CASSOWARY COAST REGIONAL COUNCIL
AIRPORT DEVELOPMENT – STAGE TWO
MUNDOO AIRPORT MASTERPLAN
(INNISFAIL AERODROME – R133)

Summary Report by:
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- AITS – Aerodrome Consulting
- Thirkell Consulting Engineers
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- MUNDOO AIRPORT MP 2013 RUNWAY OPTIONS OLS SURVEY SPECIFICATIONS – AITS & AIRPORT SURVEY CONSULTANTS, 19 JANUARY 2013

- INNISFAIL WIND ANALYSIS, GHD FOR CUMMINGS ECONOMICS, JANUARY 2013
ABBREVIATIONS

AIP – Aeronautical Information Publication  
AITS – Aerodrome Inspection and Training Services  
ANEF - Australian Noise Exposure Forecast  
AOC- Air Operators Certificate  
ARFL - Aerodrome Reference Field Length  
ASIC - Australian Security Identification Card  
CASA – Civil Aviation Safety Authority  
CASR – Civil Aviation Safety Regulation  
CCRC – Cassowary Coast Regional Council  
CE - Cummings Economics  
DME – Distance Measuring Equipment  
ERSA – En Route Supplement Australia (to the AIP) (note gives technical details of aerodromes)  
GA – General Aviation  
GFC – Global Financial Crisis  
GNSS – Global Navigation Satellite System  
GPS – Global Positioning Satellite  
FIFO – Fly In Fly Out  
ICAO – International Civil Aviation Organization  
IFR – Instrument Flight Rules  
Kpa - Kilopascels  
MOS – Manual of Standards  
MTOW – Maximum Take Off Weight (kg)  
NDB – Non – Directional Beacon ground based aviation navigational aid  
NGA – New Generation Aircraft  
OLS – Obstacle Limitation Surface  
PCN – Pavement Classification Number  
PNG – Papua New Guinea  
RESA – Runway End Safety Area  
RPT – Regular Public Transport  
TCE – Thirkell Consulting Engineers  
VOR - VHF omnidirectional radio range

REFERENCES

- Cassowary Coast Aerodrome Demand & Management Study – Cummings Economics for Cassowary Coast Regional Council, June 2011.
1.0 BACKGROUND

1.1 Background

In January 2013, Cassowary Coast Regional Council commissioned a team led by Cummings Economics to develop Three Options for a Master Plan for Mundoo Aerodrome Innisfail. At the same time, Cummings Economics undertook to develop a parallel Commercial Plan to address questions of management, charges and revenue sources for the aerodrome.

As part of the process, Cummings Economics were to report to a Steering Committee of Council Officers to present the three draft Options with a view to finalizing them for presentation to Council. A Technical Report setting out three options was presented to the Steering Committee on 20th May 2013.

Following this meeting, Cassowary Coast Regional Council requested the team to finalise the project with a Mundoo Airport Masterplan document based on the information researched in the Technical Report and the Commercial Plan.

Thanks is extended to the Airport Users Group and individual airport users for their enthusiastic contribution to the process.

This report is based on the following investigations and reports:

1) Demand Study – Cassowary Coast Aerodrome Demand and Management Study – Cummings Economics, June 2009;

1.2 Location, Layout & Reference Terminology

Mundoo Airport, also known and registered as Innisfail Aerodrome – R133, is located approximately 4.2km south/south west of Innisfail GPO. Map #1 shows reserve boundaries. Map #2 shows important features and names.

The airport is composed of two runways:

= The main sealed runway (14/32) runs from north-west to south-east, into the major prevailing winds from the south-east;

= The grass cross strip (03/21) runs from the south-west to the north-east into winds that can occur during periods of the summer months from the north and north-east.

Because of the cross strip configuration, land adjacent to the airport tends to fall into four sectors.
Eastern Sector is the location of the current main hangar development and Tarmac Apron next to Mundoo Village. The Eastern Sector is made up of the South-eastern Sector including Mundoo Village and the existing main airport facilities and the North-eastern Sector.

Southern Sector has access via Cardier Road, to a private hangar development outside the airport boundaries, but fronting onto the intersection of the main runway and grass strip.

Western Sector is where current parachute activities are based in a private house next to the grass strip.

Northern Sector is where Council also owns an old disused dump site.
Map #2 – Airport – Important Features
Other important features and reference points include:

- Bamboo Creek running alongside the Western Sector and across the northern side of the airport.
- Aerodrome Road running in from the main Innisfail/South Johnstone Road located to the east.
- Mundoo Road running along the eastern side and around the southern end of the airport.
- Cardier Road that runs south to Wangan to join the Innisfail/South Johnstone Road.
- Mundoo School on the junction of Cardier and Mundoo Roads.
- Wilson Road running around the western side of the airport.
- Douglas Road running along the eastern side of the airport.
- The main Cairns to Brisbane North Coast Railway line running along the eastern side of the airport.

On the airport are three important aeronautical facilities:

- The airport Tarmac Apron (sealed apron for parking of aircraft) and terminal in the Eastern Sector - main runway frontage.
- The NDB (Non Directional Beacon) – an aviation navigational aid in the Eastern Sector.
- The windsock in the Northern Sector at the intersection of the main runway and grass strip.

Other local names are:

- The “Motel” series of small hangars - Eastern Sector grass strip frontage.
- The “Dog Track” - Eastern Sector grass strip frontage – an old greyhound racing track within the airport boundaries.

1.3 Physical Context & Constraints

1.3.1 Topography and flooding
Mundoo Airport is located on higher ground on the coastal plain of the North and South Johnstone Rivers. Map #3 illustrates how this topography plays out in terms of location of high hazard flooding in the vicinity of the airport. The land at the northern end of the main runway (14/32) drops off quite sharply to the east, north, and along the western side. Bamboo Creek acts as a constraint to major runway expansion plans.

1.3.2 Waterways
Bamboo Creek to the west and north acts as a constraint. While possible to overcome with earthworks, there are environmental as well as considerable cost implications. Bamboo Creek has an added impediment in the form of vigorous tree growth that needs a management plan to safeguard flight paths and the safety of the airport.

1.3.3 Roads and rail
Wilson Road acts as a constraint to extending the grass strip to the south-west. Mundoo Road and the main North Coast Railway line act as a constraint to extension of the main runway to the south-east and the grass strip to the north-east.
Map #3 – Draft Flood Hazard Overlay
There is a good road access into the Eastern and Southern Sectors and reasonable access into the Western Sector. Current access to the Northern Sector is circuitous, unsealed and does not extend into the strip frontage.

The existence of the cross strip limits road access between the different sectors, especially between the Eastern and Northern Sectors and the Western and Northern Sectors.

1.3.4 Wildlife and vegetation
The airport is fenced with three-strand barbed wire. However wallabies can manoeuvre through and cause hazards which could only be removed through mesh fencing dug into the ground.

Vigorous tree and banana plantation growth in the area means that frequent inspection and attention is needed to avoid penetration of the critical OLS (Obstacle Limitation Surface) approach, takeoff and transitional surfaces.

1.3.5 Wind
As part of the Master Planning process, a wind analysis was carried out by GHD consultants. The following diagram illustrates the annual wind rose. Full detail are provided in the Technical Documentation.

Diagram – Annual Wind Rose

The Wind Analysis report concluded that winds above 10 knots for the primary runway are almost exclusively from the south-east (refer diagram), with an optimum wind direction between magnetic 120 and 150 degrees. This confirms the primary runway alignment of 145 degrees magnetic.
1.4 Aviation Context and Constraints

1.4.1 Aerodrome classification

Aviation and airports in Australia operate in a robust regulatory environment, especially when regular public transport (RPT) passenger carrying aircraft are involved.

There are three classifications of aerodromes as laid down in the Civil Aviation Safety Authority (CASA) Manual of Standards (MOS):

- Other (unregistered and uncertified), (eg. Dunk Island);
- Registered (eg. Mundoo);
- Certified (eg. Cairns).

When the aerodrome plans to attract regular passenger services, either RPT or FIFO or any other regular charter services, by aircraft carrying 30 or more passengers, the aerodrome must become “Certified”. Qantas Link has advised they will not consider operations at Mundoo unless the aerodrome is certified. This will involve a number of more stringent operational and safety inspection requirements.

1.4.2 Security

One important requirement affecting the development of this Master Plan is that the airport will be classified as an ‘unscreened security controlled airport’ once regular RPT operations of aircraft 30 passengers or more are programmed. This is a Federal Government requirement to protect the travelling public and cargo services from potential life threatening security incidents. This will require the following major changes to the airport:

- The defined ‘airside’ area will require the installation along the boundary line of 2.4m high security mesh fencing with barbed wire strands at the top, appropriately signed and inspected daily. (Once daily is normally sufficient for fence unless specific problems e.g. animals, may need more serviceability inspections.)

- An access control system will be required to restrict airside access to airport staff who hold an authorised security pass (ASIC) or who are accompanied by an ASIC holder. These will include all airside tenants, service providers and trainee pilots.

- All airside access points (ie through the terminal, gates), will need to be controlled, eg. by swipe card access or whatever the new technology is being used.

- A procedure and process for the identification of prohibited items and detection of unauthorised persons airside.

- A response system to deal with the detection and resolution of a suspicious activity.

- Development of a security culture and staff awareness. This will require security training for and communication between all airside parties and be driven by the airport operator.

Moving to a ‘Certified’ status and regular RPT operations thus, has major implications for the Master Plan, especially given the current physical layout of the airport and its potential impact on recreation users, skydivers, and vehicular and personnel access to the currently disjointed hangar layout.
1.4.3 Current aerodrome capacity classification

Australia has adopted the International Civil Aviation Organisation (ICAO) methodology of using a code system, known as the Aerodrome Reference Code, to specify the standards for individual aerodrome facilities which are suitable for use by aeroplanes within a range of performances and sizes. The Code is composed of two elements: element 1 is a number related to the aeroplane reference field length; and element 2 is a letter related to the aeroplane wingspan and outer main gear wheel span used to define taxiway widths.

As a general statement, the following aircraft codes are as follows:

<table>
<thead>
<tr>
<th>Field Length Code</th>
<th>Wing Span Code</th>
<th>Type of Aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>Light aircraft</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>Intermediate size</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>Larger aircraft used on regional passenger services</td>
</tr>
<tr>
<td>4</td>
<td>D,E,F</td>
<td>Aircraft used on major domestic and international routes</td>
</tr>
</tbody>
</table>

(See table below for further technical details.)

Even though both runways at Mundoo Airport are rated as Code 3 in length they are published as Code 2 (main runway) and Code 1 (cross strip) due to some constraining factors.

There are no hangars at the airport currently capable of handling Code C type aircraft.
1.4.4 Obstacle Limitation Surfaces - OLS
There is a regulatory requirement for the control of obstacles in the vicinity of airports. As part of the Master Planning process, a ground survey of obstacles was carried out. The survey found that apart from the limited need for vegetation control (tree/plantation lopping/removal), there were no major obstacles likely to cause a height problem for the airport operating aircraft up to Code 3C status, i.e. Dash 8 series aircraft (see Chart, Appendix 1a).

1.4.5 Aircraft noise
The indications are that aircraft noise implications will not impact negatively on future runway options provided any land development is subject to planning constraints in the areas immediately behind each end of the main runway (see chart, Appendix 1b).

1.4.6 Non-Directional Beacon aviation navigation Facility (NDB)
Requirements for operation of the NDB located in the Eastern Sector main runway frontage impose a significant constraint on further hangar development in that area. For unimpeded operations, Airservices Australia require the surrounding area to be clear of buildings within a 150 metre radius of the installation.

Map #4 illustrates how a number of existing hangars currently infringe this requirement. Airservices has advised that no additional structures and/or hangars can be built inside the current NDB siting criteria due to possible performance degradation and associated safety implications. This issue is discussed in further detail in Section 2.3.2.

1.4.7 Public Safety Areas (PSA)
The Queensland Government has identified Public Safety Areas relating to airports where risk of accidents occurring during take off and landing are higher than needs to be taken into account in town planning, especially in relation to the main runway.

1.4.8 Radio Requirements
It is a regulatory requirement that aircraft wishing to land and take off must use radios, must listen to broadcasts and must make a radio broadcast whenever it is reasonably necessary to avoid risk of a collision.

Radio reporting is currently used as a basis for Council charging for airport use through a service offered by a company called Avdata.

1.5 Town Planning
The site is currently subject of the planning scheme of the former Johnstone Shire.

Map #5 gives current situation. A new planning scheme is being prepared which will include a Mundoo Airport Protection Area. While proposed provisions have already been developed for the area, there is an opportunity for this report to inform the new scheme, and recommendations are included in Section 7.
Map #4 - N.D.B. Operational Zone
1.6 Land Ownership & Leases

1.6.1 Land Ownership
A feature of the airport is that it is surrounded by freehold land, mainly used for primary production.

This situation has already resulted in some private development outside the airport boundaries related to the airport, namely:

- Tandem Skydiving acquisition of a former farm house and adjoining property on the Western Sector grass strip frontage for its parachuting operation;
- Construction of a large private hangar on the Southern Sector main and grass strip intersection currently temporarily used for housing the Skydive aircraft and other small recreational aircraft.

The airport is also owned freehold by the Cassowary Coast Regional Council and this means that the Council itself could offer freehold lots from its own area.

The situation raises a major question for the Master Planning process.

Given the limited extent of land within the airport boundaries, to what extent should the Council look at meeting future needs by:

a) Encouraging, through appropriate town planning and approval procedures, land owners to develop facilities on freehold land adjacent to the airport, for airport related use, or

b) Acquiring additional land and acting as the developer.

Section 6.2 looks at this question further as part of Commercial Planning.

1.6.2 Leases
There are problems of the existing layout of hangars, especially in the NDB area, for separation of ‘landside’ access from ‘airside’ security areas.

Diagram #6 shows current expiry dates of leases if Master Planning considerations indicate a need to relocate leases. Of the 17 leases identified, 12 expire in 2015 or 2016, with the remaining in 2020. Detailed analysis of further option periods has not been carried out.
Diagram #6 – Expiry Dates of Leases

- LEASE-F (2016)
- LEASE-G (2016)
- LEASE-H (2016)
- LEASE-J (2016)
- LEASE-K (2016)

- LEASE-L (2016)
- LEASE-N (2015)
- LEASE-P (2015)

- LEASE-Q (2016)
- LEASE-R (2016)
- LEASE-S (2016)
- LEASE-T (VACANT)

- LEASE-U (VACANT)
- LEASE-V (VACANT)
- LEASE-W (VACANT)

- LEASE-E (2020)
  H:\7080008412
  SP148720
Summary Implications for Masterplan

Background

- Topography creek lines and flood hazards restricts the ability to extend the main runway to the north and to place facilities along the northern end of the main runway.

- The north south railway and roads restrict opportunities to extend the main runway to the south.

- The airport will eventually need to upgrade its current status of being a ‘registered’ airport to being a ‘certified’ airport with major implications for providing upgraded fencing and isolation of ‘airside’ secure areas with access requiring security passes.

- The airport does not have major issues relating to obstacle limitation and noise constraints, however rapid tree growth in the area needs to be regularly monitored and controlled.

- There is an opportunity for the current review of the Town Planning Scheme to be informed by the report.

- The airport has extensive frontages of privately owned freehold land with a potential opportunity for private interests to develop airport related facilities.

- There is limited Council owned land on the airstrip frontages and there are problems of layout in the existing main facilities area especially if the airport needs to move to secure airside areas.

- Lease terms are such that there would not be major problems if leases need to be shifted.
2.0 DEMAND PATTERNS

2.1 Aviation Operations

...Report, June 2011, Cassowary Coast Aerodrome Demand and Management Study by Cummings Economics, analyses potential demand for aviation operations over a 10-year time frame. The study found that the Avdata records of aircraft movements understated total movements because of failure by some operators to ‘radio in’ on landing because this triggered a charge for airport usage. The records available however indicated that, although of the order of 150 different aircraft were using the airport in a given year, two ‘constant’ operators (the Skydiving and Bob Harris Training School), were accounting for over 60% of movements, with about half a dozen ‘regular’ users accounting for a significant part of the remainder.

The following table and charts (over) shows recorded landings by ‘constant’, ‘regular’ and ‘occasional’ users and total, by years since 2006. (Note: 2006 figures were affected by Cyclone Larry.) The table indicates that more recent movements have seen overall landings recorded climb again after a post GFC low in 2010 by 13% in 2011 and a further 20% in 2012, by a total of about 1400 movements. Of this increase, the two ‘constant’ operators have contributed about 300 and the ‘regular’ group about 100. The major increase has been in the ‘occasional’ group. Analysis by weight (MTOW) indicates that landings of aircraft under 2000kg grew by 40% over the two years 2010 to 2012, and those 2000kg and over by 26%.

The Aerodrome Demand Study estimated total movements (landings x 2) in 2010 taking into account under reporting, were probably in the 7000 – 8000 range. Based on the latest information, the indications are that they are now probably in the 11,000 to 12,000 range.

Based on the 2010 figures, it was estimated that by 2020, total movements would more than double to bring of the order of 20,000 movements a year with an average annual growth of about 8% per annum. Projecting over a further 10 years is difficult however for the purpose of Master Planning, it is assumed that the growth would add a further 50% and that total movements would rise to being of the order of 15,000 landings or 30,000 movements per annum, ie. about 2½ times the current level or an average growth of about 5% per annum over the 20 years.

Break up of landings between different purposes is modeled roughly as follows.

<table>
<thead>
<tr>
<th>Modeled Annual Landings &amp; Movements, 2030</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1,000</td>
</tr>
<tr>
<td>Training</td>
<td></td>
</tr>
<tr>
<td>Fixed wing</td>
<td>2,100</td>
</tr>
<tr>
<td>Helicopter, say</td>
<td>700</td>
</tr>
<tr>
<td>Recreational</td>
<td>1,000</td>
</tr>
<tr>
<td>Parachuting</td>
<td>4,000</td>
</tr>
<tr>
<td>Tourism sightseeing</td>
<td>500</td>
</tr>
<tr>
<td>Recreational</td>
<td>2,000</td>
</tr>
<tr>
<td>RPT services</td>
<td>1,200</td>
</tr>
<tr>
<td>FIFO</td>
<td>1,200</td>
</tr>
<tr>
<td>Emergency</td>
<td>100</td>
</tr>
<tr>
<td>Other</td>
<td>1,200</td>
</tr>
<tr>
<td>Landings</td>
<td>15,000</td>
</tr>
<tr>
<td>Movements</td>
<td>30,000</td>
</tr>
</tbody>
</table>
Table & Charts - AVDATA Recorded Landings at Innisfail Aerodrome classed by operator landings pa

Constant (500+), Regular (30+), Occasional

<table>
<thead>
<tr>
<th>Year</th>
<th>Constant</th>
<th>Regular</th>
<th>Occasional</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>676</td>
<td>644</td>
<td>1655</td>
<td>2975</td>
</tr>
<tr>
<td>2007</td>
<td>718</td>
<td>706</td>
<td>2777</td>
<td>4201</td>
</tr>
<tr>
<td>2008</td>
<td>653</td>
<td>841</td>
<td>2557</td>
<td>4051</td>
</tr>
<tr>
<td>2009</td>
<td>1038</td>
<td>636</td>
<td>2512</td>
<td>4586</td>
</tr>
<tr>
<td>2010</td>
<td>1724</td>
<td>191</td>
<td>2336</td>
<td>3852</td>
</tr>
<tr>
<td>2011</td>
<td>2282</td>
<td>367</td>
<td>2254</td>
<td>4314</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td>311</td>
<td>2622</td>
<td>5215</td>
</tr>
</tbody>
</table>

Percentage Breakdown:

- **Constant**: 56% 66% 63% 60% 61% 53% 50%
- **Regular**: 22% 19% 24% 15% 5% 8% 6%
- **Occasional**: 23% 19% 16% 25% 34% 39% 44%
The major growth is envisaged as coming from recreation, training and tourism (parachuting and sightseeing).

Of special importance to the Master Plan will be the question of regular services of aircraft with 30 seats or more triggering a need for the airport to go to ‘Certified’ classification with the attendant need to have airside secure areas.

Current FIFO service needs are being met by aircraft with seats of less than 30. Major FIFO flights (eg. from Cairns), are currently using aircraft with up to 100 seats.

However given the general growth in FIFO activities, not just for mining but for a range of other activities, there seems to be strong prospects for a demand developing out of Innisfail for aircraft with more than 30 seats. Given the size of the workforce in the area, it is difficult at this point of time, to see a demand for up to 100 seat aircraft for this purpose.

There are currently no RPT or proposed RPT services. Given proximity to Cairns, it seems unlikely that any RPT services of any substantial aircraft size would develop. Where demand might prospectively come from is tourism.

Innisfail airport is the closest to the substantial tourism area at Mission Beach. The Ella Bay development is proposed to add a large amount of tourist accommodation to the stock available in the Cassowary Coast area over a period of time.

It is envisaged that one of the target markets will be Asian visitors also visiting Sydney and Brisbane/Gold Coast area. A pattern of flights direct between Brisbane/Gold Coast/Sunshine Coast and Innisfail is envisaged, then bus to Cairns to depart through Cairns International Airport.

We thus believe it is necessary to have a Master Plan that caters for eventual development of regular services by larger aircraft if and when the need arises.

### 2.2 Future Hangar Requirements

Hangars and aircraft located at Mundoo Airport are as follows:

<table>
<thead>
<tr>
<th>Hangars</th>
<th>Aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation ..................4</td>
<td>Recreational ..................16</td>
</tr>
<tr>
<td>Recreation/Business ..........1</td>
<td>Agriculture ..................5</td>
</tr>
<tr>
<td>Agricultural/Heli ops ..........5</td>
<td>Training ..................4</td>
</tr>
<tr>
<td>Training ..................1</td>
<td>Skydive ..................1</td>
</tr>
<tr>
<td>Non-Aviation Business ........1</td>
<td>Other ..................1</td>
</tr>
<tr>
<td>Other non-defined ........1</td>
<td>Other ..................1</td>
</tr>
<tr>
<td>Vacant ..................1</td>
<td>Other ..................1</td>
</tr>
<tr>
<td><strong>Total ..................17</strong></td>
<td><strong>Total ..................17</strong></td>
</tr>
</tbody>
</table>

Modeled increase in need for hangars, 10 years and 20 years, by type is as follows.
Currently the Terminal is rented to and used by R Harris for flight training. With the advent of Code 3 operations, a new or expanded terminal would need to be constructed and appropriate car parking developed.

In order to quantify the area needed for the various types of hangars, a standard layout was developed (see Appendix 2). These layouts take into account current aviation regulations and current best practice for the landside configuration.

## 2.3 Airpark Development

The Aerodrome Demand Study identified a growing demand around Australia for recreation aircraft. This has underpinned a development of Airparks where air strips were developed with lots available for construction of residential houses combined with hangars.

Three developments of interest have been identified – at Atherton Aerodrome, the Wave Development in the Whitsundays, and a development associated with Bundaberg airport.

Implications for the Master Planning of Mundoo Airport are:

- Apart from a demand for small hangars for recreation aircraft owners, there is a potential demand developing for house/hangar combinations.
- The market is still relatively small but is predicted to grow.
Summary Implications for Masterplan

Demand

There is a need to plan for an expansion of aircraft movements of the order of 2½ times the current usage.

Over a 20-year time frame major additional use in terms of aircraft movements is likely to be in recreational, tourism (parachuting and sightseeing) and training.

However over this time frame, planning needs to take into account demand for use by RPT/FIFO aircraft carrying 30 passengers or more, generating a need for certification and secure airside areas and a possible need for hangars to accommodate larger passenger aircraft.

A potential market is developing for airpark type combined house/hangar developments.

There is likely to be a demand over a 20-year time frame for a three-fold expansion in the number of hangars but with the major expansion being in recreation hangars. However planning needs to allow for hangars for larger types of aircraft used on regional routes and FIFO.
3.0 AIRPORT FACILITIES ISSUES

3.1 Issues Relating to the Main Runway

3.1.1 Pavement surface and strength
The main runway is a Code 2 sealed runway 1353m x 30m with a current published PCN 9. In late 2011 the runway, taxiway and apron had a double coat of 10mm aggregate with Polymer Modified Bitumen as part of Federal Government funding following the impact of cyclone Larry in March 2006. Discussion with the local airport operators indicate that these works were not fully completed due to a shortfall in funding resulting in loose aggregate on the runway surface causing propeller damage ‘pitting surface’ to aircraft. This problem represents a potential liability risk and needs to be attended to.

The pavement strength is currently capable of handling aircraft up to a Dash 8-300 (50 pax maximum), PCN 9 requirement. The condition and strength of the main runway pavement is critical to the potential for the airport to handle larger aircraft such as the Code 3D Dash 8-Q400 aircraft (78 pax maximum) with a PCN of 16.

It is estimated that an additional layer of 65mm could be necessary to bring the strength up to PCN 16 at a cost approximately $1.9m (2013). However this seems likely to be an upper estimate. Preliminary investigation indicates the existing PCN could be higher and up to PCN12. If this proved to be the case, cost of strengthening could be substantially less. (For technical details, see full report.)

3.1.2 Main runway length and direction
The runway length is 1353m. Investigations indicated that aside from some vegetation issues in the transition surface and isolated trees under both main runway approaches, the main runway can be upgraded to Code 3 status.

If the main runway is to attain Code 4C status to accommodate aircraft currently used on major domestic routes (A320, B737-800, B717-200 and Embraer EMB190), a 45m wide runway, minimum length 2250m, 300m wide runway-strip, non-precision instrument approach at both ends will be required. This is not feasible on the current alignment without major disruption to Bamboo Creek. The costs associated with this change would be significant, and involves impacts on the surrounding environment.

An investigation was carried out to establish what is the optimum runway length available if the primary and/or secondary runway alignment is rotated within the 110-160 degrees magnetic zone. These bearings give greater than 95% runway usability in all weather conditions (acceptable ICAO minimum requirement) for 10 knot cross wind tolerance and single runway only layout. The investigation also considered the existing landscape and limitations, ie road network, north coastal rail line, location of residences, location of Bamboo Creek and the surrounding terrain, particularly the rising ground peaks to the NNE, ESE, SSW, W and NNW.

Results indicate that within the existing landscape and physical constraints, there would be no advantage in realigning either of the existing runway directions as there would be no significant increase in runway length sufficient to enable Code 4 operations.
It should be noted that if the main runway was widened to accommodate Code 3 aircraft, the NDB would obstruct, and vegetation along Bamboo Creek along the western side of the main runway would also obstruct.

### 3.1.3 Types of aircraft

Current domestic and regional RPT aircraft used in Australia that are able to take off and land on the primary runway at Mundoo (subject to individual payload operating assessments), include the following:

**Aircraft that can operate out of Mundoo at present**

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>Code</th>
<th>PCN</th>
<th>Max Pax</th>
<th>Runway Length (ARFL)</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saab SF 340</td>
<td>3C</td>
<td>PCN 6</td>
<td>37</td>
<td>1300</td>
<td>Rex Express/Pel Air</td>
</tr>
<tr>
<td>Dash 8 100/200</td>
<td>2C</td>
<td>PCN 8</td>
<td>37</td>
<td>1000</td>
<td>Skytrans/Sunshine</td>
</tr>
<tr>
<td>Dash 8 Q300</td>
<td>2C</td>
<td>PCN 9</td>
<td>56</td>
<td>1100</td>
<td>Eastern Australia/Sunshine</td>
</tr>
<tr>
<td>Metroliner</td>
<td>3B</td>
<td>PCN 4</td>
<td>19</td>
<td>1340</td>
<td>Brindabella/Sharp/Toll</td>
</tr>
<tr>
<td>Jetstream</td>
<td>3C</td>
<td>PCN 4</td>
<td>19</td>
<td>1240</td>
<td>Brindabella/Aero Pelican</td>
</tr>
</tbody>
</table>

There are a number of current regional and domestic RPT aircraft types that are unable to operate out of Mundoo on a regular basis due to either insufficient runway length/width, or, higher than acceptable PCN.

**Aircraft that cannot operate out of Mundoo at present**

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>Operator</th>
<th>Code</th>
<th>Pax</th>
<th>PCN</th>
<th>Runway Length (ARFL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A320 – 200</td>
<td>Jetstar/Tiger</td>
<td>4C</td>
<td>150-180</td>
<td>PCN 37</td>
<td>2090</td>
</tr>
<tr>
<td>V717 – 200</td>
<td>Qantas Link/National Jet</td>
<td>4C</td>
<td>115</td>
<td>PCN 33</td>
<td>2130</td>
</tr>
<tr>
<td>Embraer 190</td>
<td>Virgin</td>
<td>4C</td>
<td>100</td>
<td>PCN 21</td>
<td>2110</td>
</tr>
<tr>
<td>Fokker 50</td>
<td>Skywest/Alliance</td>
<td>3C</td>
<td>56</td>
<td>PCN 11</td>
<td>1760</td>
</tr>
<tr>
<td>Fokker 100</td>
<td>Skywest/Alliance</td>
<td>3C</td>
<td>109</td>
<td>PCN 27</td>
<td>1820</td>
</tr>
<tr>
<td>Jetstream 41</td>
<td>Brindabella</td>
<td>3C</td>
<td>29</td>
<td>PCN 5</td>
<td>1500</td>
</tr>
<tr>
<td>Dash 8-Q400</td>
<td>Qantas Link</td>
<td>3C</td>
<td>68-80</td>
<td>PCN 16</td>
<td>1350</td>
</tr>
<tr>
<td>ATR 2-500</td>
<td>Skywest</td>
<td>3C</td>
<td>62-74</td>
<td>PCN 12</td>
<td>1340</td>
</tr>
</tbody>
</table>

Advice from Qantas Link Performance Engineer indicates that there would be some payload restrictions in operating the Q400 and Q300 out of Mundoo.

### 3.1.4 Extension of main runway

A ground survey of the potential extension of the main runway was unable to be carried out due to the terrain and current usage. However an assessment using Google-earth data has been conducted which indicates an extension of around 370m is possible without any change to the alignment of Bamboo Creek.

Runway End Safety Area (RESA) must now be provided at the end of runway strips. The previous standard to which Mundoo was constructed enabled the RESA to be between the end of the runway and the end of the runway strip.
This change will necessitate the moving of the main runway threshold and lighting at the south east end with an effective loss of approximately 50m of runway length.

Estimated cost to extend the runway to the limits imposed by Bamboo Creek is estimated at $5.4m (2013 dollars), involving fill, compaction and runway construction.

This extension will provide a Code 3C runway length of around 1670m. This could accommodate additional aircraft types such as Fokker 50 and Jetstream 41.

### 3.1.5 Taxiways

As number of aircraft movements increase, there is a possible need for a non sealed taxiway on the eastern side of the main runway for Code A aircraft and a parallel Code C taxiway for the main runway.

The Code A taxiway could be constructed at low costs by marking the grass areas. Some stabilization may be necessary to ensure year round serviceability.

If sufficient traffic eventuates, a sealed taxiway to the east of the main runway would be needed to facilitate Code C movements.

As [Map #12](#) illustrates, the extra land needed for a Code C taxiway would extend outside the current airport boundaries and would necessitate acquisition of additional land along the eastern side of the main runway of about 20 meters width. This land tends to slope off to the east and fill will be required. Estimated cost of fill to establish the taxiway is of the order of $1.9m (2013 dollars).

Because of likely heavy additional fill costs and the existence of a property and house at the northern end, the length of the Class C taxiway in the Master Plan has been restricted in length.

### 3.1.6 Aircraft range

Some key distances are Mt Isa 774km, Lae/PNG 1152km, Gove/NT 1160km, Brisbane 1316km, Alice Springs 1455km, Sydney 1892km, and Darwin 1726km.

Qantas Link has advised that the effective range for a Q-300 from Innisfail is to approximately Gladstone (1090 km). The effective range for a Q-400 is to approximately Maroochydore (1525 km). These distances are based on aircraft operating at maximum payload therefore limiting fuel carrying capacity. Increased range to Brisbane could be achieved by marginally reducing passenger payload and increasing fuel carried.

Discussions would have to be conducted with individual operators to establish the viability of longer hauls.

### 3.1.7 New generation aircraft

It would seem that the trend is toward new generation regional jets (50-100 seats) that will be compatible with existing airport infrastructure. They will fly faster and be more fuel and noise efficient, and operate generally from shorter runways for given passenger numbers. Innisfail, once the main runway has been suitably strengthened, will be well placed in the future for regional services.
3.2 Issues Relating to Secondary Grass Strip

The standards for a Code 1 runway indicate that the grass cross strip runway can be reduced from current 30m to 18m width and the runway strip to 60m wide. This would enable the land outside the 60m wide runway strip boundaries to be developed for future Code A hangars/Airpark etc.

Investigation also looked at the potential to reduce the runway length required for Code 1 operations.

Examination of aerial photos of the runway and discussion with the local operators indicated the optimum length is around 1100m. This allows for touch-and-go training operations and the parachute and ultra-light recreation aircraft to operate almost exclusively.

In discussions with the users of the airport, it was established the runway is used extensively by the skydiving/parachuting company, ultra-lights and for cross wind training by Bob Harris and other trainers. Operators also indicated that it is desirable to have an area of runway beyond a 1100m runway length for emergency use, even though this is not mandated in the regulations. This could take the form of a RESA which has less stringent requirements to a runway.

The question of possibly truncating the northern arm of the grass strip to improve connectivity between the Eastern and Northern Sectors was explored as an optional variation.

3.3 Parachuting Requirements

Discussions with the parachuting company operating on the Western Sector grass strip frontage indicates that placing hangars/buildings on the southern side of the strip opposite them would cause problems. ‘Parachutists generally float into this area of the grass strip from the south/south-east and apart from obstacles, it is believed buildings cause an updraft.

If parachuting is to remain as a function in that area, there is a requirement that no buildings are developed in that area of the grass strip.

3.4 Tarmac Apron/Terminal Requirements

On a 20-year horizon, there is a need to cater for an expansion of the Tarmac Apron, terminal and associated parking facilities.

An apron to cater for four Dash 8-Q400 sized aircraft plus expanded terminal and parking facilities would take up the whole area from the 'Motel' hangars along the grass strip to existing hangars on the southern eastern edge of the existing apron.

3.5 The NDB Area Issue

The NDB currently has a 150m radius restriction zone that when applied significantly restricts development in its locality due to potential interference.

There are already 12 existing buildings/hangars located within the 150m exclusion zone. If limitations of the NBD are accepted and a need to reserve space to allow a Tarmac Apron in the future that would cater for up to four Dash 8-Q400 series, with room for associated terminal and parking development, the current reality is that there are no lots of land available in the existing apron/NDB area that do not have the potential to comprise the NDB.
Airservices are planning to remove all surplus navigation aids from services on a charting cycle scheduled in June 2016. Airservices consider it appropriate to consider forward planning of the site when/if the NDB is to be decommissioned. It is likely that before the NDB is decommissioned revised instrument landing procedures will need to be designed to provide landings from both directions of the main runway.

The local airport flying school has indicated the NDB is a valuable pilot training navigation tool and seeks its retention while NDBs are in use. The NDB is old technology that is being replaced by Global Positioning Satellite based systems. The NDB removal by 2016 has not been confirmed. The Master Plan assumes the land surrounding the NDB site is not available for immediate development.

Maintenance of the NDB represents an ongoing cost with Council records indicating at least $12,000 spent on repainting and maintaining the NDB facility in 2012.

There are further complications for future layout in the NDB area if the airport goes to ‘Certified’ status and security controls have to be implemented. Five of the hangars within the NDB exclusion zone have no landside access.

There is also a strong possibility that a number of these hangars do not meet the necessary clearances for aircraft operations. Unfortunately it is not possible to verify this as there are no markings or markers in accordance with regulatory requirements.

3.6 Recreation/Airpark Development

As identified in Section 1.6 Demand Patterns, there would seem to be a market now, and possibly increasingly in the future, for an airport recreation hangar and house/hangar developments. The type of development can occur along the grass strip and especially for house/hangar development. “Ambience” is important.

Some four areas have been identified where this type of development could occur. However in all, some cost of road access would need to be met (see Map #7). Details of what might happen in the different areas is discussed in the next section.

Recreation Hangars/Airpark can be placed parallel to the grass strip (RWY 03/21) at the south (Area A) and north eastern (Area B) ends.

With Area A, a length of 250 m will have to be reserved for the drop zone of the parachutes. Access can be from Cardier Road.

Area B can be accessed from Aerodrome Road with a new road being constructed parallel to the grass strip (RWY 03/21).

An area of private land south west of the main strip (RWY 14/32) (Area C) could be reserved for additional Recreation Hangars/Airpark. Access can be from Mundoo or via Cardier Road.

The Council owns a small parcel of land at the intersection of the two runways (Area D). At present, Area D does not have road access, but discussions with the parachute company indicated it would be amenable to sharing the cost of a road on the northern boundary of their property in order to gain access to Area D. There is an area of private land fronting the main strip in this area that would also be suitable.
The approximate numbers of Recreation Hangars/Airpark lots that could be developed in the four areas are:

- Area A: 20 lots
- Area B: 23 lots
- Area C: 25 lots
- Area D: 30 lots

**Total: 98 lots**

This is many times the likely demand over a 20-year period.

**Map #7 – Possible Areas for Recreational Hangar/Airpark Hangar/Home Developments**
3.7 Other Uses

**Training**
It is envisaged that training rooms would be located with terminal facilities and aircraft in Business Code A areas.

**Fuel**
There are currently two fuel points:

- In the vicinity of the main apron/terminal;
- At the parachuting centre.

It is envisaged that the main fuel point will remain in the main apron/terminal area.

However it is envisaged that a fuel point could develop in the Southern Sector in the future.

**Recreation club facilities**
At present the Aeroclub has facilities in the apron/terminal area and the parachuting has facilities. It is envisaged that recreation/club facilities would continue to develop in these areas but might also develop in the Southern Sector in the future.

**Airfreight**
It is envisaged that this type of facility would locate in areas where hangars for larger aircraft were likely to be established or in any areas designated for industrial purposes.
Summary Implications for Masterplan

Facilities Issues

Main runway direction is at optimum, but topographical and other factors mean that maximum length that might be achieved on the site is about 1670 meters which would be sufficient length for aircraft in the 80 – 100 seat range typically used for regional RPT services and major mine FIFO operations. However type of passenger jets used on major domestic services that would require a runway length of about 2000 meters could not be accommodated at the site without very major expense and diversion of Bamboo Creek.

There are some immediate needs to deal with problems of loose stone material on the runway.

The main runway would need to be strengthened to take the larger regional service aircraft (eg. Dash 8-Q400).

A need for substantial fill would make cost to extend and strengthen the main runway an estimated $5.4m in current prices.

A parallel taxiway for the larger aircraft used on regional services would require fill and cost of the order of $1.9m.

The timing of need for extension of main runway, strengthening and taxiways is uncertain and it is envisaged would only be undertaken if demand develops. However land needs to be protected to enable these developments to occur in the future.

The size of aircraft using the grass cross strip do not need the full length of the strip however due to parachutists using part of it and requirements for training, truncating it to a shorter length is not included as a main option.

Provision needs to be allowed for eventual expansion of the existing apron area in the event of RPT/FIFO services developing using larger regional aircraft, along with space for associated terminal, office, car parking and flight training school.

There is a major issue of the constraints the Non Directional Beacon (NDB) places on the expansion of hangars in the current general aviation hangar area as opposed to its current usefulness for aviation training. However it is old technology and likely to be decommissioned at some time in the future. The Masterplan needs to provide for removal of the NDB at some time in the future releasing land for additional hangar development in that area.

The Masterplan needs to allow for a future layout in the NDB area that accommodates future needs for airside security if/when RPT or FIFO services develop using aircraft of more than 30 seats.

There is a need to restrict building adjacent to the southern end of the grass strip to avoid interference with parachute usage.

There are ample opportunities to cater for expanded recreational aircraft hangars and airpark hangar/house developments along the grass strip frontages and the western side of the main strip but access to most of the areas would need to be improved.
4.0 **Assessment of Areas for Further Development**

4.1 **General**

The following section looks at the suitability of the four sectors (Eastern, Northern, Southern and Western) to meet future needs.

4.2 **Developing the Eastern Sector**

4.2.1 **General**

This sector has two areas:

- A southern area that includes Mundoo village and the existing main facilities area.
- A northern area being mainly cane land.

4.2.2 **Eastern Sector southern area**

The southern area has enough unused space around the existing tarmac/apron to progressively expand the tarmac/apron as justified to accommodate up to four larger aircraft used on regional routes and for FIFO.

There is a real question about the timing and degree to which RPT/FIFO Code C aircraft traffic is likely to develop. In Masterplan Option 1, a phased approach is considered of allowing an area for two Dash 8-Q400 initially in the existing apron area, to be later extended to the south to cater for four, should demand develop. However this would involve the relocation of some older hangars.

There is enough room adjacent to the existing tarmac/apron for prospective progressive terminal development, offices, flying school development and associated parking. However if Option 1 is adopted involving location of some light aircraft hangars near the grass strip, the area available for this purpose becomes more constrained.

As set out in previous Section 3.5, while the NBN remains in the area, scope for additional hangars is limited. When the NDB is decommissioned, room will become available for a number of additional light aircraft hangars. However there is not enough space in this area for hangars for larger aircraft.

While this area is suited to continue as the key focal point for the airport, if areas are to be retained for tarmac/apron development and the NDB remains, there is little room to meet any additional demand for hangars.

Demand for recreation type hangars can be met elsewhere and eventual possible demand for hangars for larger aircraft will need to be met elsewhere.

4.2.3 **Eastern Sector northern area**

The northern area is a triangle that is currently cane land owned by Bundaberg Sugar. The land is flood free and bounded by the grass strip, the main north coast rail and the houses of Mundoo village along Aerodrome Road.

The Council owns a strip of land along the grass strip frontage that was an old ‘Dog Track’ that is under cane.
There is currently no road access into the area. There is no gap in the houses along Aerodrome Road to provide access. Access would need to come either from the ‘Motel’ area along the side of the grass strip or by building a new road in from Douglas Road across the railway line.

While potentially the Council’s owned ‘Dog Track’ area could be developed for recreation hangars, the ‘ambience’ is affected by Mundoo village and the railway line.

The fact that the area is the first significant flood free area long the railway line south of Innisfail suggests that its best use may relate to industry and as a transport interface with the airport.

Earlier studies have identified that in the area to the south of Innisfail, there is a conjunction of transport routes - the Bruce Highway, the B-double route from the Tablelands via the Palmerston Highway and Henderson Drive, the main north coast railway line, Mourilyan Harbour seaport and the airport. Included in earlier studies have been observations on the existing constraints of the rail freight yards in Innisfail and a possible need to relocate activity associated with them.

### 4.3 Developing the Northern Sector

While the Council has a substantial area (5.18ha) of former dump land in this Northern Sector and there is limited housing development in that area, developing this area for expansion of facilities has a number of problems.

1) The dump site includes significant areas in which scrap iron objects such as car bodies have been placed and areas of broken glass. Based on local information to hand, it has been assumed that there is no industrial or chemical pollution in the area and remediation costs are estimated to be of the order of $0.9m. Future investigations would need to include testing the dump site for any industrial or chemical contaminants.

2) The ideal location for development for Code C hangars and other purposes in this area would be along the main runway frontage. As indicated in the consideration of taxiways (Section 2.1), construction of a Class C taxiway along this frontage would require a strip of currently private land being acquired of a width of approximately 20 metres. As identified in Section 1.3.1 on topography, there would only be a very limited area fronting the main runway that might be available without substantial fill being required.

3) Development of hangars along the grass strip frontage would be on relatively flat land but for larger Code C hangars access would need to be via a sealed taxiway. This means that the area immediately adjacent to the main runway needs to be quarantined for Code C development and demand for hangars for Code A aircraft would need to be pushed east.

4) It would be possible to develop the dump site (if remediated), for Code A hangars. Map #8 gives suggestion by the Airport Users Group. This is not as operationally efficient as extension of a line of hangars along the grass strip. However extending along the grass strip would move development into private land that would need to be either acquired or zoned. This would involve an area of approximately 5ha. Acquisition cost is estimated at about $0.05m.

5) The other major problem is access. Current access is via Douglas Road which is unsealed and of low grade.
This is not a very efficient route to access the area from the terminal and current main general aviation area in the Eastern Sector. Section 5.2.5 canvasses an option to truncate the north-eastern end of the grass strip. The line of houses along Aerodrome Road restricts direct access from it into the northern end of the grass strip. The other alternative would be to provide a direct access from Douglas Road crossing the railway line into the northern end of the grass strip to service any development in Area B ‘Dog Track’ area but also to pass around the end of the grass strip to provide more direct access to the Northern Sector dump area. Map #9 illustrates.

4.4 Developing the Southern Sector

The main runway frontage in the Southern Sector (identified as Area C), is an obvious potential area for development. The land is flood free and hangars could be accessed either direct from Mundoo Road or via Cardier Road. There is already a private larger hangar development in the area that is compatible with this usage.

Either Code A or Code C hangars could be developed along the main strip frontage. Diagram #10 illustrates for Code C aircraft hangars.

The indications are that an area of approximately 4ha of the total property of 6.384ha would need to be acquired if Council was to be the developer at an estimated cost of the order of $40,000 plus. There are houses along Cardier Road but they are well removed. However developing Code C hangars in this area could affect the ambience of the general area for Airpark development.

As canvassed in previous Section 3.6, the land along the frontage with the grass strip has obvious suitability for development for recreation hangars and airpark house/hangars (excluding about 150 meters at the western end that needs to be held free of development for parachuting operations’ safety). This development could be through private development by owners of the adjacent freehold land. However the width of the grass strip is such that Council could develop a strip of lots for recreation hangars on this land without affecting airport operations. Access could be from Cardier Road.

4.5 Developing the Western Sector

The Western Sector grass strip frontage is already partly used by the parachuting operation who are proposing to use part of their land for their own hangar development.

Council owns a strip along the grass strip frontage near the intersection with the main strip. As canvassed in Section 3.6, this area has excellent ‘ambience’ and could be developed for lots for airpark house/hangars with road access in from Wilson Road. The land fronting the main strip is subdivided into a number of private properties with houses along Wilson Road. The land fronting the main strip is suitable for private hangar development.

While commercial hangars up to those for larger aircraft could be developed along the main strip in this area, access is not as efficient as access to suitable areas along the main strip in the Southern Sector and the ‘ambience’ of the area suggests that use for recreation and airpark type house/hangar would be more suitable.
Map #8 - Possible Layout of Hangars on the Dump Site
Map #9 – Alternative Road Access to Northern Sector and of Eastern Sector (Dog Track Area)
Diagram #10 - Class C Hangar Development Area C
Southern Section Main Runway Frontage

- 28° MAG STRIP
- Code B TWY 10.5m wide
- RWS 960 x 60
- RWY 900 x 18
- CODE B hangars 20m x 17m
- 5m wide access road
- CARDIER ROAD
- 10m wide access road
- 10m wide car parking
- Code C hangars 30m x 34m
- Apron licensed areas
- Code C TWY 78m wide
- 150m RWY STRIP
- 1358 x 30
- 150m RWY STRIP
- 150m wide NDB exclusion zone
Summary Implications for Masterplan

Assessment of Areas

- The Eastern Sector can continue its role and be progressively developed as the main tarmac/apron, terminal, office, flying school and parking area.

- There is not sufficient space in the area to develop hangars for larger aircraft if and when needed in the future and land will need to be reserved elsewhere for this purpose.

- The NDB remains a valuable training asset but it is old technology and will eventually be removed. Until this happens, there is very limited opportunity to meet any demand for new hangars and there will be a need to look elsewhere for land for recreation and other light aircraft hangars.

- The triangle area currently under cane adjacent to the northern end of the grass strip would need access roads to develop. While it could be used for recreation aircraft hangars, its flood free status and location on the north south railway suggests that it might be better reserved for industrial/freight/transport interface purposes and should be protected for this purpose.

- The Northern Sector has substantial access problems, topographical problems for hangars along much of the main strip, and potential dump remediation costs along the grass strip. An area could be developed along the grass strip frontage for commercial hangars for larger aircraft and smaller aircraft at some time well into the future.

- The Southern Sector has good road access and a privately owned area of land along the main strip that could be developed for hangars for larger aircraft and smaller commercial aircraft. Along the grass strip is an area that could be developed for recreation aircraft hangars on either Council or private land.

- The Western Sector along the grass strip is already used for the parachute operations. There is an area along the grass strip that could be developed with road access for recreation/airpark type development and private lots fronting the main strip that would be suitable for this type of development.
5.0 MASTER PLANNING OPTIONS

5.1 Principles

3.1.1 Separation recreational/commercial aviation operations
The advent of RPT/Regular FIFO charters by larger aircraft and the need for the airport to become certified, with the consequent need for ‘airside’ ‘secure’ areas as opposed to ‘landside’ areas, means that there is real value in seeking to separate recreation type activities from commercial.

At the same time, it is recognized that the immediate growth opportunities for the airport is likely to be in the growth of recreation type activities including possible ‘Airpark’ type mixed residential/hangar development.

Ambience is important for this type of development and this also suggests that ‘separation’ of recreation from commercial operations would be desirable.

5.2 All Options Variations

5.2.1 General
It needs to be recognized that there are two major developments that will be triggered by external factors and be part of all options:

a) Extension of the length of the main runway to maximum length if demand develops;

b) The decommissioning of the NDB freeing up space for development in the Eastern Sector.

In addition, there is a possibility of improving road links between the Eastern and Northern Sectors.

5.2.2 Immediate works
There are also some works that need to be carried out regardless of what option is developed.

1) Fencing to exclude wallabies;

2) Improving the main existing runway to remove flying stone hazard.

There would also be a small expense in marking taxi lanes in the existing hangar area.

Works to exclude wallabies is estimated to cost of the order of $0.320m. However it should be borne in mind that if the airport goes to being a certified ‘secure’ airport, a new class of 2.4 metre high security fencing will need to be erected at an estimated cost of $1.34m.

To improve the main runway to overcome the ‘flying stone’ problem, initial works can be carried out using Council rollers to secure as much loose stone as possible and then sweep to remove remaining loose stone. Before going to the expense of replenishing bitumen however, consideration should be given to the need to eventually take runway strength to PCN16 and that it may be more economical in the long run to overcome the problem at the same time as achieving an upgrade to PCN16.
5.2.3 Main runway, taxiway and apron extension

Map, Appendix 3, shows main runway extension, Code C parallel taxiway, and apron development to accommodate up to four Dash 8-Q400 series. Accompanying development of the main runway will be a need to provide security fencing. Estimated costs are as follows:

1. Strengthening existing runway to PCN 16 ...............$1.868 m
2. Lengthening
   - Fill and works ........................................$5.397 m
   - Lighting ..................................................$0.200 m
   - Land acquisition .....................................$0.360 m
3. Code C Taxiway
   - Landfill and paving ...................................$1.886 m
   - Lighting ..................................................$0.100 m
   - Land acquisition .....................................$0.010 m
4. Apron development
   - Existing area upgrade .................................$0.641 m
   - Additional area .......................................$0.980 m
5. Security fencing
   - Perimeter 6.7km .......................................$1.340 m
6. Other
   - Tree removal allowance ..............................$0.080 m

Total ..........................................................$13.832 m

5.2.4 Removal of NDB

Map, Appendix 4, shows a plan of layout of additional hangars with the removal of the NDB assuming no future intrusions of the apron into this area (see following option). It indicates room for up to eight best practice additional Business Code A hangars and a number of less than best practice smaller hangars. It also suggests layout of ‘landside’ access and ‘airside’ aprons and taxiways’ should the need for ‘secure’ airside areas develop. Estimated cost to configure the area is as follows.

**Estimated Costs of Layout with Removal of the NDB**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads and services</td>
<td>$0.275 m</td>
</tr>
<tr>
<td>Building pads</td>
<td>$0.519 m</td>
</tr>
<tr>
<td>Graded taxiways</td>
<td>$0.222 m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1.016 m</strong></td>
</tr>
</tbody>
</table>

Offsetting this however would be a potential substantial increase in revenue (see Section 6.6.2). Cost of removal of the NDB would be minor. It is likely the below-ground wire network could remain. Cost to take down tower and associated wiring is estimated at $15,000. However Airservices Australia own the facility and costs of removal should be their responsibility.

5.2.5 Grass cross strip truncation option

Linking commercial hangars and facilities in the Eastern Sector with hangars and developments in the Northern Sector involves circuitous road access. Aviation advice is that approximately 1000-1100 meter length of grass strip should be sufficient for aircraft operations. An option would be to truncate the grass cross strip at that point and pass a connecting road across the strip. It is envisaged that the area of the remaining strip could become a RESA and be kept clear of buildings.

It would be possible to have recreation hangars along the eastern side of the strip with a controlled taxiway crossing the access road. Map Appendix 5, illustrates. A minor cost would be involved for some surface grading and relocating surface markers and RESA areas estimated at approximately $200,000. This would result in substantial savings in road works to access the Northern Sector.
5.3 Main Options - General

As requested by Cassowary Coast Regional Council, the following options are presented for possible development.

**Option 1. Recreation Dominant**
caters for some growth in usage by larger aircraft over time that looks to maximize the opportunity presented by the grass cross strip for development for recreation aircraft usage and the Airpark concept. This option keeps future development (except for a small area adjacent to the dump site) within land already owned by CCRC

**Option 2. Stronger Growth Larger Aircraft**
allows for strong growth of use by larger aircraft and general aviation hangar demand and possible use of private land in the Southern Sector.

**Option 3. Transport Hub**
envisages a separation of use with recreation usage on the south-western side of the main runway and commercial usage on the north-eastern side, including a transport hub/industrial land development on currently private land.

All options envisage a lengthening of the main runway if demand develops. The NDB is left in place but allowance is made for the eventual removal of the NDB. All options include a parachute drop zone at the south-western end of the grass strip.

5.4 Option 1 – Recreation Dominant

5.4.1 General
Map #11 illustrates Plans, Appendix 6 gives further detail.

5.4.2 Recreation/Airpark
This option envisages a maximization of opportunities for recreation hangars or Airpark hangar/house lots within the airport boundaries along the grass strip frontages of the Western and Southern Sectors and the Eastern Sector. Privately owned area along the main runway in the Southern Sector might also develop for this usage but is not included.

5.4.3 Commercial areas
This option envisages need for apron and terminal development to be limited to a capacity to park two Dash 8-Q400 series aircraft at a time.

Availability of recreation type lots will reduce demand for lots in the existing area constrained by the NDB. It envisages the NDB will remain for a substantial amount of time and envisages demand for Business Code A lots will be met by providing an area in the vicinity of the 'Motel' that could accommodate an expansion of nine Code A hangars. This area would not be large enough for Code C aircraft hangars.

If unexpected further demand develops for Code C aircraft, it envisages an expansion of the apron area through the relocation of the adjacent small hangars to elsewhere at the end of their lease terms.

The option provides for an eventual development of the Northern Sector which could include meeting any development of demand for Code C aircraft hangars. This would require upgrading and extension of Douglas Road.
Map #11 - Option 1 Diagramatic
5.4.4 Land acquisition
A small acquisition of land in the Northern Sector is estimated to cost $0.050m.

5.4.5 Phasing

Phase 1
- Allow allocation of Class A commercial hangar lots in area north of the main apron (extended Motel area).
- Place recreation/Airpark areas A, B & D (see Map #8) for expressions of interest and if demand exists, carry out road works.

Phase 2
- Upgrade and extend Douglas Road into northern segment (or truncate the grass strip) and make aircraft Code A and C lots available.

Contingent
- Strengthen runway if demand to take Dash 8–Q400.
- Lengthen runway if demand exists.
- Open out additional Code A blocks if NDB removed.

5.4.6 Estimated costs

<table>
<thead>
<tr>
<th>Estimated Cost of Development</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td>$0.740 m</td>
</tr>
<tr>
<td>▪ Upgrade of Douglas, Mundoo, Cardier &amp; Wilson Roads</td>
<td></td>
</tr>
<tr>
<td><strong>Western &amp; Southern Sectors Rec Code A Areas A&amp;D</strong></td>
<td>$1.230 m</td>
</tr>
<tr>
<td>▪ Road &amp; services to building development areas</td>
<td>$0.720 m</td>
</tr>
<tr>
<td>▪ Allowance to prepare building foundation pads</td>
<td>$0.510 m</td>
</tr>
<tr>
<td><strong>Eastern Sector Rec Code A Area B (Dog Track)</strong></td>
<td>$1.795 m</td>
</tr>
<tr>
<td>▪ Roads &amp; services to building development areas</td>
<td>$0.786 m</td>
</tr>
<tr>
<td>▪ Allowance to prepare building foundation pads</td>
<td>$1.015 m</td>
</tr>
<tr>
<td><strong>Eastern Sector Bus Code A Area (Motel)</strong></td>
<td>$0.543 m</td>
</tr>
<tr>
<td>▪ Roads &amp; services</td>
<td>$0.180 m</td>
</tr>
<tr>
<td>▪ Allowance to prepare building foundation pads</td>
<td>$0.363 m</td>
</tr>
<tr>
<td><strong>Eastern Sector Apron</strong></td>
<td>$0.641 m</td>
</tr>
<tr>
<td>▪ Apron size 2 Dash 8-Q400</td>
<td></td>
</tr>
<tr>
<td><strong>Northern Sector Business Code C (dump area)</strong></td>
<td>$2.524 m</td>
</tr>
<tr>
<td>▪ Roads &amp; services to building development areas</td>
<td>$0.636 m</td>
</tr>
<tr>
<td>▪ Allowance to prepare building foundation pads</td>
<td>$0.549 m</td>
</tr>
<tr>
<td>▪ Dump remediation</td>
<td>$0.900 m</td>
</tr>
<tr>
<td>▪ Paved taxiway for Code C</td>
<td>$0.389 m</td>
</tr>
<tr>
<td>▪ Land acquisition</td>
<td>$0.050 m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$7.473 m</td>
</tr>
</tbody>
</table>
5.5 Option 2 – Stronger Growth Larger Aircraft

5.5.1 General
Map #12 illustrates Plans. Appendix 6 gives further detail. It envisages a stronger demand for larger RPT/FIFO aircraft.

5.5.2 Recreation
This is the same as Option 1 for areas A, B & D.

5.5.3 Commercial
This provides for the whole area in the existing apron terminal ‘Motel’ area to be held to accommodate an apron up to four Dash 8–Q400 series at a time, plus expanded terminal and parking facilities and possible long term shift of the Motel hangars to the recreation hangar areas. As a consequence, unless the NDB goes, there is no availability for expansion of category A aircraft hangars. Demand is met by acquiring (or encouraging development by appropriate zoning), the strip of land adjacent to the main runway in the Southern Sector and making the area available for Code A and Code C aircraft hangars. Previous Diagram #10 illustrates how Code C hangars might be fitted along this frontage.

This option provides for eventual opening up, if needed, of areas in the Northern Sector with access via Douglas Road.

5.5.4 Land Acquisition or Zoning
This option would require land acquisition or zoning encouragement for private development, in the Southern Sector, of about 4ha and the Northern Sector about 5ha.

5.5.5 Phasing
Phase 1
- Open up recreation/Airpark Areas A and D (Southern and Western Sectors) (see Map #8).
- Acquire/encourage by zoning, the opening up of the Area C (Southern Sector main runway frontage) to provide additional commercial Class A hangars with provision for Class C if required in the future.

Phase 2
- Open up as demand justifies recreation/Airpark Area B (Dog Track).

Phase 3
- Open out Northern Sector with either upgrade or extension of Douglas Road (or truncation of grass strip).
5.5.6 Estimated Costs

<table>
<thead>
<tr>
<th>Estimated Cost of Development</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td>$0.740 m</td>
</tr>
<tr>
<td>Upgrade of Douglas, Mundoo, Cardier &amp; Wilson Roads</td>
<td></td>
</tr>
<tr>
<td><strong>Western &amp; Southern Sectors Rec Code A Areas A&amp;D</strong></td>
<td>$1.230 m</td>
</tr>
<tr>
<td>Road &amp; services to building development areas</td>
<td>$0.720 m</td>
</tr>
<tr>
<td>Allowance to prepare building foundation pads</td>
<td>$0.510 m</td>
</tr>
<tr>
<td><strong>Eastern Sector Rec Code A Area B (Dog Track)</strong></td>
<td>$1.795 m</td>
</tr>
<tr>
<td>Roads &amp; services to building development areas</td>
<td>$0.786 m</td>
</tr>
<tr>
<td>Allowance to prepare building foundation pads</td>
<td>$1.015 m</td>
</tr>
<tr>
<td><strong>Eastern Sector Apron</strong></td>
<td>$0.621 m</td>
</tr>
<tr>
<td>Apron size 2 Dash 8-Q400</td>
<td></td>
</tr>
<tr>
<td><strong>Southern Sector Business Code A&amp;C (Area C)</strong></td>
<td>$1.594 m</td>
</tr>
<tr>
<td>Roads &amp; services to building development areas</td>
<td>$0.540 m</td>
</tr>
<tr>
<td>Allowance to prepare building foundation pads</td>
<td>$1.014 m</td>
</tr>
<tr>
<td>Land acquisition</td>
<td>$0.040 m *</td>
</tr>
<tr>
<td><strong>Northern Sector Business Code C (dump area)</strong></td>
<td>$2.524 m</td>
</tr>
<tr>
<td>Roads &amp; services to building development areas</td>
<td>$0.636 m</td>
</tr>
<tr>
<td>Allowance to prepare building foundation pads</td>
<td>$0.549 m</td>
</tr>
<tr>
<td>Dump remediation</td>
<td>$0.900 m</td>
</tr>
<tr>
<td>Paved taxiway for Code C</td>
<td>$0.389 m</td>
</tr>
<tr>
<td>Land acquisition</td>
<td>$0.050 m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$8.504 m</td>
</tr>
</tbody>
</table>

(* If carried out by Council,*)
Map #12 - Option 2 Diagramatic
5.6 Option 3 – Transport Hub

5.6.1 General
Map #13 illustrates Plans. Appendix 6 gives further detail.

5.6.2 Recreational
This option provides for all recreational to be separated and on the southern and western side of the main runway along with the parachuting.

It is envisaged that areas A & D (see Map #8) could all be developed for recreation purposes including for possible recreation club facilities.

5.6.3 Commercial
It provides for all the commercial activity to be on the north-eastern side of the main runway.

It provides for up to four Dash 8-Q400 series at one time in the existing area of the apron with terminal and parking areas. This includes the ‘Motel’ area that it is envisaged would be encouraged when appropriate in due course, to shift into the recreational area.

It envisages that additional demand for commercial Class A aircraft hangars could be accommodated along the grass strip eastern frontage (Dog Track) area and that the Northern Sector would be opened up earlier than the other options with a new road coming off Douglas Road crossing the railway line to the northern end of the grass strip with roads extending along each side of the grass strip:

Option 3 raises the possibility of the land between the grass strip and the railway becoming a commercial transport/freight/industrial hub with a range of activities possible in the field of warehousing, repair and light industry not requiring a frontage onto the airport strips themselves.

A buffer area between such a zone and the houses along Aerodrome Road could be allowed for.

5.6.4 Road access
It is envisaged that road access to the transport hub area and the Northern Sector would branch off the route from Wangan via Cardier Rd, Mundoo Rd and Aerodrome Rd back to the Innisfail South Johnstone Rd and be capable of taking B-double size vehicles.
Map #13 - Option 3 Diagramatic
5.6.5 Phasing

Phase 1
- Open up recreation/Airpark areas A & D.
- Open up Area B (Dog Track) for Business Class A commercial hangars.

Phase 2
- Construct direct road from Douglas Road into Northern Sector and open up Class A lots (with reservation for Class C lots), and
- Acquire or encourage by zoning transport/industrial hub land for development.

5.6.6 Estimated costs

<table>
<thead>
<tr>
<th>Estimated Cost of Full Development Excluding Contingent (extending main strip and NDB removal)</th>
<th>$0.500 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td></td>
</tr>
<tr>
<td>Upgrade of Cardier &amp; Wilson Roads</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Western &amp; Southern Sectors Rec Code A Areas A&amp;D</th>
<th>$1.230 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road &amp; services to building development areas</td>
<td>$0.720 m</td>
</tr>
<tr>
<td>Allowance to prepare building foundation pads</td>
<td>$0.510 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Southern Sector Rec Code A (Area C)</th>
<th>$1.277 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads &amp; services to building development areas</td>
<td>$0.540 m</td>
</tr>
<tr>
<td>Allowance to prepare building foundation pads</td>
<td>$0.737 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Eastern Sector Apron</th>
<th>$1.621 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Sector Business Code A&amp;C (Dog Track)</td>
<td>$6.109 m</td>
</tr>
<tr>
<td>Roads &amp; services to buildings in eastern and northern areas</td>
<td>$2.686 m</td>
</tr>
<tr>
<td>Allowance to prepare building foundation pads</td>
<td>$2.613 m</td>
</tr>
<tr>
<td>Paved taxiway for Code C</td>
<td>$0.810 m</td>
</tr>
</tbody>
</table>

| Northern Sector Business Code C (dump area) (Note roads & services above) | $1.888 m |
|   Allowance to prepare building foundation pads | $0.549 m |
|   Paved taxiway for Code C | $0.389 m |
|   Dump remediation | $0.900 m |
|   Land acquisition | $0.050 m |

| Total | $12.625 m |

While this option involves heavy expenditure in the Eastern and Northern Sectors, it opens up a large number of Code C, Business Code A and industrial lots with potential offsetting income in the future.
6.0 COMMERCIAL PLANNING

6.1 Current Revenue & Expenditure

Analysis of financial information provided by Council for Mundoo Airport indicates that the airport is generating revenue of about $70,000 a year from leases and in recent years ‘user charge’ income has increased to about $30,000, ie. about $100,000 in total.

Avdata charges a 15% fee for collection of user charges, ie. about $4500.

Council records indicate payments to external sources for services and allocation of Council plant and stores expenses are running at about $30,000 a year. (In 2012/13 there has been an extra ordinary cost for outside services (including at least $12,000 on the NDB), that will push this up to over $53,000.) Allocation of staff payroll is about $40,000 a year. In addition, depreciation is being allocated at a rate of about $130,000 a year.

Thus, the indications are that the airport has been operating recently to cover costs of outlays and cover payroll costs allocated to it. Depending on expenses for a given year, it seems to be making either a minor contribution to depreciation or not at all. We thus have a situation where the airport is generally meeting operating costs but not covering capital costs. To meet full depreciation costs, it would need to more than double current revenue.

6.2 Development Entity

6.2.1 General

The following looks at two approaches:

a) The Council develops its existing land and acquires land for airport development;

b) Land is zoned and private land owners encouraged to meet development needs.

6.2.2 Council acts as the developer

Land within the current boundaries allows for Council to be the ‘developer’ with some expenditure on road access and services, for the following:

Recreation/Airpark

Area A (Southern Sector - grass strip frontage).
Area D (Western Sector - grass strip frontage).

Recreation or Commercial Hangars

Area B (Eastern Sector - grass strip frontage).

Commercial

Dump area in the Northern Sector.

Areas fronting onto the airport considered in the foregoing, but owned by other parties, are as follows.
Recreation or Commercial
Area C (Southern Sector – main runway frontage).

Recreational
Area A (Southern Sector – grass strip frontage (alternative).
Area D (Western Sector – private blocks along main strip frontage.

Commercial
Northern Sector - lands outside of the dump area.
Eastern Sector - potential transport hub industrial area.

Main Runway Lengthening and Parallel Taxiways (Code C)
Northern Sector – along main strip.

Local inquiries indicate that cost of farming land in the area has risen and stands at about $10,000 per ha, 2013 values.

For the main runway lengthening, there would be no option but to acquire land. The question is whether to acquire a minimal amount or acquire a larger area and lease back for farming. The same applies to acquiring other land around the airport.

Cost to acquire minimum areas of all important land to extend main runway, for a parallel taxiway and on frontages, is estimated at approximately $250,000 plus house and shed, say $300,000, total $550,000. Maximum land acquisition would involve 59ha at a cost of about $600,000 plus house and shed, say $300,000, total $900,000.

Of these areas, only the strip extension and parallel taxiway would be absolutely necessary at some time in the future with a current estimated minimum land cost of 8ha $80,000 plus house and sheds, say $300,000, total $380,000.

6.2.3 Council works in partnership with private land owners
The land for expansion of the runway and for taxiways would need to be reserved and eventually purchased.

Northern Sector – low priority for development because of landfill and access problems

Eastern Sector – northern end land near railway – protect and consider development proposals including for industrial freight hub purposes.

Eastern Sector – southern end land - Council hold for progressive development for tarmac/terminal/parking area. Consider proposals for hangar development but seek to reserve for commercial purposes and encourage recreation users into Western and Southern Sectors.

Southern Sector – protect strip frontages for airport development. Work with private interests to develop the main strip frontage for commercial hangar purposes including eventually for larger aircraft. Protect grass strip frontage for development on private land or on Council airport land.

Western Sector – reserve areas along grass and main strip for airport development and work with private interests to develop Council land and other privately owned land for recreation/airpark purposes.

Any development on private land will require a development application accompanied by a proposed development plan for the area. Conditions would need to be negotiated with Council for aircraft to access the airstrip (see Recommendation, Section 6.4.5).
6.3 Leases

6.3.1 Lease periods
The Master Planning process has identified some leases as possibly needing to be acquired or shifted over time in certain circumstances. Previous Map #7 illustrates.

Apart from one lease, there would seem to be an opportunity to acquire or shift leases about 2015/16. However it is unlikely that demand would have developed by then for larger aircraft movements to trigger a need to do this.

It is recommended that leases in the NDB area be kept short to 5 years until the future of the NDB becomes clearer and the likely need for any future expansion of the apron into this area. Otherwise leases in new areas could be made longer to 20-year periods.

6.3.2 Rents and conditions
Usual condition is that the lessees are responsible for costs of building construction and maintenance and Council charges. Most are inclusive of rates but some more recent ones have rates additional. The lease rentals are generally set at a rate at time of the lease plus CPI. Current rentals are about $4.50 per m² including rates.

Enquiries indicate that equivalent rentals at Mareeba are about $3.75 m² and Atherton $2.90 m². However for Atherton and Mareeba Council, rates, water rates and State fire levy are additional, and one-off establishment costs for headworks include:

- $4250 for site works.
- $4800 for electricity connection.
- $778 for existing infrastructure construction.

There would appear to be an opportunity to raise lease rentals but only marginally by making Council rates, water rates and State fire levy additional.

6.3.3 To lease or freehold
There have been expressions of interest by some lessees in being able to freehold. It is understood that this could only happen if there is public road access to the property. This currently restricts the opportunity to a limited number of leases along Mundoo Road. Clearly terms and conditions would need to be negotiated but as a rule of thumb, it could be expected that a free-holding price would need to be ten times the current lease rental plus costs. Purchase price for a long term lease is estimated at nine times lease rental.

Value of leases fronting Mundoo Road at a lease rental yielding $4.50 m² for free-holding, could be expected to provide a sale revenue of $45.00 a m² freehold or about $40 for long term lease.

<table>
<thead>
<tr>
<th>Potential Capital from Freehold or Long Term Lease</th>
<th>Sq m</th>
<th>Freehold</th>
<th>Long term lease</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mundoo Road</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupied</td>
<td>8044</td>
<td>$362,000</td>
<td>$326,000</td>
</tr>
<tr>
<td>Vacant</td>
<td>1975</td>
<td>$89,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>Other</td>
<td>4607</td>
<td>$207,000</td>
<td>$186,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>14626</td>
<td>$658,000</td>
<td>$592,000</td>
</tr>
</tbody>
</table>

The indications are that freeholding/long term lease would yield relatively small capital sums to fund future development. It is recommended however that the Recreation Code A lots in Area D could be made freehold or offered under a long term lease.
6.4 Usage Charges

6.4.1 The current system for Mundoo

Cassowary Coast Regional Council currently contracts with Avdata to collect fees based on landings and triggered by aircraft radioing in prior to landing. Charges for 2012/13 were:

<table>
<thead>
<tr>
<th>Innisfail (Mundoo) Aerodrome – User Charges</th>
<th>Itinerant $ (incl GST)</th>
<th>Permanently based (50% discount if paid within 30 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Single Engine</td>
<td>Per landing 10.90</td>
<td>5.45</td>
</tr>
<tr>
<td></td>
<td>Per day maximum 42.50</td>
<td>21.25</td>
</tr>
<tr>
<td>Private Twin Engine</td>
<td>Per landing 10.90</td>
<td>5.45</td>
</tr>
<tr>
<td></td>
<td>Per day maximum 42.50</td>
<td>21.25</td>
</tr>
<tr>
<td>Commercial</td>
<td>Per landing 10.90</td>
<td>5.45</td>
</tr>
<tr>
<td></td>
<td>Per day maximum 42.50</td>
<td>21.25</td>
</tr>
<tr>
<td>Defence Force Aircraft</td>
<td>Per landing 400.00</td>
<td>-</td>
</tr>
<tr>
<td>Helicopter</td>
<td>Per landing 6.60</td>
<td>3.30</td>
</tr>
<tr>
<td></td>
<td>Per day maximum 26.00</td>
<td>13.00</td>
</tr>
<tr>
<td>Ultralight</td>
<td>Per landing 6.60</td>
<td>3.30</td>
</tr>
<tr>
<td></td>
<td>Per day maximum 26.00</td>
<td>13.00</td>
</tr>
</tbody>
</table>

The following table gives records from Avdata of new invoices issued and receipts by calendar years.

<table>
<thead>
<tr>
<th>Avdata Records New Invoices &amp; Receipts</th>
<th>New invoices</th>
<th>Receipts</th>
<th>Owing at end</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$10,093</td>
<td>$9,760</td>
<td>$7,085</td>
</tr>
<tr>
<td>2011</td>
<td>$28,394</td>
<td>$14,431</td>
<td>$19,803</td>
</tr>
<tr>
<td>2012</td>
<td>$30,150</td>
<td>$39,685</td>
<td>$3,635</td>
</tr>
<tr>
<td>Total</td>
<td>$68,637</td>
<td>$63,876</td>
<td></td>
</tr>
</tbody>
</table>

The lift in landings in 2011 and 2012 is evident in the most recent new invoices issued.

The charges offer a 50% discount if paid in 30 days for permanently based aircraft. There can be a lag in receiving payments. The indications are that average invoice rendered is of the order of $5.80 per landing recorded in 2012 up from $2.80 in 2010.

Analysis of Avdata results for Mundoo for 2012 indicated a total of 140 different entities had new invoices raised against them. Of the $30,000 of new invoices, about $13,000 could be attributed to aircraft located at the airport with the great bulk of this attributable to two operations. Most other permanently based operators paid no significant amount. The balance of about $17,000 came from users located elsewhere. Actual receipts by Council would be less than this due to the 15% Avdata fee.
In some airports, fees are negotiated on an annual basis to avoid providing an incentive to not radio in. Discussions with operators located at the airport resulted in most indicating that they would prefer a flat annual user charge.

### 6.4.2 User charges elsewhere in Australia – per landing & annual

The following looks at fee structures elsewhere. Analysis of per landing charge for other airports in Australia indicate that there are a number of approaches being taken. Of the 146 Avdata listings, some 74 had simple per 1000kg MTOW charges although quite a few had minimums and parking extra. They ranged (per ‘1000 MTOW) as follows:

- $ below 7 ......................... 2
- $7 – 8............................ 19 (7 were Torres Strait Is at $7.50)
- $8 – 9............................. 9
- $9 – 10........................... 7
- $10 – 11.......................... 8
- $11 – 12.......................... 2
- $12 – 14........................... 15
- $15 – 19............................ 9
- $20 plus .......................... 5

**Total.......................... 76**

Average was $17.58
Median (half above half below) $9 - $10

A further 13, including Innisfail, had lower charges for helicopters. Of these, four had lower fixed wing charges than Innisfail and eight had higher. Average was $12.16, ie. above Innisfail. For the helicopters, five had flat charges ranging from a low of $5.45 to high of $20 with an average of $14.67. The other eight had 1000kg MTOW rates from $4.54 to $7.50 with average $6.07, ie. about the same as Innisfail.

Some nine had flat landing fees ranging from $6.50 through to $72.73. Most of the high ones were remote Aboriginal communities. Some 40 had weight qualifications. Some five of these involved exemptions under a certain weight, usually 1500kg or 2000kg MTOW. Some 22 had sliding scales depending on MTOW, most having higher fees for larger aircraft but two with reducing rates. There were some who had per passenger charges over a certain weight. Many had additional parking fees. Some had additional night time rates. One had an invoice charge of $20.

### 6.4.3 Users Group Survey

The Users Group have also carried out an independent survey of some 18 other aerodromes to look at charges for fixed wing aircraft with the following results.

**“Free of charge**

Two had no charges whatsoever. A third charged only those permanently based, with all itinerant movements free. A fourth only charges commercial operators.

**Exemption based on weight**

Of the 16 aerodromes that charged any landing fees, five provided exemptions based on weight. Three were free of charge below 2,000kg, one was free of charge below 1,500kg, and the other below 1,000kg respectively.
Per annum fees
Of the 16 aerodromes that charged landing fees, 12 have a per annum payment option available, two of these are by negotiation with the council, the other 10 have published fees.

The published per annum fees were based on weight in 40% of cases, with an average charge of approximately $485 per tonne MTOW.

In the other 60% of cases, the per annum fees were fixed per aircraft, regardless of weight, with an average of approximately $675 per aircraft. There are a few cases where aircraft were charged less if they were solely for personal use.

Note that in most cases, there was an annual parking fee additional to these charges if an aircraft was not hangared.

Landing fees per landing
Of the 18 aerodromes surveyed, 15 charged some form of fee on a per landing basis. In 75% of cases, this was based on weight, with an average of $11/1,000kg MTOW. In the remaining cases, it was an average fixed fee of $10 per landing regardless of weight.

All of the aerodromes that charged fees on a per landing basis also had a per annum option, with the exception of two.

6.4.4 Parking
Approximately half the aerodromes surveyed had parking fees in some form. Most who charged parking fees had both a daily and a per annum rate. The average was $410 per annum regardless of weight. This excludes one aerodrome that charged $2,000 per aircraft. One aerodrome had yearly parking fees based on weight.

6.4.5 Annual user fees for permanently based aircraft
The User Group suggested:

“Suggested annual fees for permanently based aircraft:

- All recreational and private AC <= 2000 kg MTOW permanently based at the airport should be $200.00 per AC per annum.
- This would total approximately $3,000.00 p.a. for AC on field. At present no fee is collected for these AC.
- Commercial Fix wing AC $485.00 per 1000kg MTOW P.A.
- This would total approximately $7,760.00 p.a. for AC on field.
- Commercial Helicopters AC $250.00 per 1000kg MTOW P.A.
- This would total approximately $1,000.00 p.a. for AC on field.
- This would be a total of about $12,000.00 in landing fees from all permanently based aircraft at Mundoo.”

“The above charges should only be for those who register with council and pay in advance on a set date once per year. Upon failure to pay by set date the fee should be doubled, which would take into account councils current concession of 50% reduction in fee for advance payment of landing fees."
Instigation of the above should remove the current practice of AC not using the radio to prevent charging of landing fees, which causes a serious safety risk at the airport.

It will also encourage a safety culture at the airport as resident AC will tell other AC coming in to use correct radio protocol when landing so that all are paying their way.

At the moment some pilots are not using their radio for fear of having to pay landing fees."

**Analysis and Recommendations**

Thus overall, landing charges at Mundoo are about middle range for fixed wing aircraft, but lower than average and one of the relative few with lower charges per kg MTOW for helicopters. It has no parking fees.

While it is important to offer a fixed annual alternative for aircraft permanently based, this needs to be at a level that does not disadvantage Council revenue but on the other hand, does not result in a loss of competitiveness.

There is also a question of whether the operator is a ‘lessee’ who also contributes by way of lease rentals to the costs of the airport, or uses a non Council property next to the airport and only accesses the airport land for operations.

Analysis of Avdata records indicates that the charges proposed by the user group would result in a small net loss over the 2012 new billings of about $1000 and taking into account Advdata charges no loss.

While it will bring in additional income from users not currently paying, the user group’s recommendations would result in a very large reduction in revenue from the major commercial operators.

It is recommended in principal that fees be structured:

a) Recreational and private aircraft of less than 2000kg MTOW permanently based at the airport and hangared on airport land pay a flat annual user fee.

b) Commercial fixed wing aircraft permanently based at the airport and hangared on land leased from the Council have the option of paying a flat annual user fee based on MTOW.

c) Commercial helicopters permanently based at the airport and hangared on land leased from the Council pay a flat annual fee based on MTOW.

d) Users permanently based at the airport other than on land leased from the Council have the option to pay an annual negotiated user charge.

e) In addition to the above, aircraft parked on airport land and not in a hangar, pay an additional charge for parking per day or have the option of paying a flat annual amount.

f) All other aircraft pay a user fee per landing through the Avdata system but with per landing charges for permanently based aircraft lower than for other users.

Upon adoption of this system, Council and the Users Group should work with the relevant authorities to ensure that ‘radio in’ requirements are policed. Evidence available indicates that the landing charges are typical but below average. It is recommended that the following landing charges apply involving an approximate 10% increase over current levels.
Per Landing Charge

<table>
<thead>
<tr>
<th>Innisfail (Mundoo) Aerodrome – Proposed User Charges</th>
<th>Itinerant $ (incl GST)</th>
<th>Permanently based (50% discount if paid within 30 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Single Engine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per landing</td>
<td>12.10</td>
<td>6.05</td>
</tr>
<tr>
<td>Per day maximum</td>
<td>47.30</td>
<td>23.65</td>
</tr>
<tr>
<td>Private Twin Engine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per landing</td>
<td>12.10</td>
<td>6.05</td>
</tr>
<tr>
<td>Per day maximum</td>
<td>47.30</td>
<td>23.65</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per landing</td>
<td>12.10</td>
<td>6.05</td>
</tr>
<tr>
<td>Per day maximum</td>
<td>47.30</td>
<td>23.65</td>
</tr>
<tr>
<td>Defence Force Aircraft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per landing</td>
<td>440.00</td>
<td></td>
</tr>
<tr>
<td>Helicopter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per landing</td>
<td>7.70</td>
<td>3.85</td>
</tr>
<tr>
<td>Per day maximum</td>
<td>28.60</td>
<td>14.30</td>
</tr>
<tr>
<td>Ultralight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per landing</td>
<td>7.70</td>
<td>3.85</td>
</tr>
<tr>
<td>Per day maximum</td>
<td>28.60</td>
<td>14.30</td>
</tr>
</tbody>
</table>

6.4.6 Annual charges

It is recommended that annual fee options for aircraft permanently based at the airport be:

- Category (a) above recreation & private ................... $200 pa
- Category (b) above commercial fixed wing ............... $485 pa 1000kg MTOW or part thereof
- Category (c) above Commercial Helicopter .......... $250kg pa 1000kg MTOW or part thereof
- Category (d) non lease/off airport permanently based usage - to be negotiated based on likely frequency of usage
- Category (e) above parking fees -
  - permanently based aircraft)......................... $5 per day (annual option $300)
  - non-permanently based aircraft) ............. $10 per day

It is recommended that where annual fees are to be paid, they be payable by a set date and if not paid, increased by 100%.

Based on information from Avdata for 2012, it is estimated that the above will result in an increase of about $7000 per annum in additional revenue from user charges. It will however, require some addition of Council administrative costs:

a) To negotiate new arrangements with Avdata;
b) To administer annual charges;
c) To negotiate annual charges with permanently based operators not on airport land.
**Per Passenger Charge**
Currently Council do not levy a per passenger charge.

The following table gives some current passenger charges for airports in the region and some smaller airports elsewhere in Australia.

**Mildura**
- Passenger using terminal $12.19 plus GST per movement.

**Dubbo**
- Vary between airlines and routes $2.85, $6.62, $13.30 plus GST.

**Mt Isa**
- Aeronautical pax.......................... $13.30
- Terminal usage........................... $7.10
- Pax screening............................ $2.90
- Checked bag screening............... $2.90

**Horn Island**
- Outbound pax............................ $27.50
- Outbound security screening......... $33.00

As an indication, one 30-passenger RPT service a week at an inbound and outbound passenger charge of $10 would yield income of $30,000 a year, ie. equivalent of all current user landing charges.

It is recommended however that no passenger charge is levied at this point of time and into the foreseeable future as a measure to attract passenger FIFO and RPT business. However if substantial works need to be carried out in the future to cater for services by aircraft 30 pax and above, this policy would need to be reviewed.
6.5 Management

6.5.1 Sale to a private operator
The earlier Aerodrome Demand Study indicated there was no market for possible sale of this type of airport.

Since then, Longreach airport has been sold for a reported $4m to the group that owns and operates Cairns, Gold Coast, Mackay, Townsville and Mt Isa airports. However Longreach airport has significant RPT traffic of about 30,000 passengers a year with potential to generate substantial revenue from passenger charges (eg. @ $10 per pax, $300,000 pa.).

No indication of a market for airports of Mundoo’s type was indicated during discussions and research. However in the process of the research, it was indicated that private interests have in the past looked at the airport as an investment but concluded that there was not sufficient Council land surrounding the strip to make it an attractive proposition.

6.5.2 Outsource of management
Substantial outsourcing of airport management is taking place around Australia.

Most are airports located at mining operations. However one company has a contract to manage a number of the airports at Aboriginal and Islander communities on behalf of the Queensland Government. Shire of Halls Creek in the East Kimberley region contracts with a company specializing in this field based in Perth with a staff of 50.

Arrangements would need to be negotiated. However indications are that an arrangement might be as follows.

- The company would place an experienced person at the airport with a person relieving for holidays.
- The person would attend industry events to keep up to date with regulatory and other relevant developments.
- Key staff of the company would visit periodically on inspections to check compliance.
- The company would have a computer program that the manager would follow.
- The company would ensure that the airport is and continues to be compliant.
- The airport manager would monitor all aircraft movements, and administer the collection of casual visit fees using the same data as Avdata as part of their tasks. This would save the current 15% fee to Avdata.
- The manager/company would attend to simple maintenance, eg. mowing, cleaning, marker maintenance, etc.
- The indications are that such an arrangement would probably cost of the order of $200,000 - $250,000 a year, but cost would be defrayed by income.
- It may be possible to negotiate an incentive system whereby, if the management company attracts new business, it keeps part of it.

Overall, it seems unlikely that the Council would achieve a reduction in costs.
The main advantage would be that the Council could be assured that the airport was kept fully compliant, up to date with trends in the sector, and with incentive arrangements, have a company aggressively seeking to attract more business.

While the Council might hold discussions with companies offering management services, it seems unlikely at this stage that scale of usage and revenue would justify this arrangement. However if the airport goes to ‘Certified’ level with RPT services 30 pax or more, possibility of outsourcing management could be reviewed again.

6.5.3 Council management
The Master Planning process has indicated that Council arrangements to ensure that the airport remained fully compliant are in need of attention.

The current indications from the analysis of Council accounts, compared with the costs of outsourcing management indicates that the Council is probably managing the airport at a fairly low level. Given past revenue this is probably understandable.

However maintaining full compliance is important. This can be achieved by devoting internal resources within Council to management and seeking specialist outside advice and assistance.

There are two avenues of specialist advice for the Council:

1) The Council needs to have access to aviation specialists to advise on technical/compliance aspects.

2) Council staff need to access specialists to train them so that they are fully aware of compliance requirements.

The following gives indicative costs that would need to be budgeted for if the airport becomes certified.

As a general statement, a wages budget of $40,000 per annum should be adequate.

A list of matters that staff would need to attend to is given in the full (Research) Report.

Assuming the Aerodrome Manual, Safety Manual, Security Manual and Aerodrome Emergency Procedures are in place, approximate annual costs of outside specialist services are estimated at:

Annual technical inspection, approximately .....................$8,500

Annual OLS survey .................................................................$5,500

Aerodrome Reporting/Works Safety Training
(carried out with minimum of 6) ...........................................$6,500 (every 5 years)

Auditing of security Manual (if airport has security) ............$4000

Estimated average annual cost, approximately ........$20,000
6.6 Commercial Aspects of Future Development

6.6.1 Development of recreation/Airpark lots
It is proposed that an Airpark approach be taken to developments along the grass strip, especially in the Southern and Western Sectors. There are two types of potential development:

1. Hangar lots for recreation flyers.
2. House hangar lots.

*Hangar House Lots*
It would seem that the Area D in the western segment (next to the parachuting operations) would be best suited for house/hangar lots. The lots could be freehold but long term lease up to 99 years would retain more control.

The Whitsundays WAVE development offered 31 lots ranging from 780 sq m to 1420 sq m but not in the 1000 – 1100 sq m range. Original asking prices were mainly in the $500,000 - $600,000 range. About half (ie. about 15) were sold and six have been built on. However more recent sales have been around the $300,000 mark. At Atherton, there are two types of developments. Zoned rural residential land with access to the airport has been developed with house/hangar combinations. A recently recorded sale in November 2007 for one lot of 4,374 sq m was for $285,000.

The above indicates there is a potential small specialist market for house/hangar developments. Translating this to Mundoo would seem to indicate a potential market for say 1500 sq m lots at about $200,000 a year freehold, say $180,000 long term lease.

The Council owned area in the Western Sector next to the main runway could accommodate approximately 12 lots with a potential sale value in 2013 dollars of the order of $2.2m.

*Recreation Aircraft Hangar Lots*
The Area A on the margin of the grass strip in the southern segment is estimated to be able to be developed with upgrading of Cardier Road and a service road to accommodate 20 recreation hangars with lot sizes of 20m x 17m, ie. 1020 sq m. At a current rental of $4.50 sq m, eventual revenue potential is of the order of $91,000 per annum.

6.6.2 Commercial hangars
The following is to give some idea of potential revenue increases of additional hangar development. It is estimated the extra hangar areas removal of the NDB would increase space available by about 80% with potential additional revenue at current rates of $4.50 sq m of approximately $55,000 per annum. Proposed additional Code A hangar development in the Motel area is estimated to provide for approximately 8,800 sq m of additional lots with a potential eventual revenue in current prices of $40,000 per annum.

*Code C Hangars*
Area for a Code C hangar is estimated at 30m x 34m, ie. 1020 sq m with a potential revenue @ $4.50 sq m of $4590 per annum for each hangar.

*Market for Hangar Shed Space*
Information from Mareeba Aerodrome indicates that hangar space leases is about $60 - $70 sq m per annum. Lease of industrial sheds in the Mundoo area is estimated at about $80 sq m per annum.
7.0 MASTERPLAN RECOMMENDATIONS

7.1 General
The following Masterplan Recommendations have been developed following analysis of the three options and input from the Cassowary Coast Regional Council Steering Committee.

They are based on:

1) A preference for the Council working with private landowners to develop facilities, rather than acquiring additional areas and meeting costs of development itself.

2) A concern about costs of development of the Northern Sector including dump remediation.

Map #14 illustrates. It should be noted that the proposed designation of land seems likely to meet airport development needs beyond a 20-year horizon.

7.2 Masterplan Recommendations

1) Designate areas of privately owned land shown for main strip extension and taxiway development for future airport development.

2) Designate the area shown at the south western end of the grass strip for parachute landing zone.

3) Designate areas as shown of privately owned land in the Southern Sector for future airport development, with the area fronting the main strip designated as being required for development of hangars for commercial aircraft including meeting a need in the future for hangars for larger aircraft Class 3C and the area along the grass strip for recreation aviation purposes.

4) Designate the privately owned and Council owned land in the Western Sector as shown for airport development for tourism and recreation purposes.

5) Designate the privately owned and Council owned land in the Eastern Sector as shown for future transport hub/industry development.

6) Reserve the area of Council land in the Eastern Sector around the current tarmac/apron as shown for future tarmac/apron, terminal, office, flying school and parking development and eventual relocation of the small hangars in the area to other locations.

7) Reserve the Council area in the Eastern Sector around the NDB for light aircraft commercial users with eventual relocation of hangars for recreation users to other locations.

7.3 Land Use Town Planning

It is recommended:

1) That Council include into the Town Planning Scheme appropriate provisions and land use designations to support the above recommendations.

2) That under the Town Planning arrangements, a wider Aerodrome Protection Area be established as set out in Map #15.
Map #14 – Land Use/Town Planning Recommendations
Map #15 – Airport Protection Area
7.4 Implementation Timing

7.4.1 General
The foregoing provides for likely and possible needs well into the future with a view to ensuring that short term decision making does not compromise longer term development opportunities.

The following seeks to envisage likely timing and key decision points ranging into the future.

7.4.2 Decisions and actions needed over the next year

Safety
Works need to be carried out to render the airport safe and compliant.

OLS Obstructions – These comprise tree growth, have been brought to the attention of Council staff and we believe attended to. (Assuming tree growth has been attended to, an OLS update survey is required to enable the published supplementary information in ERSA RDS to be amended and be current.)

Wallabies – Wallabies moving on the strip are a potential hazard and liability risk. In meeting this need, the eventual need for high security fencing if the airport goes to ‘Secured’ level needs to be kept in mind.

Taxi lanes - need to be marked in the NDB area to be compliant with regulations.

Loose Stones - There is a need to roller and sweep as a short term measure. Any further sheeting should bear in mind an eventual need to take runway strength to PCN16.

Airport Description - Deficiencies in descriptions in airport information publications brought to the attention of staff need to be attended to, if not already.

Management
Council needs to have staff responsible for the management of the airport prepare and present a management plan that ensures that the airport remains compliant with all regulations, including on-going engagement of outside consultants for inspections and training.

As part of the management plan, the accounting procedures needs to be reviewed with a view to separate detailed annual revenue and costs being available to Council.

The Council needs to review the recommendations in this report about fees and charges and lease arrangements with a view to adoption of new arrangements.

Town Planning
The town planning recommendations in this report need to be reviewed with a view to incorporation in the new town plan being prepared.

7.4.3 Decisions and actions needed roughly in a 2 to 5-year time frame

Recreation Lots
It seems likely that decisions may need to be made in this time frame in relation to opening up lots for recreation users in the designated potential area.

Business Code A
Depending on demand, there may be need for decisions about developing lots outside the existing areas for hangars for this class of aircraft.
NDB
On the basis of current information, it seems likely that a decision would have been made before this time frame to decommission to NDB opening up the opportunity to release more Business Code A lots in that area.

7.5 Five to Ten-Year Period

Estimated Cost of Movement to Certified Airport Level
It would seem that by this period, demand for regular movements by aircraft carrying 30 passengers or more may have developed and expenditure will need to be made on perimeter security fencing ($1.340M), and configuration of road access and fencing in the NDB area, even if the NDB has not been removed to meet airside security requirements.

Apron
It is likely that first phase of apron upgrade may be needed at estimated cost of $0.641m.

7.6 Ten to Twenty-Year Period & Beyond

Code 3C Aircraft Operations over 50 Passengers
If Code 3C (larger regional) aircraft operations are to develop, it seems likely that they would develop in this time frame.

This would trigger expenditure needs in three phases:

1) Need to bring runway pavement strength up to PCN16 and to lengthen the main runway and expand the apron area ($8.805m);

2) Possible need for Code C hangars that would need to be located either on current private land on the southern side of the main strip ($1.594m), or, in the Northern Sector (up to $2.524m);

3) If a number of aircraft operations on the main strip built up strongly, then a Code C taxiway may need to be developed ($0.990m).

Transport Hub/Industrial Land
It is envisaged that during this time frame, demand may have developed for development of the area designated for transport hub/industrial uses involving cost of a direct access road from Douglas Road.
MUNDOO AIRPORT
MASTERPLAN

APPENDICES
APPENDIX 1a

OBSTACLE LIMITATION SURFACE

[Map image showing various geographical features and structures relevant to airport planning and development.]
TYPICAL HANGAR LAYOUTS

APPENDIX 2

TYPICAL HANGAR LAYOUT USED FOR RECREATIONAL CODE A AIRCRAFT (WING SPAN 12 M MAX, MTOW LESS 5700 Kg)

- Road Reserve 00m
- Car 12m
- Building Area Average width 15 m 17m
- Licence Area for ACft/Equipment Parking 32m
- Leased Area
- 47m
- Taxilane Code A ACFT 71m

TYPICAL HANGAR LAYOUT USED FOR BUSINESS CODE A AIRCRAFT (WING SPAN 15M MAX, MOTW LESS 5700 Kg)

- Road Reserve 00m
- Car Parking 12m
- Car Parking 27m
- Building Area Average width 20 m
- Leased Area
- Licence Area for ACft/Equipment Parking 52m
- Leased Area
- 67m
- Taxilane Code A ACFT 91m
TYPICAL HANGAR LAYOUT USED FOR BUSINESS CODE C AIRCRAFT (WING SPAN 36M MAX)

Road Reserve 00m

Car Parking 12m

Building Area
Average width 40 m 27m

Licence Area for
ACft/Equipment Parking 67m

Taxilane Suitable for Dash 8-400 104m

Leased Area
PROPOSED LAYOUT RECREATION/AEROPARK
LOTS: RWY 03/21

Light aircraft (less 5700 kg) parking area. Entry from Wilson Rd or Aerodrome Perimeter Rd

Area between Acft Parking Limit and runway strip edge cannot have any obstructions; either temporary or permanent

NOTE: Centre line of existing RWY is at approx. chainage 95m

Building area. Can be a mixture of hangars, Aeropark. Start Aeropark south end and hangars north end
Map – Runway Extensions, Widening & Code C Parallel Taxiway
Map – Layout After Removal of NDB
Map – Grass Cross Strip Truncation Option
DETAILED PLANS - OPTION 2
DETAILED PLANS - OPTION 3

CONFIDENTIAL