provide the necessary view of the movement areas for the station operator.

5.4 NAVAIDS

The route of the proposed partial parallel taxiway and the close proximity to the proposed development precincts discussed in Section 5.6 would prevent the NDB from remaining in its current position. Dependant on the time frame in which development in the area of the NDB occurs it may prove suitable to remove the NDB in favour of newer technology.

The NDB is owned by the Council and is not on the Airservices Australia list of terrestrial navigation aids that are to remain in service as a backup to the Global Navigation Satellite System (GNSS) if the Automatic Dependent Surveillance Broadcast (ADS-B) Low Level Airspace program goes forward.

The airport must be served by a minimum of two navigation aids for which independent and separate instrument approaches have been published and aircraft must be fitted with two independent and separate radio navigation systems each of which are capable of using the navigational aids as published by the Civil Aviation Safety Authority (CASA) in paragraph 73.3 of the AIP.

The airport currently operates an NDB approach procedure plus an RNAV (GNSS) non-precision instrument approach procedure for both runway 06 and 24. If the NDB is removed all IFR traffic will need to be equipped with dual IFR GNSS receivers. New generation aircraft such as the B737-800 should meet this requirement however smaller regional aircraft may require an upgrade of their avionics package.

An issue that may influence the outcome of the decision at a later date is the possibility of the Australian Government subsidising the equipping aircraft with ADS-B to enable the ADS-B program to achieve its aim of replacing radar as the basis for ATC separation and replacing most of the terrestrial navigation aids used by RPT, Charter and GA aircraft.

5.5 RESCUE AND FIRE FIGHTING SERVICES

Within the short-term the airport will surpass 350,000 passengers per annum and require the provision of Aerodrome Rescue and Fire Fighting Services (ARFFS) at Level 1 coverage in accordance with MOS Part 139H – Standards Applicable to the Provision of Aerodrome Rescue and Fire Fighting Services.

As the critical aircraft are currently Boeing 737 and Airbus 320 type aircraft an ARRFS Aerodrome Category of 7 and a minimum of 2 ARFFS vehicles will apply. This category provides for aircraft up to 49m in length and thus forecasted traffic does not dictate the requirement for expansion of ARFFS within the strategy period.

A suitable location for an ARFFS station is in the area between the terminal reserve and commercial GA precinct. This location would be likely to provide response times in accordance with MOS Part 139H and rapid access to the landside road system.

5.6 GENERAL AVIATION FACILITIES

5.6.1 OVERVIEW

There are 12 lots of land varying in area from 287m^2 to 1350m^2 available for lease from the Council within the existing GA area. Of the 12 lots available 10 under lease agreement and contain privately owned hangars, the remaining 2 remain undeveloped.

The Aero Club lease agreement has expired and the club is seeking to relocate their club offices to a portion of decommissioned taxiway close to the old western airside access gate and subdivide their existing site to reduce land take. The remainder of the lease agreements range in expiration

from 2010 to 2016 for existing developed sites and 2022 for the undeveloped lots.

Consultation with stakeholders revealed that at least one existing tenant is interested in securing land on which to construct hangar and office facilities. There is a general feeling that there is an even greater underlying demand for private hangar sites that has been suppressed due to the perception that no space is available, although the true extent of demand will only be confirmed when the time comes for interested parties to commit to the cost of the hangars and sites.

In order to provide flexibility for future development the strategy envisages the development of general aviation facilities into the intervening area between the existing terminal precinct and Cork's Hill.

The proposed location will centralise GA facilities and provide the space required to meet forecasted private and commercial demand. Under the strategy the site has been subdivided into 3 individual precincts; Private Light Aircraft, Helicopter, and Commercial General Aviation.

Drawing A08071A001 included at Appendix B shows the proposed development concept.

5.6.2 PRIVATE AND LIGHT AIRCRAFT

The proposed private light aircraft precinct is situated at the eastern end of the available space between the terminal precinct and Cork's hill. This location provides benefits to users with convenient mid-field access to the existing runway. This location is also well separated from the existing and future RPT apron areas, minimising safety and security risks associated with the close proximity of the different types of operation.

The precinct will allow for the provision of 48 15m x 15m to accommodate all aircraft within the current and envisaged GA fleet, or alternatively to house two ultra-light aircraft types, and thereby maximise the flexibility and commercial attractiveness of the hangars. While hangar demand develops any undeveloped portions of the precinct can be used for itinerant light aircraft parking. The strategy allows for access to the hangar developments via Code B taxiway rather than Code B taxi lane in order to preserve the flexibility of the area in the long-term.

It is assumed that the hangars would be in the form of one or more single structures separable by partitions to avoid the need for large fire separations between individual hangars and allow for customisation of hangar space.

It is envisaged that the hangar structures would either be developed by the airport operator and leased to tenants, or constructed by groups of tenant on land leased from the airport operator. These methods are used widely amongst other Australian regional airports. The proposed layout allows for landside road access to be provided to each hangar from the proposed access road.

There is an option to use the land adjacent to the existing GA area currently occupied by a bike track for short-term GA expansion once the lease expires in 2010. The current airside GA facilities could be relocated into the reacquired land. This would minimise the safety and security risks

associated with the existing location and allow for the provision of landside access and expansion of the hard stand aircraft parking area.

However, the size of the area would greatly limit the airport's ability to provide for new development opportunities and is not considered a long-term solution. It is recommended that any developments in this area are made under short-term lease agreements and that the objective remains to relocate the GA area to the east once it is financially viable.

5.6.3 HELICOPTERS

The strategy allows for a helicopter precinct to accommodate the expansion of existing helicopter operators at the airport and the increasing amount of visiting helicopters. Additionally, a helicopter aiming point is proposed within a suitable site directly opposite the precinct.

There are operational benefits to be realised from the concentration of rotary wing activity within a single precinct. Development of this precinct could form the catalyst for the development of the adjacent commercial GA precinct for fixed-wing operators.

Use of the bike track land to the west as an option for short-term development discussed in the previous section extends to helicopter operations. Helicopters could continue to operate as they do currently within the area until there is a financial justification to begin development of the proposed helicopter precinct.

5.6.4 COMMERCIAL GA (FIXED-WING)

The proposed future commercial fixed-wing GA precinct is located in the area between the terminal and helicopter precincts and will provide space for commercial GA businesses and aviation support industries.

It is envisaged that this precinct would house flight training organisations, aircraft maintenance and overhaul businesses, fixed base operators and other commercial aviation businesses.

To assist in offsetting the costs of preparing the area for development, including the provision of road access and services to the proposed helicopter and private and light aircraft precincts it is recommended that any future developments to accommodate commercial (as opposed to private) GA users occur within this area.

5.6.5 VISITING CORPORATE AND CHARTER AIRCRAFT

There is currently a small hardstand aircraft parking area capable of accommodating 2-3 Code B aircraft adjacent to the RPT apron.

Discussions with the Airport Operations Manager and other stakeholders suggested the hardstand aircraft parking area currently provided is becoming increasingly inadequate due to the growth in visiting aircraft, including corporate jet traffic and helicopters.

The relocation of GA facilities to the east provides space for expansion of the existing hard stand parking area to accommodate visiting corporate and charter aircraft according to demand. Expansion of the existing area will also maintain a close proximity to the terminal and amenities.

If deemed viable, a small terminal building incorporating passenger processing and flight planning facilities for use by visiting charter and corporate operators could be provided in the future.

6.0 CONCLUSIONS

This airport development strategy update has reviewed the future facility requirements and preferred long-term land-use arrangements at Ballina Byron Gateway Airport with particular reference to general aviation (GA) facilities.

A concept layout of the revised development strategy is shown on Drawing A07081A001 included at Appendix B.

Analysis of operational need and conceptual cost-benefit analysis indicates that the provision of a cross runway to accommodate light aircraft in cross wind conditions is unwarranted on economic grounds. Combined with the absence of a suitable location for a cross runway, it is not feasible to continue to safeguard for the provision of a possible future cross runway within the development strategy.

The taxiway layout envisaged in the original 2002 development strategy remains appropriate for the proposed airfield layout. The removal of the cross runway from the strategy has resulted in slight alterations to the manner in which the taxiway interfaces with the existing runway 06/24.

It is recommended that GA facilities are redeveloped within the area between the terminal building and Corks Hill. Facilities for private light aircraft should be located at the eastern end of this area as this arrangement maximises separation between light aircraft users and the RPT apron, which is both a safety and security consideration.

The strategy allows for a helicopter precinct adjacent to the private light aircraft precinct to accommodate the expansion of existing helicopter operators at the airport and the increasing amount of visiting helicopters.

A proposed future commercial fixed-wing GA precinct is located in the area between the terminal and helicopter precincts and will provide space for commercial GA businesses and aviation support industries.

As the gradual relocation of GA facilities to the proposed long-term development area provides space for expansion of the existing hard stand parking area to accommodate visiting corporate and charter aircraft according to demand.

APPENDIX A

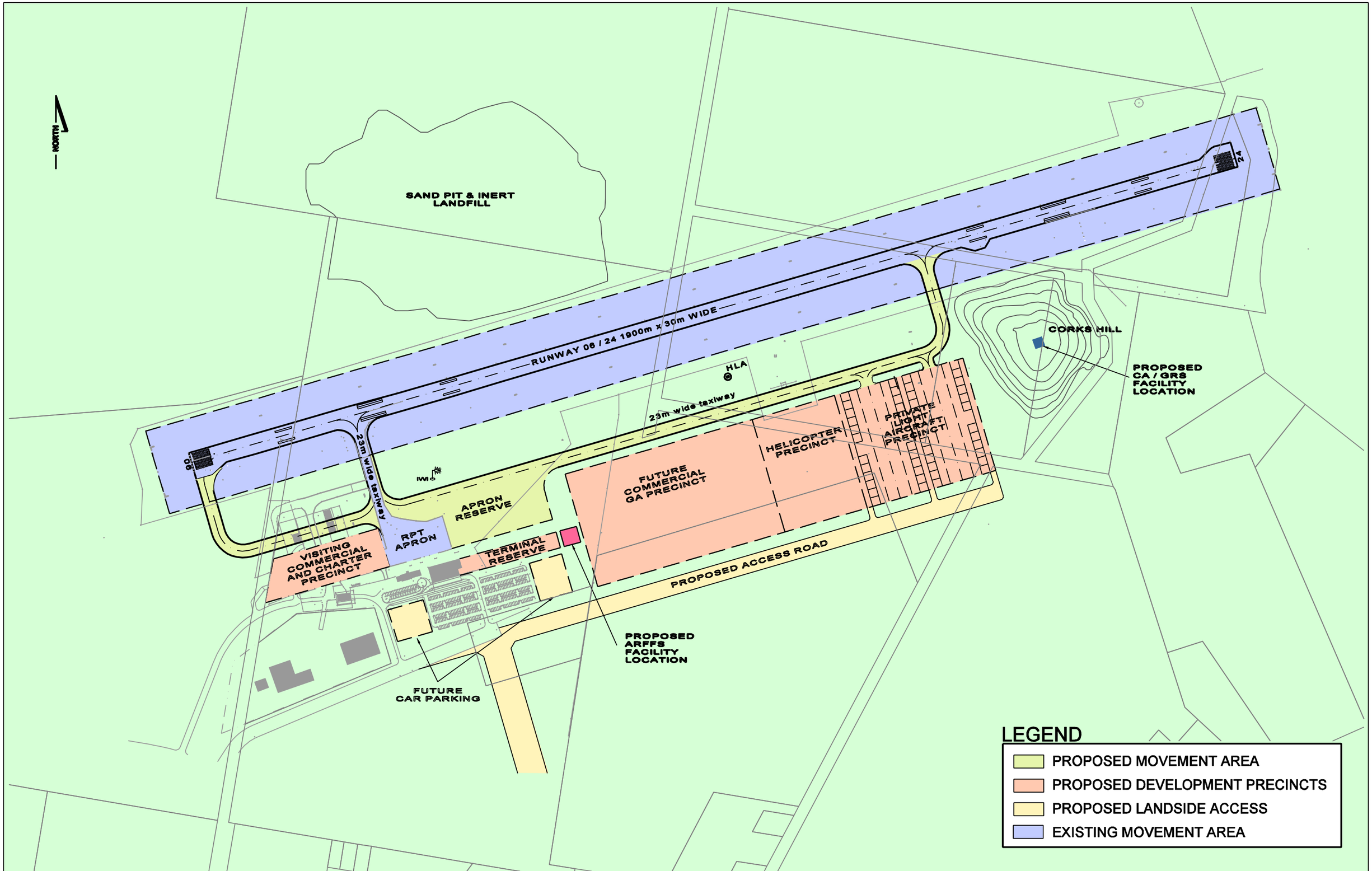
CONSULTATION SCHEDULE

Table A-1 List of Consultees

ORGANISATION	REPRESENTATIVE	POSITION	CONTACTED	DATE
Ballina Shire Council	Graeme Gordon	Airport Operations Manager	In Person	9 May 2008
	John Truman	Group Manager Civil Services		
	Alan Brown	Councillor		
Reds Flying School	Mr Wayne Dwyer	Owner / Pilot	In Person	9 May 2008
Ballina Aero Club	Mr Gary Faulks	President	In Person	9 May 2008
Air T & G	Ms Georgie Bagshaw	Owner / Pilot	By Telephone	12 May 2008

APPENDIX B

CONCEPT DEVELOPMENT PLAN



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0	04-06-08	A.M.	DRAFT ISSUE	M.W.

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Project: BALLINA BYRON GATEWAY AIRPORT DEVELOPMENT STRATEGY REVIEW

Title: CONCEPT DEVELOPMENT PLAN

Client: *BALLINA BYRON GATEWAY AIRPORT*

Draftsperson:	Checked:	Sheet Size	Drawing No.
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Designer: A.M.	Approved: B.H.		
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