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**Tamworth Regional Airport | Master Plan 2015
For Tamworth Regional Council**

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MASTER PLAN FIGURES

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GLOSSARY OF TERMS & ABBREVIATIONS

ACN (Aircraft Classification Number)	A number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.
ASV	Annual Service Volume
Aerodrome	A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.
AFRU (Aerodrome Frequency Response Unit)	The AFRU is an electronic, ground based, aviation safety enhancement device, intended for use on the CTAF or MBZ frequency at non-controlled aerodromes.
AIP ERSA	Airservices Australia Aeronautical Information Package En-Route Supplement Australia
ANEF	Australian Noise Exposure Forecast
ARC (Aerodrome Reference Code)	A code used 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: the first is a number (from 1 to 4) related to the aeroplane reference field length and the second is a letter (from A to F) related to the aeroplane wingspan and outer main gear wheel span.
ARP	Aerodrome Reference Point
ATC	Air Traffic Control
AWIS	Automatic Weather Information Service
AWS	Automated Weather Station
BoM	Bureau of Meteorology
CAGR	Compound Annual Growth Rate
CASA (Civil Aviation Safety Authority)	The Australian federal government department responsible for setting and maintaining safety standards for civil aviation. CASA is responsible for the codification of international standards and recommended practices into Australian legislation and for the issue of licences for aviation personnel including pilots, amongst other responsibilities.
CASR (Civil Aviation Safety Regulation)	CASRs establish the regulatory framework (<i>Regulations</i>) within which all service providers must operate.
Council	Mid-Western Regional Council
CTAF	Common Traffic Advisory Frequency
FAA	Federal Aviation Administration (United States Department of Transportation)
General Aviation (GA)	The sector of the aviation industry that does not include regular public transport (RPT) airlines and military aviation.
GPS	Global Positioning System
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation

IFR/IMC (Instrument Flight Rules/ Instrument Meteorological Conditions)	Refers to rules under which flight involving navigation requiring reference to radio navigational aids or instruments is carried out. Weather conditions below a certain minima are referred to as instrument meteorological conditions (IMC). IFR flight requires pilots to be qualified in the use of instrument navigation and to use radio navigational aids provided at airports.
INM	Integrated Noise Model
IWI	Illuminated Wind Indicator
LIRL	Low Intensity Runway Lighting
LoS	Level of Service – a range of values or assessments of the ability of the terminal to meet demand
MOS	Manual of Standards
MTOW	Maximum Take-off Weight
Navaid	Commonly-used abbreviation for 'radio navigational aid'
NDB (Non Directional Beacon)	A simple and common type of radio navigational aid which allows pilots to track to or from its location.
Non-precision instrument approach	An instrument approach and landing that uses lateral guidance but does not use vertical guidance.
OLS	Obstacle Limitation Surfaces
PAL	Pilot Activated Lighting
PANS-OPS	Procedures for Air Navigation Systems – Aircraft Operations
Pavement Classification Number (PCN)	A number expressing the bearing strength of a pavement for unrestricted operations by aircraft with ACN value less than or equal to PCN.
Payload	The total weight of passengers and cargo that an aircraft can carry.
PSI	Unit of pressure or stress (pounds per square inch)
RESA (Runway End Safety Area)	Area provided at the end of a runway strip, to protect the aeroplane in the event of undershooting or overrunning the runway.
RFDS	Royal Flying Doctor Service
RNAV/GNSS Approach	Area Navigation/Global Navigation Satellite System Approach. A form of instrument approach procedure using signals from orbiting satellites to determine an aircraft's precise position at a point in time.
RPT (Regular Public Transport)	Air services operated by airlines that are scheduled to occur on a regular basis at fixed times or frequencies and on fixed routes.
RWS (Runway Strip)	A defined area including the runway and stopway, intended to reduce risk of damage to aircraft running off a runway and to protect aircraft flying over it during take-off or landing operations.

**VFR/VMC (Visual Flight Rules/
Visual Meteorological Conditions)**

Refers to rules under which flight involving navigation solely by reference to visual cues (rather than requiring reference to radio navigational aids or instruments) is carried out. VFR flight is permissible only when meteorological conditions (cloud base and visibility) are above defined limits. Such conditions are referred to as visual meteorological conditions (VMC). VFR flight does not require pilots to be qualified in the use of instrument navigation, nor does it require expensive radio navigational aids to be provided at airports.

WI

Wind Indicator

1.0 INTRODUCTION

REHBEIN Airport Consulting was commissioned by Tamworth Regional Council (Council) to prepare this 2015 Master Plan for Tamworth Regional Airport. The Master Plan establishes a framework for the future development of the airport and addresses the existing airport activities as well as opportunities for growth in aviation and aviation-related activities.

The Master Plan sets out short, medium and long-term proposals for aeronautical and non-aeronautical development within the airport land and identifies opportunities for adjacent airport-related development consistent with the Tamworth Regional Local Environmental Plan 2010.

1.1 PURPOSE OF THE MASTER PLAN

Airport master planning is undertaken to enable best-management practises and sound land-use development in addressing diverse aviation and community interests. An Airport Master Plan is the primary strategic tool available to airport owners and operators and communicates the operator's intentions with respect to development of the airport. Its purpose is to set out a long-term framework for the development of all facilities within the airport that protects future development against the effects of current decisions.

This Master Plan presents a strategy for development of the airport for at least the next 20 years, taking into account demand forecasting and Council's specific development objectives. The Master Plan should be reviewed at regular intervals to ensure that the airport planning and development retains its currency with evolving economic, commercial, environmental and technological changes.

Consistent with these strategic considerations, the *Airports Act 1996 (Cth)* summarises the aims of an Airport Master Plan as follows:

- Establishing strategic direction for the efficient and economic development of the airport over the planning period;
- Providing for the development of additional uses of the airport site;
- Indicating to the public the intended uses of the airport site; and
- Reducing potential conflicts between uses of the airport site, and to ensure that uses of the airport site are compatible with the areas surrounding the airport.

Although the *Airport Act 1996 (Cth)* does not have statutory application to Tamworth Regional Airport, this does not reduce the relevance of these four key aims.

1.2 PLANNING HORIZON

The Master Plan relates to a planning period of 20 years and extends to 2035. This is the normal planning horizon for which detailed planning parameters such as traffic forecasts and aircraft noise impacts have been considered.

However, it should be borne in mind that the Master Plan does not make rigid predictions regarding the timing of particular developments; as such, not all development indicated within the Master Plan may necessarily occur prior to 2035, dependent on actual demand. An Indicative Development Staging Plan has been prepared for short (2015-2020), medium (2020-2030) and long-term (beyond 2030).

1.3 VISION

The New England North West Region enjoys a diverse economy, driven by service industry, agriculture, tourism, mining and aviation. Tamworth Region is a vibrant, growing and attractive destination for business and investment and Tamworth is the regional centre for industry and commerce.

Tamworth Regional Airport is the gateway to the New England North West region for the business traveller, professional and tourist, and provides aviation training to pilots nationally and internationally.

The Tamworth Regional Council's vision for the airport is to ensure its full potential is realised while providing a net financial return to Council, as the airport owners and through the Council to the community.

1.4 DEVELOPMENT OBJECTIVES

The aim of the Master Plan is to establish development objectives which allow Council to achieve its vision for the airport. The overall goal is to provide for facilities and operations at Tamworth Regional Airport to a standard commensurate with the major role the airport plays in the continuing economic growth of the region and its evolving transport needs. To achieve this goal, Council identified development objectives that would:

Operations

- Facilitate the safe and secure movement of aircraft, passengers and freight;
- Provide a clear and coherent plan to guide future airport infrastructure development, which meets the needs of all current and future airport users in a balanced and equitable fashion;
- Ensure the timely delivery of new and improved airport facilities;
- Protect the airport and its operations from incompatible development and activities external to the airport;

Economic and Social

- Support the existing airport activities as well as facilitating aviation infrastructure to accommodate and encourage growth of the airport's role as the training, business and tourist gateway;
- Encourage the expansion of aviation facilities to enhance and improve economic return from the existing airport asset;

- Incorporate Council land adjacent to the airport site for possible future aviation-related activity growth;
- Encourage the expansion of regional and domestic airline, charter and medical emergency services operations;
- Facilitate wider opportunities with respect to heavy aircraft maintenance and international freight operations; and

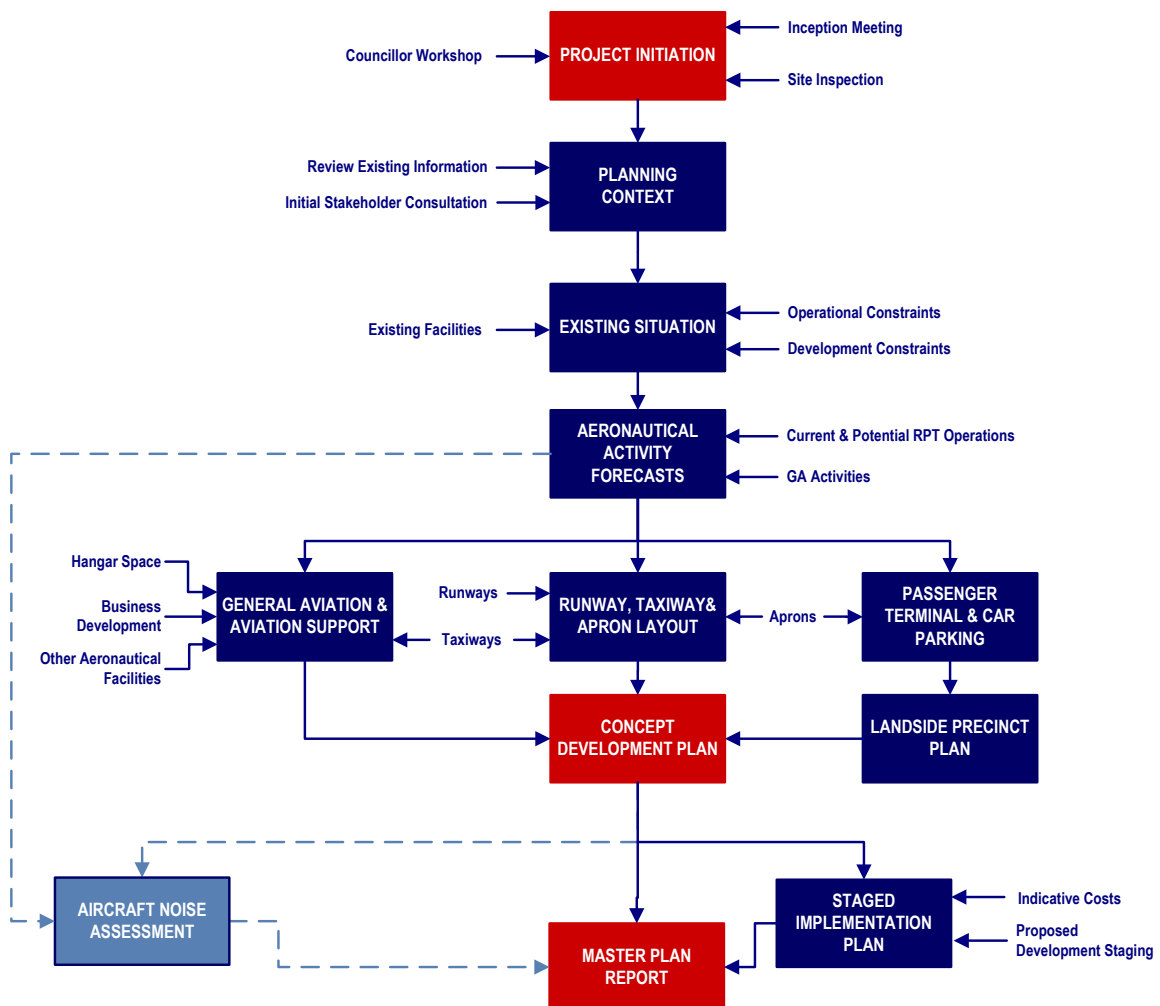
Environment

- Optimise the utilisation of the airport with minimum environmental impact.

1.5 METHODOLOGY

The planning process adopted in preparing this Master Plan is summarised below in **Figure 1**.

Figure 1: Methodology workflow



The principal steps in the preparation of this Master Plan were as follows:

- To gain an understanding of the planning context for this Master Plan the following was undertaken:
 - Stakeholder consultation was undertaken to solicit the views issues and concerns of key stakeholders (discussed further in **Section 2.6**); and
 - Existing information, including Council planning and economic development documents, was reviewed.
- A review of existing infrastructure, facilities and activities at the airport was undertaken;
- Based on consultation with the stakeholders and consideration of the local economy, economic and business development opportunities for the airport were considered and reviewed;
- Development constraints on development at the airport site were reviewed based on information gained during the stakeholder consultation;
- Historical activity levels were identified as a baseline for aeronautical activity forecasts.
- Aeronautical activity forecasts were developed using a scenario analysis to maintain flexibility in the planning approach for identifying adequate infrastructure requirements to support forecast growth;
- Forecasts of future aviation activity were integrated into developing development concepts for planning adequate infrastructure requirements;
- Aeronautical infrastructure development proposals were set including upgrades to runways, apron, taxiways, supporting services and proposals for aviation-related development were developed. This provided the overall Concept Development Plan for the airport, with specific layouts for airport precincts;
- An implementation plan was then developed including a indicative development staging plan formulated to provide guidance on the implementation of the proposals as well as indicative capital cost estimates; and
- An Australian Noise Exposure Forecast contour map was prepared and endorsed for technical accuracy by Airservices Australia to allow inclusion in the LEP.

1.6 AIRPORT MASTER PLAN STRUCTURE

This Tamworth Regional Airport Master Plan 2015 is structured as follows:

- This section has set out the planning context to this Master Plan, including development objectives, stakeholder consultation,
- **Section 2.0** identifies the planning context of the airport within the New England North West region and Tamworth Region, associated planning regulatory framework and drivers likely to influence future activity levels and infrastructure requirements

- **Section 3.0** describes the existing situation with regards to infrastructure and activities at the airport, along with associated historic aviation activity;
- **Section 4.0** describes the key economic and business development opportunities for Tamworth Regional Airport, including expected future aviation activity;
- **Section 5.0** describes the proposed development concept in terms of aeronautical and non-aeronautical infrastructure;
- **Section 6.0** outlines an expected implementation plan and staging along with indicative costs for short-term development; and
- Supporting **Figures A through F** illustrating relevant aspects of the Master Plan as referenced within the document are included at **Appendix A**.

2.0 PLANNING CONTEXT

2.1 REGIONAL CHARACTERISTICS

2.1.1 GEOGRAPHY

The Tamworth Regional local government area is located in the New England North West Region of New South Wales approximately 400km north west of Sydney by road (approximately 4½ hours driving time) or 310km (approximately 1 hour) by air, and is 600km from Brisbane. Tamworth is approximately midway between Sydney and Brisbane, with Tamworth Regional Airport being the primary inland airport located on this north-south corridor.

Tamworth is a strategically located major regional centre. Tamworth Regional Council administers the New England North West Region, covering an area in excess of 9,500 km² extending from the Nandewar Range north of Barraba, south east to Peel and the Great Dividing Ranges. The Council centre is located at the intersection of the New England Highway (A15) and the east-west aligned Oxley Highway, which connects Tamworth to one of the eastern Australia's other major inland north/south highways, the Newell Highway (A39). The New England Highway provides access east to the Hunter Expressway (M15) to Newcastle and Pacific Motorway (M1) south to Sydney.

The New England North West region is dominated by the Northern Tablelands plateau with the elevation of Tamworth Regional Airport elevation at 404m. The region has a cool to warm climate with an average monthly maximum temperature of 32.9°C in January and 15.5°C in July. The average monthly minimum temperature varies from 17.4°C to 2.9°C respectively.¹

2.1.2 ECONOMY

Tamworth is a vibrant, growing and attractive destination for business and investment. The Tamworth region is in a strong economic position representing 0.5% of New South Wales Gross State Product.²

The *New England North West Regional Action Plan* describes the region as a unique part of Australia that enjoys a diverse economy, driven by five main sectors based around service industry, agriculture, tourism, mining and aviation.

Service industry

Tamworth is one of the region's primary service-based hubs and is surrounded by rural hinterlands. There has been a shift to services industries, involving food, health, recreation along with retail and business services. The economy is starting to transition to other industries, with retail trade now being the region's largest industry employer with 14.2% of the region's employment, followed by

¹ Bureau of Meteorology, Summary statistics for Tamworth Airport

² Tamworth Regional Council – Economic Overview and 2014 Tamworth Regional Infrastructure Strategy

health care and social assistance (12.8%), manufacturing (11%) and most recently, construction (8%) due to the region's economic development.³

The region has a significant wine industry, which focuses on diversification, marketing and food and wine events such as the Taste Tamworth Festival.

Agriculture

A wide range of agricultural products are exported in the region, including a mix of high quality crops and livestock and livestock products such as fine wool, lambs and cattle. According to the Tamworth Regional Council Economic Overview, the agriculture, forestry and fishing industry sector is 12.5% of the region's employment in 2012/13 financial year.

Tourism

Tamworth has strong destination awareness, strengthened by the annual Tamworth Country Music Festival. The economic benefit of the festival is significant, generating an estimated \$50 million of economic benefit to the community. The festival receives approximately 50,000 visitors every day, making it Australia's largest country music festival and one of the largest in the world.⁴

With countless events and an array of experiences across the year, Tamworth receives over 1.1 million visitors every year. In 2014, tourism alone for the Tamworth region contributed over \$239 million towards the economy.⁵

Mining

The region has a great diversity of mineral deposits ranging from large coal deposits to metallic and gemstones and the most important economic commodities mined. Mining is anticipated to experience growth in extraction of resources that will benefit the region.⁶

Aviation

The New England North West Region also has a strong aviation sector, including training, airline maintenance and aerial agricultural services. The region has a competitive advantage for continued development of expanding aeronautical businesses.⁷

2.1.3 POPULATION

The Tamworth Regional Local Government Area (LGA) had a population of 59,743 and is growing at a rate of 1.3% per annum (source: ABS, 2013). The majority of that growth (85%) is in Tamworth urban area.⁸ Taking into account the surrounding Shires, the Tamworth region services a significant population catchment with over 200,000 people living within two hours of Tamworth.

³ Tamworth Regional Council – Economic Overview (Selection of Exports by industry sector (2012/13)

⁴ Tamworth Regional Council – Economic Overview

⁵ Tamworth Regional Council – Economic Overview

⁶ Tamworth Regional Council – Regional Service Centre Fact Sheet

⁷ NSW Government, New England North West Regional Action Plan 2021

⁸ Tamworth Regional Council – 2014 Tamworth Regional Infrastructure Strategy

Significant population growth is expected in the Tamworth Region as a result of the substantial mining in neighbouring local council areas, development of service industries and education facilities and quality of general liveability. As the largest city in the region, and with the busiest airport, Tamworth is ideally located to leverage these opportunities.

Council is assuming a sustained growth rate of 1.3% per annum over the next 20 years, yielding a population of 70,000 – 75,000 persons.⁹

2.2 ROLE AND HISTORY OF TAMWORTH REGIONAL AIRPORT

Tamworth Regional Airport is owned and operated by Tamworth Regional Council and is located approximately 10 km to the west of the Tamworth CBD. The Oxley Highway forms the northern boundary to the airport, which is bounded to the south by New Winton Road.

The airport is one of the largest regional airports in Australia, occupying an area of approximately 294 hectares. Council also owns a number of land parcels which are contiguous with the Airport. **Figure A** provides a location plan of Tamworth Regional Airport and the Council owned operational land surrounding the airport.

2.2.1 AIRLINES

The airport underpins the critical transport network that provides the region with the opportunity to experience growth and prosperity.

QantasLink operates 37 daily return services between Tamworth and Brisbane and Sydney using a combination of the Bombardier Dash 8-Q400 (74 seats), Dash 8-Q300 (50 seats) and Dash 8-200 (36 seats) turboprop aircraft.

In early 2015, JetGo commenced direct services between Tamworth and Brisbane using Embraer 135 (36 seats) jet aircraft. This service operates seven (7) times per week

On 25 May 2015 Virgin Australia commenced a return Sydney – Tamworth service, operating six (6) days per week using ATR-72 (68 seats) turboprop aircraft.

A wide range of General Aviation (GA) aircraft also operate to and from the airport including private and commercial operators as well as the Royal Flying Doctor Service (RFDS), the Westpac Rescue Helicopter Service (WRHS) and the Rural Fire Services (RFS).

2.2.2 AIRPORT BUSINESSES

A number of other businesses operate from Tamworth Regional Airport including:

- The BAE Systems Australia Flight Training Tamworth complex;
- Australian-Pacific Aeronautical College;
- The QantasLink heavy maintenance base;

⁹ Tamworth Regional Council – 2014 Tamworth Regional Infrastructure Strategy

- Sigma Aerospace, which undertakes aircraft maintenance, repair and overhaul – including engine overhauls for turboprop and piston aircraft engines, and avionics;
- Macquarie Pilot Centre, which runs aircraft charters and conducts advanced flight training; and
- Civil Aviation Safety Authority regional office.

2.3 TAMWORTH REGIONAL AIRPORT MASTER PLAN 2006

The Master Plan for Tamworth Regional Airport was last reviewed in 2006. In addition to reviewing the original 1991 Master Plan, the 2006 Master Plan focused on the provision of a general aviation (GA) centre to accommodate the needs of private aircraft owners and operators and a freight facility to handle overnight freight operations.

The 2006 Master Plan forecast passenger movement growth of 5%, but questioned the justification of such a high growth rate for long-term planning purposes. During the previous 11 years prior to 2006 growth rates had remained relatively flat with no discernible growth pattern observable.

Since 2006, Tamworth Regional Airport has:

- Maintained and grown RPT passenger service with an expanded and upgraded terminal and car parking;
- Built upon the current role of Tamworth as a major flying training facility by attracting international students, continues its role with Defence and is expanding into new areas of training;
- Expanded GA aviation facilities by providing a GA centre and freight facility;
- Upgraded security to implement changes in aviation security arrangements at regional airports; and
- Expanded the terminal facilities to incorporate a Qantas Regional Lounge for its premium passengers.

2.4 PLANNING INTEGRATION

2.4.1 TAMWORTH REGION LOCAL ENVIRONMENTAL PLAN (LEP) 2010

The current statutory planning instrument which determines land use policy for the airport and surrounding area is the Tamworth Region Local Environmental Plan (LEP) 2010, which makes local environmental planning provision for land in the Tamworth Regional Council area. The LEP aims to:

- Encourage orderly management, development and conservation of resources within the region;
- Protect, enhance and conserve important agricultural land;
- Allow flexibility for orderly economic and equitable development while safeguarding the community's interests and residential amenity;

- Manage and strengthen retail hierarchies and employment opportunities and protect heritage items;
- Promote tourism development;
- Guide affordable urban form;
- Promote ecologically sustainable urban and rural development and control the development of flood liable land; and
- Protect, enhance and conserve important agricultural land and secure a future for agriculture by expanding Tamworth's economic base by minimising the loss or fragmentation of productive agricultural land.

The LEP sets out land use zones for the region and identifies the land on which the airport is located as '*SP1 – Special Activities*' which aims to facilitate development that is in keeping with the special characteristics of the site and minimise any adverse impacts on surrounding land.

The land surrounding the airport is predominantly identified as '*RU4 – Primary Production Small Lots*', '*RU1 – Primary Production*'.

Surrounding zoning of land includes '*R1 – General Residential*', '*R5 – Large Lot Residential*' and '*B7 – Business Park*' located to the south of the airport.

2.4.2 NEW ENGLAND NORTH WEST STRATEGIC REGIONAL LAND USE PLAN 2012

The *New England North West Strategic Regional Land Use Plan* was prepared in 2012 and provides a basis for balancing strong economic growth in the region with the protection of valuable agricultural land and sustainable management of natural resources. This plan represents the Government's proposed framework to support growth, protect the environment and respond to competing land uses, whilst preserving key regional values over the next 20 years and informs the Tamworth Region LEP. This will ensure the role of airports and air services in the growth of the region are acknowledged and protect their current and future operations from inappropriate development having regard for height limitations, noise impacts and surrounding development.

A key infrastructure principle of this land use plan is Tamworth Regional Airport is likely to continue to develop as growth occurs.

2.4.3 TAMWORTH REGIONAL DEVELOPMENT PLAN 2010

The *Tamworth Regional Development Plan 2010* conditions development within the Tamworth Business Park, which is located south of the airport. A condition will be imposed on any development consent to require that notification be provided to the Airport Manager a minimum of 21 days before the operation of a crane for building work.

The *Tamworth Regional Local Environmental Plan 2010* also contains controls relating to the construction of buildings within the vicinity of the Tamworth Regional Airport which may impact on the height and construction standards.

2.4.4 TAMWORTH REGIONAL ECONOMIC DEVELOPMENT STRATEGY 2010

The *Tamworth Regional Economic Development Strategy* has been prepared by Council to identify Council's economic development strategy and policy framework. Council's strategies in place to create an environment supportive of business development are supported by the Tamworth Regional Development Strategy. Council endeavours to support businesses who will be major contributors to net new job growth in the region. Key drivers influencing economic development include employment, education, workforce skills, business development, investment, infrastructure, tourism and marketing.

Airports are included in the infrastructure strategic theme as being part of efficient and effective infrastructure that underpins economic activity and fundamental to a prosperous local economy. One relevant long term priority of the strategy is to work with operators to facilitate the improvement of air access to the region through market research, route evaluation and liaison with airlines, airport operators and other relevant government and industry stakeholders.

Tamworth Regional Airport is also recognised in the education strategic theme for BAE flight training for developing a centre of excellence in military training and the Australasian Pacific Aeronautical College in providing the only flexible delivered aero-skills training in NSW. There are specific strategic advantages for the aeronautical industry in the Tamworth region due to the facilities available for training pilots and accommodation available at the airport to house students. The pilot training activities at the airport draws interest from a broad catchment both nationally and internationally.

With direct relevance to this Airport Master Plan, the Economic Development Strategy highlights Council's desire to provide infrastructure that accommodates economic growth and meets the commercial, industrial, educational and retail needs of the region. The Strategy also encourages an attractive business environment by providing adequate local infrastructure to ensure competitiveness of the region's economic activity. To ensure this occurs, the Strategy identifies strategies and actions to reflect Council's primary responsibilities, such as planning controls and areas where Council can facilitate a productive business environment. The Strategy indicates that Council aims to promote the development of airport infrastructure at Tamworth Regional Airport as an airport that plays a significant role in the local economy, primarily for passenger transport. This Master Plan will assist Council to achieve this aim.

2.5 REGULATORY CONTEXT

The Civil Aviation Safety Authority (CASA) is the statutory authority that conducts the safety regulation of civil air operations in Australia including the regulation of certified and registered aerodromes. The CASA Manual of Standards Part 139 Aerodromes (CASA MOS Part 139) is made pursuant to Civil Aviation Safety Regulations (CASR) Part 139. CASR Part 139 sets out the regulatory regime for aerodromes used by aeroplanes conducting air transport operations.

CASA MOS Part 139 sets out the standards and operating procedures for certified, registered aerodromes and other aerodromes used in air transport operations. As a Certified Aerodrome under CASR Part 139, the existing facilities and any proposed future facilities included within this Airport Master Plan for Tamworth Regional Airport must comply with the standards set out in CASA MOS Part 139.

2.5.1 AVIATION SECURITY

The *Aviation Transport Security Act 2004* establishes a regulatory framework to safeguard against unlawful interference with aviation. To achieve this purpose, the Act establishes minimum security requirements for civil aviation in Australia by imposing obligations on airport operators. Existing and future facilities must comply with the *Aviation Transport Security Regulations 2005* made under the *Aviation Transport Security Act 2004*.

Tamworth Regional Airport is a Security Controlled aerodrome and the specific requirements for aviation security applicable at Tamworth are set out in the airport's Transport Security Program.

There is a requirement to implement screening of passengers and checked baggage where Regular Public Transport or open charter services are operated by aircraft with a maximum weight of more than 20,000kg. As QantasLink Q400, Virgin Australia's ATR72-600 and the Embraer ERJ 135 aircraft operated by JetGo each trigger this requirement, all Regular Public Transport services departing from Tamworth are subject to full passenger and checked baggage screening.

2.6 STAKEHOLDER CONSULTATION

2.6.1 STAKEHOLDER MEETINGS

Stakeholder consultation was undertaken to solicit the views, issues and concerns of key stakeholders and airport users including Council representatives, airport tenants and other users. Consultation was undertaken during a site visit to Tamworth by REHBEIN Airport Consulting personnel in January 2015 including separate meetings with Council representatives and individual stakeholders. Some consultation was undertaken separately by telephone and email over the period February – June 2015. Discussion was largely focussed on the future infrastructure requirements and expansion potential of Tamworth Regional Airport. The stakeholders consulted are indicated in **Table 1**.

Table 1: Stakeholder Consultation

Organisation	Representative Name	Position	Date
Tamworth Regional Council	Craig Dunstan	Manager Destination Tamworth	28 January 2015
	David Lewis	Major Development Approvals	27 January 2015
	Andrew Spicer	Manager Strategic Planning (A/g)	
	Meagan Purkiss	Strategic Planner	
	Jackie Kruger	Director Planning & Community Services	27 January 2015 25 June 2015
	Councillors		
Airservices	Anthony Read		27 January 2015 26 June 2015
BAE Systems	Pierre Steyn	Program Manager	28 January 2015 26 June 2015
QantasLink	Glen Reedy	Base Maintenance Manager	28 January 2015
	Alastair Prout	Chief Engineer	26 June 2015
Shell Northwest Aviation Fuels	Dave & Sharon Roberts		28 January 2015
Westpac Rescue Helicopter Service	Peter Alcock	Company Secretary	28 January 2015
Sigma Aerospace	Matthew Wheatley	Director	28 January 2015
	Geoff Jones	GM Engineering & Maintenance	
NSW Trade & Investment	Rob Harrison	Export Advisor, Investment & Export Services	28 January 2015
	Darren Keegan	Business Development Manager	26 June 2015
Eagle Eye Self Storage	Grahame Bourke	Proprietor	28 January 2015
Rural Fire Service	Allyn Purkiss	Manager Tamworth	27 January 2015
	Steve Prior	Operational Services	
Macquarie Pilots Centre	Darryl Gosper		27 January 2015
Dalabam Belmore Engineering	David Green	Business Owner	27 January 2015
Tamworth Aero Club	Adele Mazoudier		27 January 2015
Prospective Airport Tenants	Lisa & Todd Matsoo		28 January 2015
JetGo	Paul Bredereck	Managing Director Airlines	7 July 2015
Virgin Australia	Grahaem Duff (email)		7 July 2015

2.6.2 FEEDBACK SUMMARY

Feedback obtained during consultation included a range of concerns and issues and provided a valuable background to Tamworth Regional Airport’s existing situation and future aspirations. The key themes relevant to this study are as follows:

- Provision of grass cross runways is very handing for pilot training to allow landing on a different runway surface and direction;
- Public amenities accessible from airside for pilots is a requirement;

- Availability of all-weather external aircraft parking areas is limited;
- Council is working with a Chinese logistics company which harbours aspirations for direct fresh freight services;
- An area where charter aircraft could operate without being subject to screening requirements in the terminal would be highly advantageous. A number of closed charter operations undertake transfer of RFS firefighters and mine contractors, for whom screening is problematic due to the nature of tools, equipment and samples as well as explosive traces;
- Upgrade of Taxiway B to allow RPT aircraft to avoid backtracking to the Runway 12L threshold will be necessary if capacity increases are required due to growth in flying training activity;
- The closure of Runway 18/36, which is mainly utilised for taxiing, and conversion to a sealed taxiway would be operationally beneficial;
- The ability to provide lighting to Runway 12R/30L to enable night operations should be preserved. Currently night circuit operations can include 5-6 aircraft simultaneously and this becomes congested with other operations requiring the main runway;
- The instrument landing system on Runway 30R is approaching the end of its life and will need replacing if the facility is to be retained;
- Due to the shape of the military training circuits, which are closer to the runway on the downwind leg and incorporate continuous turns in a racetrack pattern rather than a straight crosswind and base leg, it is difficult to contain the helicopter training circuits within the fixed wing circuit. Future provision for helicopter operations needs careful consideration;
- Previous Master Plans have not been shared with airport users;
- Only one hangar has been added to the airport in the last seven years. Council needs to be considering how to attract new tenants and accommodate them to stimulate aviation activity;
- Development should not occur along the main highway due to access issues and lack of available space to the runway;
- Requirements for compass swing and engine run up facilities which address noise issues (through an acoustic shed or other appropriate facility);
- Roadway access to the terminal precinct for heavy vehicles, freight deliveries and pickups etc is an issue. Future development areas should make adequate provision;
- The Tamworth Aero Club has substantial heritage and can play a pivotal role in aviation development and promotion of the aviation industry in Tamworth, as well as serving an important tourism role. The club has a community focus providing facilities and a social hub for a wide variety of aviation users including the RFS, BAE students. A location adjacent to the airfield is desirable but could be sacrificed if necessary to maintain a facility which allows the club's community function to be retained;

- Access/egress from Basil Brown Drive onto New Winton Road can be dangerous at certain times of day due to glare from the sun, particularly in the afternoon. A link to the Oxley Highway to provide an alternative access route to New Winton Road could be considered;
- There is interest from several existing and prospective airport tenants for hangar lease sites of up to 60 x 40 metres in the next 2 – 5 years;
- A waiting area for off-airport transport providers to provide corporate pick up services without having to use the public parking areas would be beneficial;
- There is a lack of facilities for aeromedical aircraft operators, such as toilets and water. These could be incorporated with a patient transfer facility as this currently occurs on the apron exposed to the weather;
- There could be an opportunity for a motel facility to serve travelling professionals (specialist company representatives, medical professionals and police) which currently utilise the flying college accommodation, as well as passengers on future regional hub and spoke services. This could be integrated with aero club facilities.

3.0 EXISTING SITUATION

This chapter provides a brief description of the main infrastructure components and activities at Tamworth Regional Airport. The airport has 24-hour operations with no curfew. **Figure B at Appendix A** shows the existing airport facilities.

3.1 AERODROME FACILITIES

3.1.1 RUNWAYS

Tamworth Regional Airport has a four runway system with two parallel runways in the 12/30 direction and cross runways in the 06/24 and 18/36 directions. The existing runways are located in **Figure B**.

Runway 12L/30R

Runway 12L/30R is the main runway at Tamworth Regional Airport and is 45m wide and has a grooved bitumen asphalt surface with a total length of 2,200m. The runway is declared as a Code 4 runway and the runway width is adequate for aircraft up to Code E.

The runway strip associated with Runway 12L/30R is 150m wide with a graded surface. The runway strip does not meet the overall width requirements for a 45m wide runway as defined in CASA MOS Part 139, which requires 75m wide flyover areas either side of the graded strip to give a total width of 300m. It is noted that the location of the parallel taxiway system serving the runway would permit the full 300m runway strip width to be achieved, and Council is seeking to plan for the increased runway strip width.

Runway 12L/30R supports Code 4C, 4D and 4E aircraft operation in accordance with CASA MOS Part 139 requirements.

At 2,200m the runway is of sufficient length to support all current and most future operations, including those of up to Code E size, assuming these aircraft would be operating at relatively light weights (i.e. without passengers) such as might be the case for maintenance activity.

The published pavement classification number (PCN) is 19/F/C/780 (113 PSI) /T. The runway strength is suitable to accommodate typical 70-seat aircraft such as the Dash 8-Q400.

Runway End Safety Areas (RESAs) are in accordance with previous Australian standards whereby the length of the RESA is measured from the end of the Runway 12L/30R. The current standards require the RESA to be measured from the end of the runway strip. CASA permits existing RESAs to remain in accordance with the previous standard until the runway is lengthened, with the current CASA MOS Part 139 standard compliance.

Runway 12R/30L

Runway 12R/30L is 18m wide and has a total length of 1,110m. It is declared as a Code 1 runway and meets the minimum width requirements for Code B operations. This runway has a sealed surface capable of handling aircraft up to 5,700kg.

The graded runway strip width is 90m, which is suitable for non-precision approach operations to a Code 1 or 2 runway, although no runway aligned instrument approaches to this runway are currently published in IP-DAP.

The runway was designed for and is primarily utilised by CT/4B Airtrainer aircraft operated by BAE Systems flight training college.

Runways 06/24 and 18/36

Runways 06/24 and 18/36 are both 30m wide and are grassed brown clay. Both are located within 90m wide runway strips. The total length of Runway 18/36 is 1,020m and Runway 06/24 is 842m. These runways are declared as Code 1 runways even though they exceed the minimum runway and strip width requirements.

3.1.2 TAXIWAYS

There are several taxiways at Tamworth Regional Airport. The four-runway layout is equipped with a relatively complex network of taxiways to facilitate aircraft surface movement. The taxiway designations are located in **Figure B**.

Taxiways A, B and C

Runway 12L/30R is served by a parallel taxiway system on its southern side over approximately three-quarters of its length. The parallel taxiway (Taxiway B) is complemented with entry/exit taxiways (A and C) at suitable intersection locations with the runway.

The taxiway system between Taxiway C and the Runway 30R threshold is 15m wide with 3.5m sealed shoulders suitable for Code C jet aircraft operations. Taxiway B to the north-west of Taxiway C is restricted to 23m wingspan and limited to 8,000kg MTOW aircraft.

Taxiways A1 and A2 provide access from Taxiway B to the QantasLink apron and the GA apron

Taxiways D, E, H and G

The General Aviation area is primarily served by Taxiways D, E, G and H. Taxiways D and E are 10.5m wide to suit Code B aeroplanes. Taxiway G and H are 7.5m wide and only suitable for Code A use. Taxiway G1 links Taxiway D and Taxiway G.

Taxiways J, K, L, M and N

Runway 12R/30L is served by a full length parallel taxiway J and a partial section of dual parallel taxiway (Taxiway K), as well as entry/exit taxiways (L, M and N). These taxiways are all 7.5m wide (Code A). Taxiways J and K also connect the BAE Flying College apron area to Runway 12R/30L.

3.1.3 AIRCRAFT PARKING AREAS

RPT Apron

The main apron fronting the passenger terminal is used for RPT aircraft parking. The apron is sealed and is accessed via the Code C Taxiway A, or from Taxiway D for Code B aeroplanes.

Following a recent re-marking, the RPT apron can accommodate three independent aircraft positions catering for up to 2 x DHC8-400 and 1 x B737-800 or A320 (subject to the extension of taxiway fillets) in a free moving arrangement.

There is space for an extension of the RPT apron to the north and west.

Helicopter Parking

Three sealed helicopter parking positions are located to the west of the RPT apron, on the opposite side of Taxiway D.

Eastern GA Area

A separate sealed apron area providing access to the QantasLink maintenance operations in Hangar 1 and Hangar 2 is located immediately southeast of the RPT apron. A supplementary free-moving parking position is marked in front of Hangar 1.

Further to the southeast, free-moving apron parking positions are provided for four (4) Code B aeroplanes for use by freight and aeromedical operators and one (1) Code C position suitable for B737 aircraft.

Western GA Area

Additional apron/GA parking is provided between Taxiway D and Runway 18/36 in a combination of sealed and natural surface areas.

Three (3) sealed taxi-through parking positions for itinerant charter aircraft up to Code B are provided between Taxiway D and Taxiway G.

A marked light aircraft grassed tie-down area is located to the south of Taxiway G1. Further sealed and grassed tie-down parking for light aircraft is located between Taxiway G and Runway 18/36.

There are a number of sealed aircraft parking areas adjacent to hangar developments to west of the passenger terminal associated with Hangars 6, 7 and 8.

BAE Flying College

A large sealed apron is associated with the BAE flying college operation under BAE's airside lease.

3.1.4 AIR TRAFFIC CONTROL

Arrivals, departures, and circuit training at Tamworth are based on local procedures which make use of contra-rotating circuits to separate and regulate traffic flow. These are similar to those used at the major capital city secondary airports.

Tamworth Tower, operated by Airservices Australia, is situated approximately at the mid-point of the airfield and provides a comprehensive visual surveillance. The tower provides combined tower and approach control services within Class C and D airspace below 8,500 feet.

The tower hours are 0700 – 2015 Monday to Friday and 0800 – 1530 Weekends. Outside tower hours Tamworth Class C and D airspace becomes Class G.

3.1.5 VISUAL AND NAVAGATIONAL AIDS

Markers and markings

Standard white gable markers define the runway strips for both runways. Runway 12L/30R is provided with runway centreline, runway end, threshold, fixed distance, touchdown zone markings in accordance with CASA MOS Part 139. Taxi guideline markings are provided at taxiway entrances and turning nodes.

Wind indicators

The primary illuminated wind indicator (IWI) and associated signal area is illuminated and located to the north of Taxiway B adjacent Taxiway A1. This also acts as the IWI for the Runway 30R threshold.

A secondary IWI is provided approximately 100m upwind of the Runway 12L threshold.

Two further, non-illuminated wind indicators are also provided close to the Runway 12R threshold and between the Runway 30L and 36 thresholds.

Aerodrome Ground Lighting

Runway 12L/30R is equipped with medium intensity runway edge lighting and Precision Approach Path Indicator (PAPI) system (double-sided) to both runway ends.

Taxiways A, B, C and D are equipped with green taxiway centreline lighting.

Navigational Aids

The Tamworth non-directional beacon (NDB) on the airport is situated to the west of the Runway 12L/30R. The NDB is owned and operated by Airservices Australia. Its operation is planned to continue as the NDB is on Airservices' Backup Navaid Network (BNN).

The Tamworth Very High Frequency Omni Range and distance measuring equipment (VOR/DME) is situated to the north-west of Runway 12L/30R.

Both navigations aids are outside the current airport perimeter fence, but within Council-owned operational land. Airservices owns and maintains the NDB and VOR/DME.

In addition, Runway 30R is equipped with an Instrument Landing System (ILS) which is primarily used for training purposes. A high intensity approach lighting system (HIAL) array to supplement the ILS is not currently provided nor planned. Council owns and operates the instrument landing system (ILS) for Runway 30R. The four components of the ILS are the glide (GP) which is located to the north and upwind of the Runway 30R threshold, the localiser (LOC) sited on the extended

centreline of Runway 12L/30R at its western end, and two remote marker sites. Council contracts Airservices Australia to maintain the system.

Automatic Weather Information Service

A Bureau of Meteorology Automatic Weather Information Service (AWIS) is provided at Tamworth Regional Airport.

Satellite Ground Station

Airservices Australia also own and operate a satellite ground station (SGS) for air/ground communications, which is situated between Runway 18/36 and Taxiway D.

3.1.6 INSTRUMENT APPROACH PROCEDURES

Approaches to the aerodrome in the instrument meteorological condition (IMC) require the use of procedures based on the Runway 30R Instrument Landing System (ILS), the VOR/DME or NDB navigation aids, or on satellite-based technology.

Currently the following procedures are published for the airport:

- ILS OR LOC RWY 30R;
- VOR RWY 12L;
- VOR RWY 30R;
- NDB-A OR VOR-A;
- RNAV (GNSS) RWY 12L; and
- RNAV (GNSS) RWY 30R.

3.1.7 AIRCRAFT FUEL FACILITIES

Tamworth Regional Airport has both AVGAS and JET-A1 fuel facilities operated by Shell Aviation and Air BP.

The Shell fuel facility is located adjacent to the QantasLink maintenance hangars, to the south of the passenger terminal. Access for road tankers is via Basil Brown Drive.

A BP fuel storage facility is located at the southern end of the Western GA Area.

3.2 PASSENGER TERMINAL AND GROUND ACCESS

3.2.1 PASSENGER TERMINAL

The existing passenger terminal building is approximately 30m deep and 70m long in a curved arrangement. The terminal was last reconfigured in 2011 to accommodate full passenger and checked baggage screening requirements for RPT services on aircraft with a maximum weight of 20,000kg and above, a category which includes the Q400 aircraft operated by QantasLink, the ATR72-600 operated by Virgin Australia and the Embraer ERJ 135 aircraft operated by JetGo.

The terminal now incorporates a sterile departure lounge area with two (2) boarding gates and a Qantas Regional Lounge facility for the airline's premium passengers.

Council has conceptual plans to expand the terminal further to the east into the space currently occupied by the old control tower and airport management offices. This would provide adequate capacity to accommodate regular operations by regional jet and turboprop aircraft up to 70-80 seat capacity.

3.2.2 GROUND ACCESS

Ground transport access to the passenger terminal and GA areas is from Basil Brown Drive, which is a sealed two-lane road off New Winton Road. Basil Brown Drive passes between the residential and operational precincts of the BAE Systems flying college.

Access to the passenger terminal, main car park and hangar development is via the Shand Circuit, which is a sealed one way road circuit.

Access to the hangar development east of the passenger terminal is also via the Shand Circuit and then Packer Street and Rentell Street, which are both sealed roads.

The main car park has recently been expanded and provides approximately 220 parking spaces plus 2 disabled spaces. Within the car park some spaces are reserved for car rental companies, including Avis, Budget, Hertz and Thrifty.

Other non-public parking is provided for tenants on airport, including the QantasLink Administration, QantasLink maintenance facilities in Hangars 1 & 2, CASA office, BAE Systems Australia Flight Training Tamworth complex, the Australian-Pacific Aeronautical College facility and the Aero Club facility.

3.3 HANGAR DEVELOPMENT

Hangar development is located west and east of the RPT apron and passenger terminal area and is occupied by a variety of activities including private hangars, commercial aviation and aviation-related businesses. These businesses make extensive use of the Tamworth Regional Airport facilities. All facilities are on land leased from Council and in general the existing buildings are also owned by Council and leased to tenants.

3.3.1 EASTERN GA AREA

Immediately east of the passenger terminal, two large open-fronted hangars (Hangar 1 and Hangar 2) are owned by Council and occupied by QantasLink for a heavy maintenance base for Dash 8-Q400, Dash 8-300 and Dash 8-200 aircraft. The adjacent site to the east is reserved for Hangar 3, if this should be required in future, and currently occupied by car parking.

To the south-west of this is the Shell aviation fuel storage facility and beyond that, a site which is leased to the Westpac Rescue Helicopter Service.

3.3.2 WESTERN HANGAR AREA

A number of hangar facilities have been developed to the west of the passenger terminal. These include:

- A small building located immediately west of the terminal is used by Tamworth Aero Club – a licensed club and provides pilot training. The Aero Club also leases a hangar to the south, between Hangar s 8 and 9;
- Three hangars are occupied by commercial aviation activities, namely,
 - Snowgoose International (Hangar 6);
 - Sigma Aerospace (Hangar 7); and
 - The Macquarie Pilot Centre (Hangar 8); and
- A large hangar (Hangar 9) is used by AviSkills which provides practical, accredited and flexible training courses in aircraft mechanics and engineering.

3.3.3 BAE SYSTEMS AUSTRALIA FLIGHT TRAINING TAMWORTH

The BAE Systems Australia Flight Training Tamworth complex is a modern large-scale training and accommodation facility. Facilities include an integrated campus incorporating accommodation, education, training and maintenance facilities. The college is a leading world-class aviation academy and BAE Systems Australia has demonstrated flight training capability through involvement in the following Military training contracts:

- Basic flight training and flight screening for the Australian Defence Force (ADF);
- Air grading for the Republic of Singapore Air Force; and
- Flight training for Royal Malaysian Air Force, Royal Brunei Air Force and Papua New Guinea Defence Force pilots

This commercial pilot academy generates high-intensity flying operations with large volumes of touch-and-go circuits needing to be completed as efficiently as possible.

3.3.4 UTILITIES AND CIVIL INFRASTRUCTURE

Airport facilities require various utilities to meet operational capacity requirements. The utilities and civil infrastructure on airport are:

- Electricity reticulation and a substation;
- Closed Circuit Television (CCTV);
- Communications and network cabling;
- Sewer pipes and a pump station;
- Potable water supply; and
- Drainage.

3.4 HISTORICAL AVIATION ACTIVITY

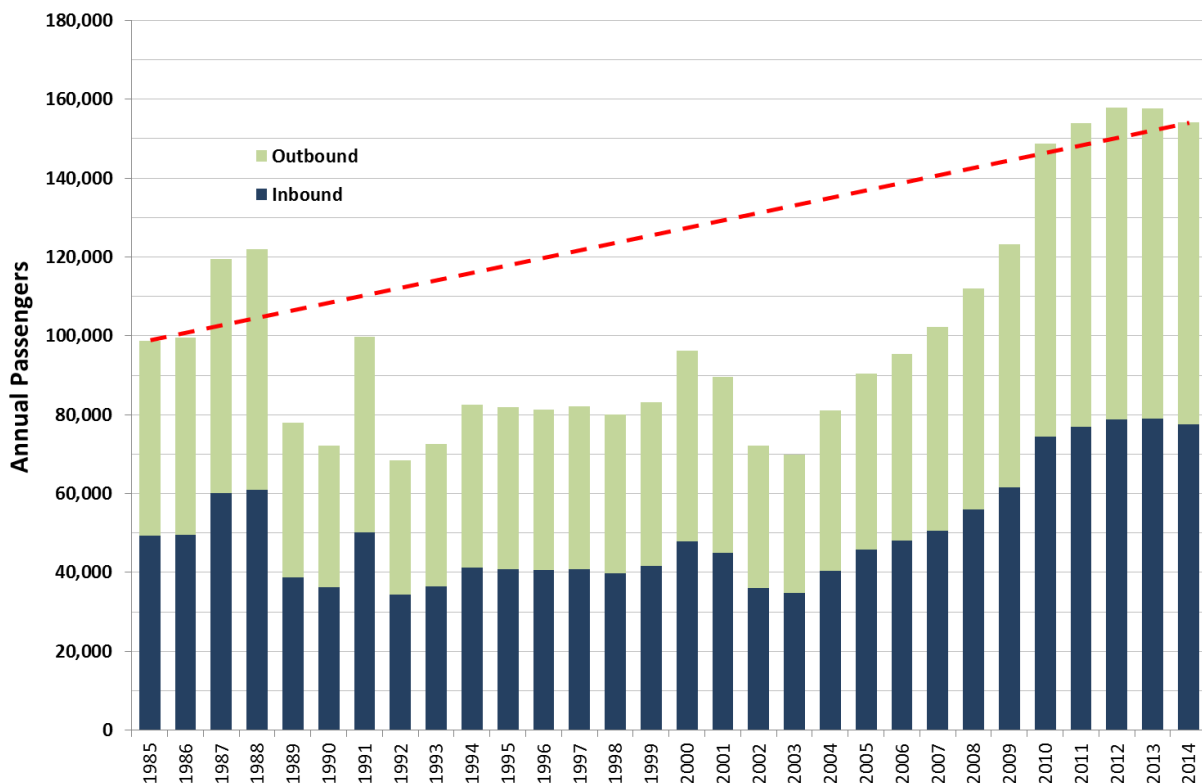
3.4.1 PASSENGER TRAFFIC

Figure 2 shows passenger numbers travelling on Regular Public Transport (RPT) services during the period from 1985 to 2014. Overall passenger numbers have been extremely volatile over the period, varying from less than 69,000 to more than 157,000.

Overall, there was an average growth rate of 1.5% from 1985 to 2014, although the period from 2003 to 2014 has seen traffic almost double with an annual average growth rate of 7.5%. Passenger numbers in 2014 totalled 154,100.

Virgin Australia and JetGo new RPT services commencing in 2015 will result in further passenger growth.

Figure 2: Historical Passenger Traffic 1985 - 2014



3.4.2 AIRCRAFT MOVEMENTS

Figure 3 displays total aircraft movements at Tamworth Airport from 2004 to 2014. This shows there has been a declining trend in aircraft movements over the past 10 years. The annual growth rate for this period is -3.1% for the total period.

Figure 4 shows aircraft movements by activity for the full 12 months during 2014. The aircraft movements comprise of RPT services, flight training and other GA activity (including private, charter freight and emergency services), military and helicopter movements.

Figure 3: Historical Aircraft movements 2004 - 2014

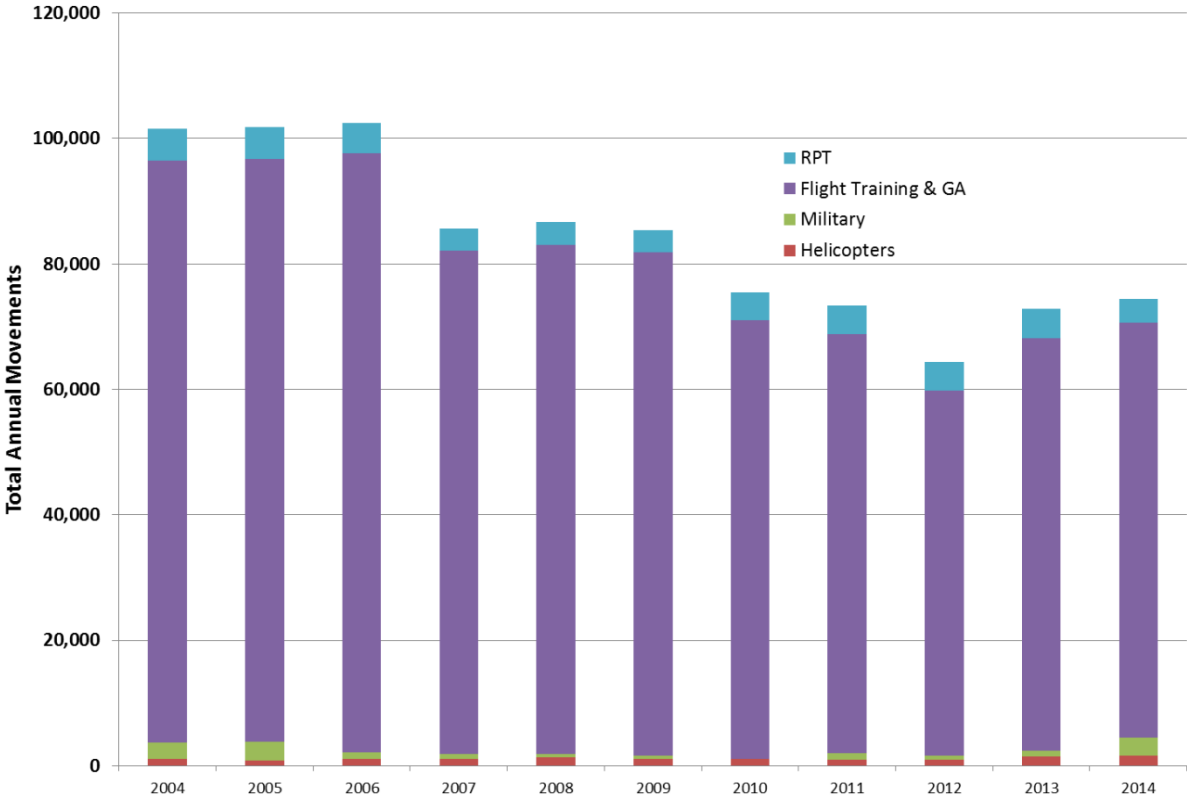
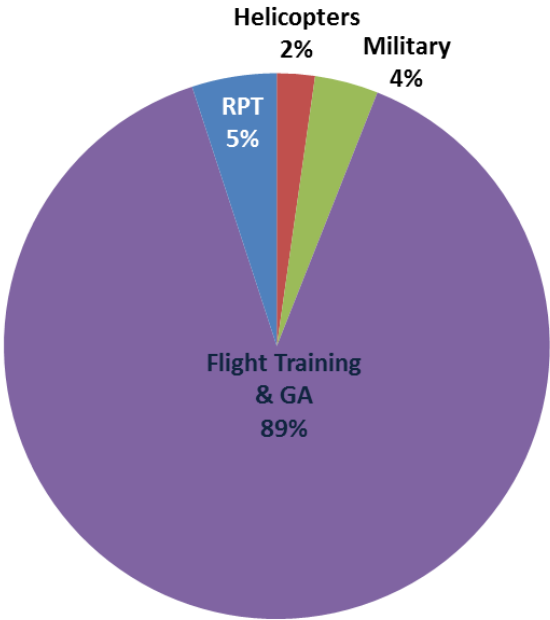


Figure 4: Aircraft Movements by Activity (2014)



4.0 FUTURE AVIATION ACTIVITY

4.1 DEVELOPMENT OPPORTUNITIES

To understand the possible opportunities for future aviation-related activities, feedback from the stakeholder consultation was combined with REHBEIN Airport Consulting's knowledge of key aviation industry trends and experience from a range of other regional airports, to understand existing and potential future economic and business opportunities for Tamworth Regional Airport.

Aviation and aviation-related opportunities were all considered with a view to facilitating the growth of the airport. The key opportunities identified through this process which the Master Plan aims to facilitate are:

- Additional RPT Airlines and Destinations;
- Regional Charter Operations;
- Flying Training: Fixed-wing and Rotary;
- Aircraft Maintenance, Repair & Overhaul (MRO); and
- Direct International Freight.

The following sub-sections highlight the opportunities considered most feasible, although of course others may exist now or in the future. These opportunities are then considered in estimating potential future aviation activity at the airport as well as in the land use planning to ensure aviation-related opportunities can be accommodated.

4.2 PASSENGER SERVICES

4.2.1 PASSENGER TRAFFIC

The future role of Tamworth Regional Airport is expected to continue to offer a high standard RPT service to the major centres of Sydney and Brisbane, and potentially other domestic and regional destinations. Key aviation opportunities for passenger services include additional RPT airlines and destinations, and additional regional charter operations.

Historical data presented in **Section 3.4** shows that passenger numbers at the airport have fluctuated considerably over the last 20 years, with an underlying compound annual average growth rate (CAGR) of 1.5% over that period.

The Tamworth Regional Local Government Area (LGA) had a population of 59,743 and is growing at a rate of 1.3% per annum (source: ABS, 2013). Taking into account the driving time to Sydney (and that from greater Sydney's main population centres to Tamworth), and the ABS forecast growth of the Tamworth Regional Local Government Area of 1.3% per annum, it is considered that 1.5% (CAGR) would represent a realistic low-growth case for passenger growth over the next 20 years even if local population growth exceeds expectations. The low-growth base scenario suggests annual passenger demand of approximately 214,000 passengers approximately by 2035.

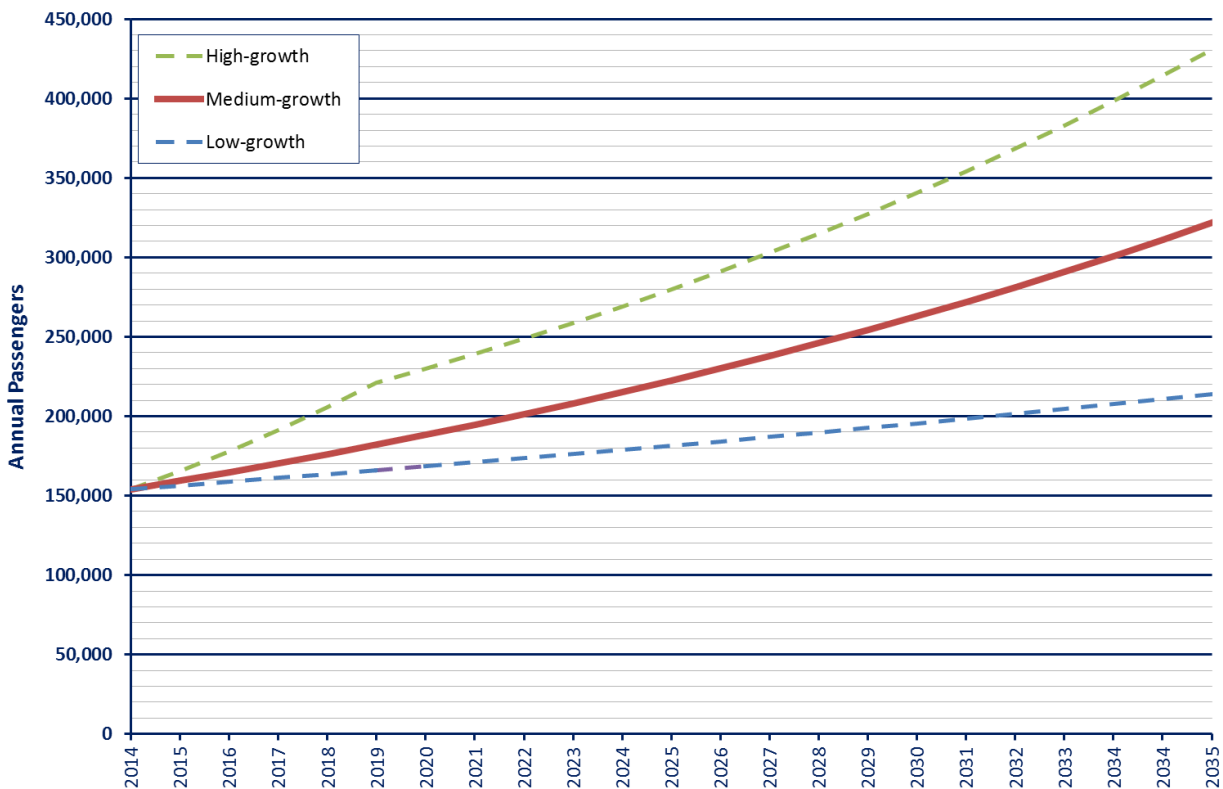
As a high-growth scenario, the more recent annual growth rate of 7.5% has been assumed to continue for the next 5 years, continuing the trend experienced since 2003. Increased competition as a result of the new RPT carriers can be expected to drive above-average growth at Tamworth over the next few years. The forecast annual growth rate is then revised to 4% from 2021 to 2035. This is consistent with the highest growth forecasts presently available for the Australian airport market, which is seen as maturing over the next 20 years. The high-growth scenario results in a passenger traffic level of around 430,000 passengers by 2035.

A medium-growth scenario with an annual growth rate of 3.4% suggests an annual passenger demand of approximately 320,000 passengers by 2035.

In the absence of other significant, but currently unforeseen, external drivers in the local economy, passenger traffic in 2035 is expected lie somewhere between the low growth rate of 214,000 passengers and an annual throughput of 430,000 annual passengers. The medium-growth level of 320,000 passengers is considered to represent a base case for airport facility planning purposes, whilst recognising that growth may always exceed this either in the short-term or over the planning period.

Figure 5 indicates forecast passenger numbers using the low-growth, medium-growth and high-growth rates per annum from 2014 to 2035.

Figure 5: Forecast Passenger Traffic 2014 – 2035



4.2.2 AIRCRAFT TYPES

Regular Public Transport

Passenger services are expected to continue to be operated using turboprop and regional jet types similar to those currently in operation. As traffic grows, a modest increase in the maximum size of aircraft in the fleet may occur. However as a regional port, service frequency will remain important. It is more likely that increased traffic will be served through the introduction of additional frequencies and destination than by significantly larger aircraft.

100-seat aircraft such as the F100, B717-200, E190 or similar might be expected on the Sydney route in the higher growth scenarios, with other destinations served by 30- to 70-seat aircraft.

Regional Charters and Fixed Base Operators

There is potential for an increased range of regional charter operations, due to the possibility that Tamworth is likely to increasingly act as a consolidation point for more remote, smaller regional communities which are unable to sustain their own RPT services. Charter operations carried out on a range of smaller aircraft types to feed the RPT services could form an important part of the aviation landscape in the future as availability of economic operating types below 50-seats becomes increasingly scarce. These operators would typically employ Code 2B aircraft types such as the Beech1900D, King Air, Cessna Caravan and Piper Chieftain.

Due to potential increase demand for regional aviation, fixed based operator (FBO) hangars may be required to provide additional servicing for itinerant private, corporate and charter aircraft. Catering more to business aircraft operators and high-end private aviators, in combination with the associated tourism draws, to generate more itinerant aircraft demand and the likely need for more FBOs over time.

4.3 FLIGHT TRAINING

Tamworth Regional Airport is recognised nationally and internationally for its commercial airline pilot training centre. Like many regional locations in Australia, Tamworth's location and airspace are conducive to *ab initio* pilot training. The infrastructure, facilities and services available at the airport will continue to support an increase in activity in this sector.

The BAE Systems Flight Training Australia Tamworth complex currently provides interim basic flying training for the Australian Defence Force under a contract which is likely to terminate at the end of 2019. Various actions are being pursued by BAE Systems and Tamworth Regional Council to ensure the continued used of the facility beyond this date for a more diverse range of contracts. These include military flying training contracts for other countries, as well as civilian flying training under a commercial pilot academy model.

The expectation therefore exists that ongoing flying training, both fixed wing and rotary will continue at Tamworth beyond 2020. However, a constraint to increasing capacity in flight training is the lack of immediate development sites, especially those with direct airside access.

4.4 AIRCRAFT MAINTENANCE, REPAIR AND OVERHAUL

Apart from its commercial flights, QantasLink also operates from the airport with a heavy maintenance base and two hangars. The workshops are primarily responsible for the heavy maintenance of the fleet's Dash 8-Q400 and Dash 8-Q300 aircraft.

Sigma Aerospace also provides maintenance, repair and overhaul (MRO) services for private, business and charter aircraft operators and there are synergies with the presence of AviSkills as a training organisation for aircraft maintenance engineers also based on the airport.

Provided that the inevitable challenges with respect to workforce availability and geographic accessibility associated with non-capital city locations, there are opportunities for the expansion of aircraft maintenance activity at Tamworth. This could include:

- Expansion of QantasLink maintenance operations to include a third line in addition to the current two;
- Expansion of QantasLink maintenance operations to include regional jet types (F100 and B717-200) within the carrier's fleet but which are currently maintained at other locations; and/or
- The establishment of other maintenance providers.

MRO activities on the airport could attract aircraft up to reference code 3C in size, and potentially larger, depending on the service provider(s) and respective markets.

Any increase in front-line MRO activity will also generate demand for supporting services such as avionics, aircraft interiors, and paint facilities.

4.5 DIRECT INTERNATIONAL FREIGHT

Several locations in regional Australia have put forward proposals to act as a regional freight hub for direct intercontinental services to Asia. As yet, the economics of direct international freight services to regional locations have prevented any of these progressing beyond the feasibility stage.

Nevertheless, provided a suitable two-way demand for freight can be established, the introduction of direct services on dedicated freighter aircraft which bypass congested capital city airports must not be ruled out. These would be especially valuable for high-value, perishable goods where the time expediency outweighs the inability to capitalise on economies of scale which the consolidated freight forwarding network can provide.

4.6 FORECAST AIRCRAFT MOVEMENTS

Projections of annual aircraft movement numbers have been developed by segmenting aviation activity into its principal component sectors, each of which has differing drivers and prospects for growth at Tamworth Regional Airport.

Potential long range aircraft movements by various aircraft types consistent with the growth opportunities described above have been estimated for the purpose of developing an Australian Noise Exposure Forecast (ANEF). These are summarised in **Table 1**.

Table 1: Long Range Aircraft Movement Forecasts

Aircraft Type	Projected Annual Movements	Growth Basis (over 50 years)
Boeing 747 Freighter	104	1 visit per week
Boeing 767-300F	312	3 visits per week
Embraer ERJ145	1,248	12 return services per week
Boeing 717-200	1,248	12 return services per week
Boeing 737-800	194	2.0%
Barron 58P	4,040	1.4%
C130 Hercules	258	2.0%
Bombardier Challenger 600	226	2.0%
Cessna 208	388	2.0%
Beech Kingair 350	2,229	2.0%
Dash 8	12,015	2.0%
Metro 23	646	2.0%
Piper Warrior PA28	2,261	2.0%
GA Fixed Prop	98,044	1.2%
GA Variable Prop	646	2.0%
Saab SF340	2,326	2.0%
Piper Warrior	6,880	4.8%
Subtotal Fixed Wing	133,064	
Bell206B-3	1,110	0.0%
Bell 430	592	2.0%
Eurocopter EC-130	592	2.0%
Blackhawk	2,153	2.0%
Squirrel	11,273	Assumes heli training starts by 2021 at levels 10% of fixed wing GASEPF then grows at 2% p.a. to same horizon as above.
Subtotal Rotary Wing	15,721	
TOTAL MOVEMENTS	148,785	

5.0 DEVELOPMENT CONCEPT

5.1 GENERAL PRINCIPLES

This section describes the overall development concept envisaged for Tamworth Regional Airport on the basis of its ultimate utilisation of available land. The concept presents what is considered to be the optimal strategic direction for the airport by identifying and determining the spatial allocation of land in a balanced manner.

Aeronautical infrastructure development and non-aeronautical development is described in the sections below. Although each is described separately, they are inherently linked as it is the aviation-related commercial development which will largely influence the requirements for aeronautical infrastructure.

The development concept described in this section is based on an assessment of the likely ultimate aviation needs of Tamworth Regional Airport. **Section 6.0** provides further discussion on logical indicative staging of the development, in accordance with demand.

5.2 AERONAUTICAL INFRASTRUCTURE

The proposed aeronautical development concept, covering airfield and terminal infrastructure requirements and development staging, has been prepared on the basis of satisfying a set of critical planning parameters. **Section 5.2.1** sets out the critical planning parameters upon which the aeronautical development proposals are based. This is followed by presentation of the proposals and development concepts for the runways, taxiways, aprons and passenger terminal.

Figure C, Figure D and Figure E set out the concepts described in this section in more detail.

5.2.1 DESIGN AIRCRAFT CHARACTERISTICS

CASA requires that aerodrome movement area infrastructure is designed to the standards applicable to the aircraft that the facilities are intended to serve. The relevant standards are set out in the CASA Manual of Standards Part 139 (MOS Part 139) and are based on an aerodrome reference code system established by the International Civil Aviation Organisation (ICAO), of which Australia is a signatory.

Aerodrome Reference Code

The dimensions, shape and layout of basic aerodrome facilities such as runways, taxiways and aprons are essentially determined by the performance capability and size of the aircraft that are intended to use them. The planning and design of these facilities therefore begins by identifying the most demanding or critical aircraft that will use them.

In Australia, like most countries, this is achieved by using the ICAO aerodrome reference code system. The reference code has two elements, a number and a letter, which are derived by grouping aircraft with similar performance capability and key physical dimensions. Thirteen aircraft

groupings, each with a unique code number and letter combination such as 1A, 2B, 3C, 4D and 4E have been identified.

The objective is to plan individual facilities for the critical aircraft likely to use them. Different facilities at the airport, such as those intended for RPT services and those intended solely for GA aircraft, are normally planned for their specific critical aircraft. On the other hand, common use facilities such as the primary runway and taxiway system will be planned for the most demanding aircraft envisaged to use the airport.

Pavement Strength

The strength of airfield pavements is classified using the ICAO Aircraft Classification Number/Pavement Classification Number (ACN/PCN) system. The ACN is calculated by the aircraft manufacturer for each aircraft, based on the damaging effect of the aircraft on different types of pavement. The ACN is dependent on both the maximum weight of the aircraft and the number, type and configuration of the landing gear. The ACN also includes a component related to the tyre pressure of the main gear, which can often become the critical parameter in relation to pavement strength.

Principal Aircraft Parameters

Table 2 summarises the principal relevant planning parameters that relate to aeronautical facilities for each of the key aircraft types that might conceivably use Tamworth Regional Airport in the future.

Table 2: Principal Design Aircraft Key Parameters

Aircraft Type	ICAO Aerodrome Reference Code	Wingspan (m)	MTOW (kg)	Typical Passenger Capacity (Pax)
Boeing 747-8F	4F	68.4	447,000	-
Boeing 747-400 Freighter	4E	64.9	396,893	-
Boeing 767-300 Freighter	4D	47.6	184,600	-
C130 Hercules	4D	40.4	70,460	-
Boeing 737-800W	4C	34.8	70,100	174
Boeing 717-200	4C	28.4	54,900	106
Embraer ERJ145	3B	20.0	22,000	50
Dash 8-Q400	3C	28.4	29,260	74
Metro 23	3C	17.4	7,480	19
Saab SF340	3C	21.4	13,155	34
Bombardier Challenger 600	2B	19.6	21,864	18
Cessna 208 Caravan	1B	15.9	3,310	9 - 12

Aircraft Type	ICAO Aerodrome Reference Code	Wingspan (m)	MTOW (kg)	Typical Passenger Capacity (Pax)
Beech Kingair 350	1B	17.7	66,804	9 - 15
GA Fixed Prop	1A	10.21	1,542	4
GA Variable Prop	1A	11,5	2,812	5
Barron 58P	1A	11.5	2,812	5
Piper Warrior PA28	1A	10.8	1,157	3

Master Plan Design Aircraft

At the forecast passenger traffic levels, the largest aircraft size requirement envisaged during the next 20 years is for 150 - 180 seat aircraft types. These are encompassed by a 4C aerodrome reference code.

From a commercial GA perspective, the vast majority of opportunities are likely to be covered by aircraft in the 2B or 3B categories. However, there are sufficient possibilities which would require Code C accessible facilities to ensure that these are provided for within certain areas of the airport. These areas include the main apron, taxiway connection to the Runway 30R threshold, and selected development sites within the Eastern, Western and Southern Precincts.

Freight, and in particular direct international freight, may require Code 4E or Code 4F aircraft such as the B747-400F, B777F or B747-8F.

5.2.2 RUNWAYS AND RUNWAY STRIPS

The aeronautical development concept incorporates the following ultimate facilities layout with respect to runways:

- Extension of existing Runway 12L/30R to give total length to 3,000m with provision made for a 300m extension to the South East and 540m extension to the North West. Pavement widening to 60m with 7.5m shoulders, strengthening as required, and OLS based on 300m wide runway strip and Code 4F Precision Instrument. Runway extension to this length would be subject to detailed assessment of the impacts of the VOR/DME and obstacle limitation surfaces as well as engineering and environmental feasibility (extending the runway 540m to the North West is likely to impact not only the VOR/DME but also the affect the Grassy Box Tree line which runs along the Bolton Creek area and which is an Environmental sensitive area);
- Extension of existing Runway 12R / 30L to give total length to 1,640m with provision made for a 530m extension to the North West, if required for pilot training activities. Pavement strengthening as required and widening to 23m total runway strip for OLS based on 90m wide runway strip and Code 2B Non-Precision Instrument;

- Runway 06 / 24 is retained with central section sealed west of RWY 18/36 for taxiway use by Code B aircraft. OLS based on 90m wide runway strip and Code 1 Non-Instrument; and
- Runway 18 / 36 is initially retained with central section 18m wide sealed south of Taxiway B for taxiway use by Code C aircraft. Ultimately, this runway would be converted to a taxiway to facilitate further development to the west of the terminal and redevelopment of the western GA area to accommodate larger charter aircraft.

The areas required by the RESA standards for the extended runways are shown on **Figure C**. Although **Figure C** shows the minimum RESA standard of 90m long, Council should consider the ICAO recommendation for runways longer than 1,800m, the RESA length should be 240m. Presently, CASA only mandates the additional runway length for international aerodromes serving passenger jet operations. ICAO has indicated that this recommendation may become mandatory in the future and that may prompt CASA to require the additional RESA length. It is recommended that Council review this requirement in future Master Plans and consider setting aside small areas of land required to implement the possible future RESA standards, in order to minimise any risk that the length of runway would need to be reduced. It is considered especially prudent to ensure the feasibility of implementing the longer RESA for Code E or F operations.

5.2.3 TAXIWAYS

Provision for a suitable taxiway system has been identified based on the ultimate development of the currently available land, whilst also facilitating potential connections to adjacent land which may be used for airport-related opportunities. The future taxiway layout is indicated on **Figure C**, with further detail on **Figure D**.

The long-term objective for taxiway development is to establish a parallel taxiway arrangement wherever sufficient land exists. By ensuring that backtracking operations on runways are minimised, capacity of the runway system will be maximised allowing the greatest number of aircraft movements to occur as efficiently as possible.

In addition to the parallel taxiways, additional taxiways and taxilanes are proposed as required to serve to hangar development.

Development of the taxiway system, including the parallel taxiway components, can occur incrementally as demand grows and operational requirements dictate. As an initial stage, taxiways can be formalised on the natural surface for use when environmental conditions permit. As demand grows, taxiway links can be progressively sealed for all-weather use and strengthened for larger aircraft.

Taxiway system development options confirmed as feasible are:

- Upgrade Taxiway B to Code C to North West of Taxiway C;
- Extension of Taxiway B to North West and South East to connect to extended runway thresholds, with capability to handle Code D/E/F aircraft between Taxiway B and the Runway 12L threshold;

- Extension of Taxiway J to North West if Runway 12R / 30L extended; and
- New taxiway connecting Taxiway E/H to Runway 18 threshold and continuing west to proposed engine run-up / compass swing bay.

5.2.4 PASSENGER TERMINAL

Council recently installed more check-in counters and more baggage processing facilities following the completion of modifications to allow the terminal to cater for increased passenger services. Subject to funding, Council proposes to complete the extension of the terminal facilities to the east into the area currently occupied by the old control tower and airport management offices.

The new facilities will provide for the needs of the three carriers at Tamworth Airport, being Qantaslink, JetGo and Virgin Australia and future airline services. The baggage processing facilities more than double the size and capacity of the previous model, providing more room for passengers to access their baggage.

The requirement for further expansion of the terminal beyond this is likely to be driven by a further increase in aircraft size to regular operations by 120-seat aircraft or larger. The exact timing of the introduction of such services is difficult to predict, but is not anticipated within the first 5 years of this Master Plan. The passenger terminal capacity and level of service should be kept under review with respect to the flight schedule and operating aircraft size, which are the main drivers of terminal space requirements at regional airports. In the meantime areas identified for future terminal expansion reserve are likely to be required for other operational functions such as ground servicing equipment (GSE) manoeuvring and storage.

5.2.5 RPT APRON AIRCRAFT PARKING AREAS

Provision for apron parking is made by apron expansion towards Taxiway D and concept parking layout to accommodate the following:

- 4 x Q400 / ATR72 / ERJ-145 Primary Bays;
- 1 primary bay capable of B717-200 or F100; and
- 1 secondary position capable of B737-800 in lieu of 2 primary bays.

5.2.6 OTHER FACILITIES

RFS Fire Base

The Master Plan proposes a fire based facility for use of the Rural Fire Service in the area between the control Tower, Taxiway B and Runway 18/36 and Runway 06/24.

Long-term aircraft parking

It is proposed to expand the existing long-term parking for non-operational aircraft area to the west of Runway 18/36 and south of Runway 06/24 to enable more aircraft parking.

Other facilities

The development concept for other facilities in the Master Plan proposes to:

- Locate an engine run-up and compass swing bay off Taxiway J;
- Retain the fuel storage in the current location; and
- Development of aeromedical patient transfer facilities and crew amenity between the fuel storage and Westpac helicopter base.

5.3 NON-AERONAUTICAL DEVELOPMENT

Airports with available land that is not required for future aeronautical infrastructure have the potential to generate diverse revenue streams and produce economic generators. Revenue raised through the use of this land can be used to pay for major investments and expenditure growth. The airport also has a wider economic benefit to the area. The airport and the businesses located there employ local people. Furthermore, airports also invest relatively large amounts to meet new requirements, maintain their infrastructure and expand capacity. These investments often comprise both local construction and equipment.

Council would like to continue to take advantage of the available land at the airport and surrounding Council owned land to develop aviation-related activities and businesses whilst not infringing on the aeronautical requirements of the airport.

In responding to the objectives of the Master Plan, as described in **Section 1.4**, the main features of the non-aeronautical development concept include provision for additional aircraft hangars. The term 'hangar' is a generic description encompassing those types of facilities requiring airside access and therefore by definition includes such things as aircraft maintenance facilities, flying training schools, charter and fixed-base operations which might address the aviation-related opportunities described in **Section 4.1**.

5.3.1 KEY DEVELOPMENT CONSTRAINTS

There are key constraints to development which it has been necessary to take explicit account of in the preparation of the development aeronautical and non-aeronautical concepts set out below. These are:

- The Tamworth NDB is on Airservices Backup Navigation Network and will therefore continue to be in service for the foreseeable future. Airport development in the vicinity of the NDB will need to be compliant with NDB siting guidelines including building height limitations, until such time as the NDB is decommissioned or it can be relocated to an alternative location. The current location of the NDB means it prevents any development within a 60m radius of the antenna¹⁰. This limits the extent of subdivision development that

¹⁰ CASA MOS Part 139 v1.12 November 2014 para 11.1.13.1 stipulates that a radius of 150m from the NDB antenna should be kept clear of buildings exceeding 2.5m in any dimension. However, this requirement is generally proven to be conservative based on development at other airports. Airservices siting criteria for NDB state that development proposals between 60m and 300m radius from the centre of the NDB antenna that exceed an elevation angle of 5° from ground level at the centre of the antenna require assessment. This effectively permits buildings up to 5.25m high at a 60m radius without assessment and larger buildings subject to assessment.

is possible within the Western Precinct. Development outside 60m may also need to be subjected to a technical assessment by Airservices;

- The protection of obstacle limitation surfaces applicable to a Code 4 instrument non-precision approach runway with 300m wide runway strip.
- The limited extent of land available within the existing airport land perimeter fence boundary outside the runway and runway strip areas;
- The area required by the RESA standards for the extended runways and ICAO recommendation for runways longer than 1800m, the RESA length should be 240m indicating that this recommendation may become mandatory in the future;
- Growing RPT operational requirements displacing neighbouring sites;
- The lack of immediate development sites, especially those with direct airside access; and
- The age of some facilities.

5.3.2 DEVELOPMENT PRECINCTS

Four (4) precincts are identified for progressive development, consisting of:

- Terminal Precinct;
- Eastern Precinct;
- Western Precinct; and
- Southern Precinct.

Land uses to be allocated to these development precincts are allocated on a 'highest and best use' principle. Refer to **Figures C, D and E** for proposed precinct development.

Terminal Precinct

Objectives

The Terminal Precinct objectives are:

- To ensure adequate provision for operations related to the provision of core scheduled passenger services and associated activities including amenity for passengers; and
- To continue to provide for existing users requiring direct airside access in the short- to medium-term.

Description

The Terminal Precinct development concept is presented in **Figure D**.

This precinct layout is largely based around existing infrastructure and incorporates the existing passenger terminal building and car park, along with future expansion reserve for both. The Terminal Precinct also includes reserves for airport operations, QantasLink maintenance operations and airport related businesses not requiring direct airside access.

Bulk fuel storage facilities will be retained and an aeromedical patient transfer facility is also identified.

In the long-term, redevelopment of the existing airside uses to the west and south of the terminal is envisaged, to create a regional aviation reserve with areas set aside for apron and hangar facilities to be used by regional charter operators, fixed base operators and associated line maintenance providers.

The expansion reserve for the passenger terminal building is adequate to enable a significant upgrade of the terminal, sufficient to handle larger charter operations or RPT services by up to 180-seat aircraft.

The car park expansion would accommodate an approximate additional 350 spaces as described in **Section 5.3.3**.

Prioritised uses:

- | | |
|--|---|
| Airport Operations Reserve | <ul style="list-style-type: none"> ▪ RPT Apron; ▪ Passenger Terminal Facilities; ▪ Freight Processing Facilities (to be transported on RPT services); ▪ High-capacity premium charter operators (compatible with Security Restricted Area requirements); and ▪ GSE storage |
| Regional Aviation Reserve | <ul style="list-style-type: none"> ▪ Charter, fixed base operators, other passenger air service providers associated maintenance requiring direct access to the aerodrome movement area and connectivity to RPT traffic and terminal precinct amenity. |
| QantasLink Maintenance Operations Reserve | <ul style="list-style-type: none"> ▪ QantasLink maintenance facilities, adjacent apron, car parking and other directly associated uses. |
| Airport Related Businesses | <ul style="list-style-type: none"> ▪ Car rental administration, storage, maintenance and wash facilities; ▪ Airline, airport or aviation business administration offices; ▪ Aero Club; ▪ Self-storage facilities for passenger use; and ▪ Service station. |

Eastern Precinct

Objectives

The Eastern Precinct is proposed to provide an area of new hangars to meet existing requests and demand for hangar space. The objectives for the Eastern Precinct are:

- To provide additional commercial airside lease sites for up to Code C aircraft in the short term; and
- Enable an alternative airport access road alignment.

Description

The Eastern Precinct development concept is presented in **Figure E**. Key development concept features are:

- Approximately 36 additional 20m x 40m hangar sites with apron reserve suitable for Code B aircraft, with taxiway extension to hangar sites;
- Approximately 8 additional 45m x 60m hangar sites with apron reserve suitable for Code C aircraft, with taxiway extension to hangar sites;
- Taxiway access to the main Runway 12L/30R;
- Re-acquisition of Baiada lands and also some adjacent private land to fulfil the precinct's potential. A partial development could occur with only the Baiada land; and
- An alternative airport access road by removing a small strip of BAE lease area to remove public access from the section of Basil Brown Drive flanked by BAE.

Prioritised uses:

- Westpac facilities (existing use);
- Commercial aeronautical operations including charter and maintenance operators;
- Possible helicopter base for BAE commercial helicopter flying training;
- Private aircraft hangars; and
- Aero Club facilities

Western Precinct

Objectives

The Western Precinct objective is to facilitate the development of facilities for larger aircraft in the medium term, including international freight processing and jet maintenance.

Description

The Western Precinct development concept is presented in **Figure C**. Key development concept features are:

- Additional Code D/E/F aircraft facilities, which could be used for direct international freight services, if required, at the north-western end of the site, including direct access of the Oxley Highway;

- Additional medium-to long-term development for Code C jet maintenance facilities and other Code C commercial operators;
- Further facilities for smaller Code A/B operators with convenient access to Runway 12R/30L, 18/36, as well as 12L/30R, if required;
- Taxiway access to Main Runway 12L/30R and taxiway access to Runway 12R/30L for Code A aircraft;
- Expansion of long-term parking for non-operational aircraft area west of Runway 18/36 to enable more aircraft parking;
- Providing a fire base facility for use of the Rural Fire Service in the area between the control Tower, Taxiway B and Runway 18/36 and Runway 06/24;
- Locating an engine run-up and compass swing bay off Taxiway J; and
- Using Runway 06 / 24 west of RWY 18/36 for taxiway use by Code B aircraft.

Prioritised uses:

- International freight processing facilities (Code D/E/F)
- Commercial aeronautical operations for jet aircraft including charter and maintenance operators Code C)
- Private aircraft hangarage (Code B/C)
- Light aircraft precinct (Code A)
- Aero Club

Southern Precinct

Objectives

The Southern Precinct objectives are:

- To provide facilities for private light aircraft users including aeronautical activities of the Tamworth Aero Club; and
- To provide an area for long-term development with uses to be determined according to demand.

Description

Key development concept features are:

- Providing for a mix of aeronautical and non-aeronautical uses, generally not anticipated in the short- to medium-term, but which nonetheless may be required eventually;
- Allowing flexibility to accommodate opportunities not adequately provided for in other precincts; and
- Providing an immediate opportunity for Aero Club relocation prior to development of other precincts being implemented.

Prioritised uses:

- Aero Club
- Private light aircraft precinct
- Non-aeronautical development

5.3.3 LANDSIDE ACCESS

External Access

A new external access is proposed from the Oxley Highway to provide direct access to the proposed aircraft facilities and potential international freight services in the Western Precinct. This access would need to remain clear of the protection surfaces associated with the VOR/DME to the north-west of the extended runway. To achieve this, the road access would potentially be via Duri-Wallmore Road. A possible alternative would be to construct a short tunnel beneath the RESA for the extended runway.

An alternative airport access to the Terminal Precinct and Eastern Precinct is proposed to remove public access from the section of Basil Brown Drive that is used by the BAE Systems Flight Training Australia complex. The road reserve width of 15m would provide a two trafficable lanes, footpath areas, limited parking service corridors and road reserve landscaping.

Internal Access

Internal precinct road reserves are proposed to provide internal access to hangar reserves in the Western Precinct, Terminal Precinct and Eastern Precinct. The internal road reserves are presented in **Figures C, D and E**.

Car parking

The area immediately south of the passenger terminal and existing car park is reserved for expansion of car parking requirements for the Terminal Precinct and nearby development. There is room for approximately 250 additional spaces.

Within the proposed precincts, it is envisaged that the general principle would be to require adequate parking to be provided as part of individual hangar developments, an indicative lot layout shown has been sized accordingly. Supplementary parking areas could however be provided in convenient locations.

5.3.4 ENGINEERING SERVICES

It is assumed that there is sufficient capacity in the existing supply systems (water, electricity, sewer and telecommunication) at the airport boundary to service the new development areas. It is recommended that the Council undertake an assessment of these services to confirm the adequacy of these engineering services. The precincts would take supply from junctions at appropriate locations along Basil Brown Drive.

It is recommended that a conceptual master grading design be undertaken for the proposed Western Precinct to prove the land use concept and determine the indicative extent of any required earthworks and drainage systems.

6.0 IMPLEMENTATION PLAN

6.1 DEVELOPMENT STAGING

For the purpose of this Master Plan, developments have been divided into three stages by expected timing, as follows:

- Short-term: Expected to be required within the next five years (i.e. before 2020). Planning and budgeting for these developments should occur now;
- Medium-term: Expected to be required sometime between 5 and 15 years (i.e. between 2020 and 2030). The timing of these developments is subject to a number of factors which make it difficult to predict the exact timeframe. The need and expected timing of these should be reviewed further during the next 5-yearly Master Plan review process, when it is anticipated that some of these developments will move into the ‘short-term’ category; and
- Long-term (or ultimate): developments which are to comply with sound planning practices should nevertheless continue to be safeguarded for implementation subject to demand, or for which there are existing constraints with unknown removal timeframes. These developments are not expected to occur before 2030, and may not occur within the 20-year timeframe of this Master Plan if at all.

Figure F provides the Indicative Development Staging for Tamworth Regional Airport. The main aspects and triggers for development are summarised in **Table 3**. The alphabetic order indicates the approximate intended development sequence within each stage and where relevant specific triggers are identified. No attempt has been made to anticipate the order of Stage 3 developments due to the distant timeframe within which these are envisaged.

Table 3: Key Development Items and Triggers

Item	Description	Trigger
1A	Expansion of RPT apron	Operational Need
1B	RFS Firebase Facilities	RFS requirement
1C	Upgrade of Taxiway B (NW of Taxiway C) to Code C capability	Operational Need
1D	Expansion of long-term aircraft parking area	Demand for off-line aircraft storage
1E	Code C taxiway access to Eastern Precinct Development and servicing of first phase of Eastern Precinct to provide 4 Code C and 18 Code A/B hangar lots with taxilane and road access Road connection to Eastern Precinct from Basil Brown Drive as first section of future airport access road alignment	Demand for additional hangar sites
1F	Aeromedical Patient Transfer Facilities	Subject to funding

Item	Description	Trigger
1G	Extension of Runway 12R/30L to total length of 1,640m & widening to 23m Extension of Taxiway J to suit Strengthening of Taxiways J, K, L, M	Major flying training contract
2A	Expansion of long-term Car Park to ~300 spaces	Demand
2B	Development of possible Aero Club aeronautical facilities and private light aircraft storage hangars in Southern Precinct	Relocation of Aero Club to allow terminal and operations area expansion across existing site
2C	Seal central 18m of Runway 18/36 for use as taxiway by Code C aircraft Upgrade part of Taxiway J for Code C aircraft Provide compass swing bay	Operational need to replace compass swing bay adjacent Taxiway B to maintain Code C clearance
2D	Expansion of BAE Flying College Facilities lease area	Tenant requirements
2E	Extension of Runway 12L/30R by 540m to NW Extension of Runway 12L/30R by 300m to SE Provision of Code E taxiway between Taxiway B and new Runway 12L threshold	International direct wide body freight operations
2F	Development of wide body facilities in Western Precinct	International direct wide body freight operations
2G	Development of Code C jet facilities in Western Precinct Provision of acoustic engine run facility in Western Precinct	Jet maintenance or increased turboprop maintenance
2H	Expansion of Eastern Precinct with additional 4 Code C and 18 Code A/B hangar lots with taxiway and road access	Demand for hangar sites prior to economic development of Western Precinct
2J	New Airport Access Road between Eastern Precinct and New Winton Road	Traffic flows exceed capacity of Basil Brown Drive to operate safely

6.2 INDICATIVE COSTS

Indicative costs have been developed for the key elements envisaged in the short term development have been prepared. Given there is considerable uncertainty over the need for, and required timing of, any of the other developments within the development concept, costs for medium and long-term developments are not appropriate at this stage. The indicative costs for short-term development items are summarised in **Table 4**.

Table 4: Indicative Costs for Key Short-Term Development Items

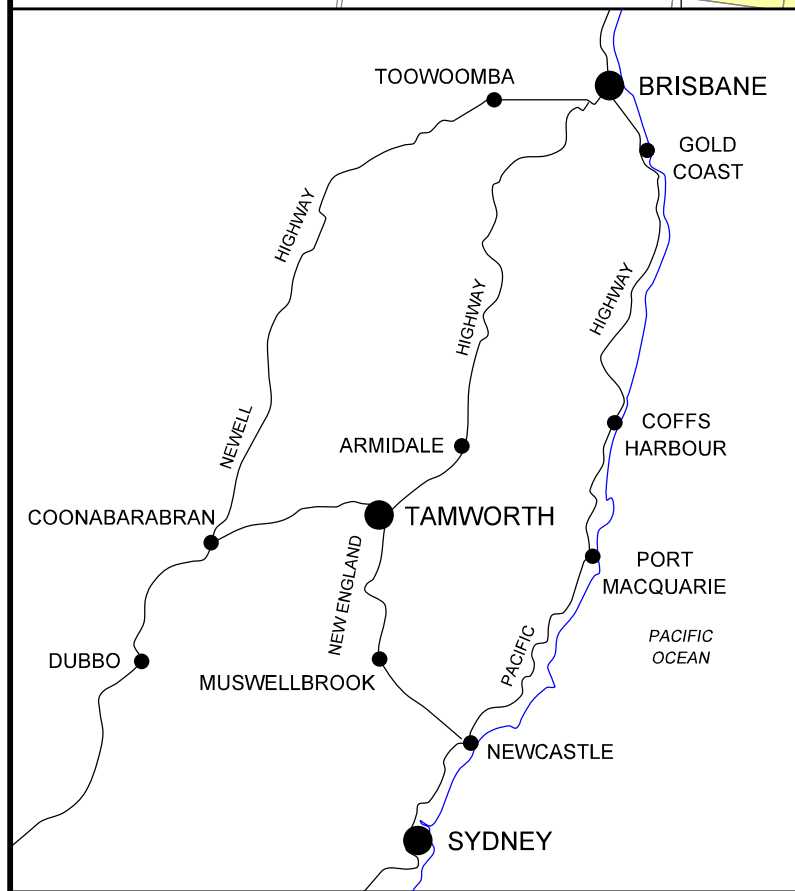
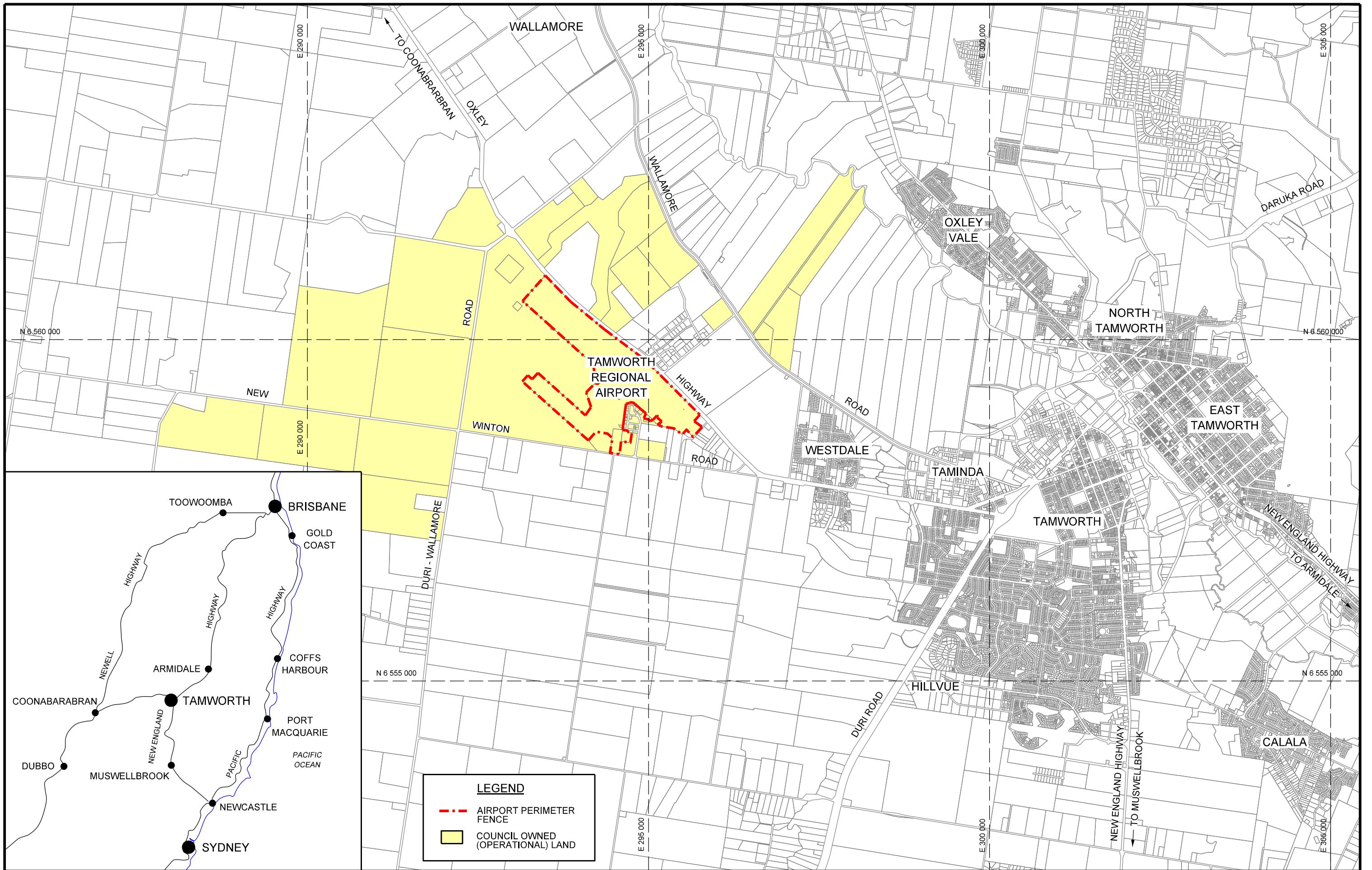
Item	Description	Indicative Cost	
1A	Expansion of RPT apron	\$3 million	
1B	RFS Firebase Facilities	by others	
1C	Upgrade of Taxiway B (NW of Taxiway C) to Code C capability	\$4 million	
1D	Expansion of long-term aircraft parking area	\$150,000	
1E	Airside works including Code C taxiway access to Eastern Precinct, Code B and C taxilane access within Stage 1	\$2.5 million	\$4.5 million
	Development and servicing of 4 Code C and 18 Code A/B hangar lots including road access from Basil Brown Drive	\$2.0 million	
1F	Aeromedical Patient Transfer Facilities	by others	
1G	Extension of Runway 12R/30L to total length of 1,640m and widening to 23m, Extension of Taxiway J to suit, Strengthening of Taxiways J, K, L, M	\$16 – 20 million	

A range of assumptions and exclusions were made in order to produce the indicative development costs, these are as follows:

- Costs are based on assumptions made in the absence of detailed feature and level survey and/or geotechnical investigation;
- Airfield development costs includes allowances for earthworks, pavement, stormwater drainage and airfield lighting;
- Costs included for the development of the precincts do not include ground improvements or servicing within the construction of hangars, it is anticipated that this will be carried out by the lessee/owners. Costs for engineering services (power, water, telecommunications, sewer and stormwater drainage) to the lot boundary, taxiway access (where relevant) and landside access to the subdivided sites have been considered only;
- Engineering services for the new subdivided sites will be connected to the existing services at the airport site;
- Upgrades to the power, water and sewer connections to the airport site have not been considered;
- GST has not been included;
- An allowance of 15% for preliminaries and 30% for design contingency has been made; and
- No allowance for construction contingency has been made.

APPENDIX A

MASTER PLAN FIGURES



LEGEND

- - - AIRPORT PERIMETER FENCE
- COUNCIL OWNED (OPERATIONAL) LAND

Project: TAMWORTH REGIONAL AIRPORT MASTER PLAN 2015

0.5 0 1.0 2.0Km

Client: TAMWORTH REGIONAL COUNCIL

Title: LOCALITY PLAN

REHBEIN Airport Consulting

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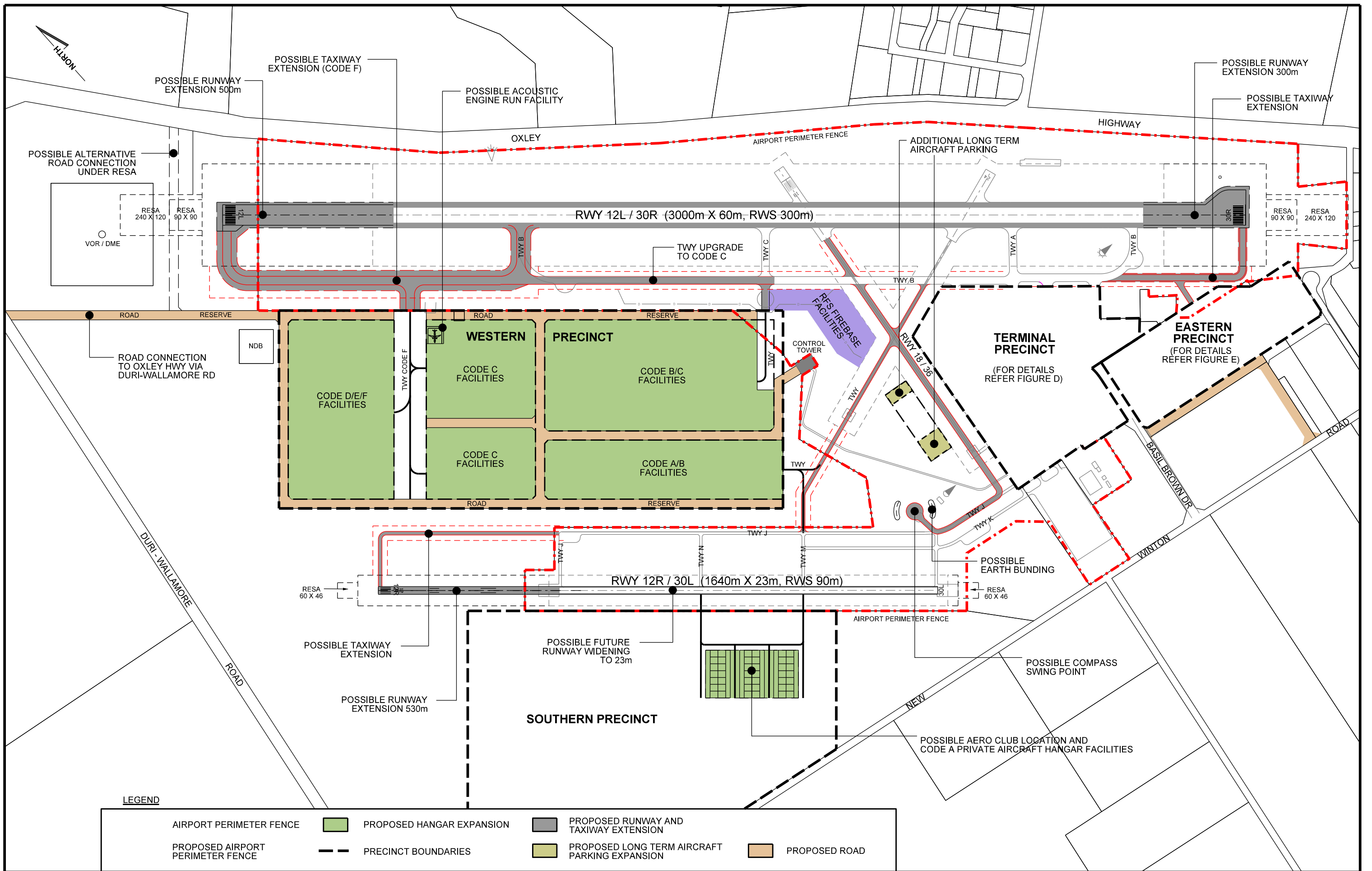
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Project: TAMWORTH REGIONAL AIRPORT MASTER PLAN 2015

Client: TAMWORTH REGIONAL COUNCIL
 Title: OVERALL SITE DEVELOPMENT CONCEPT

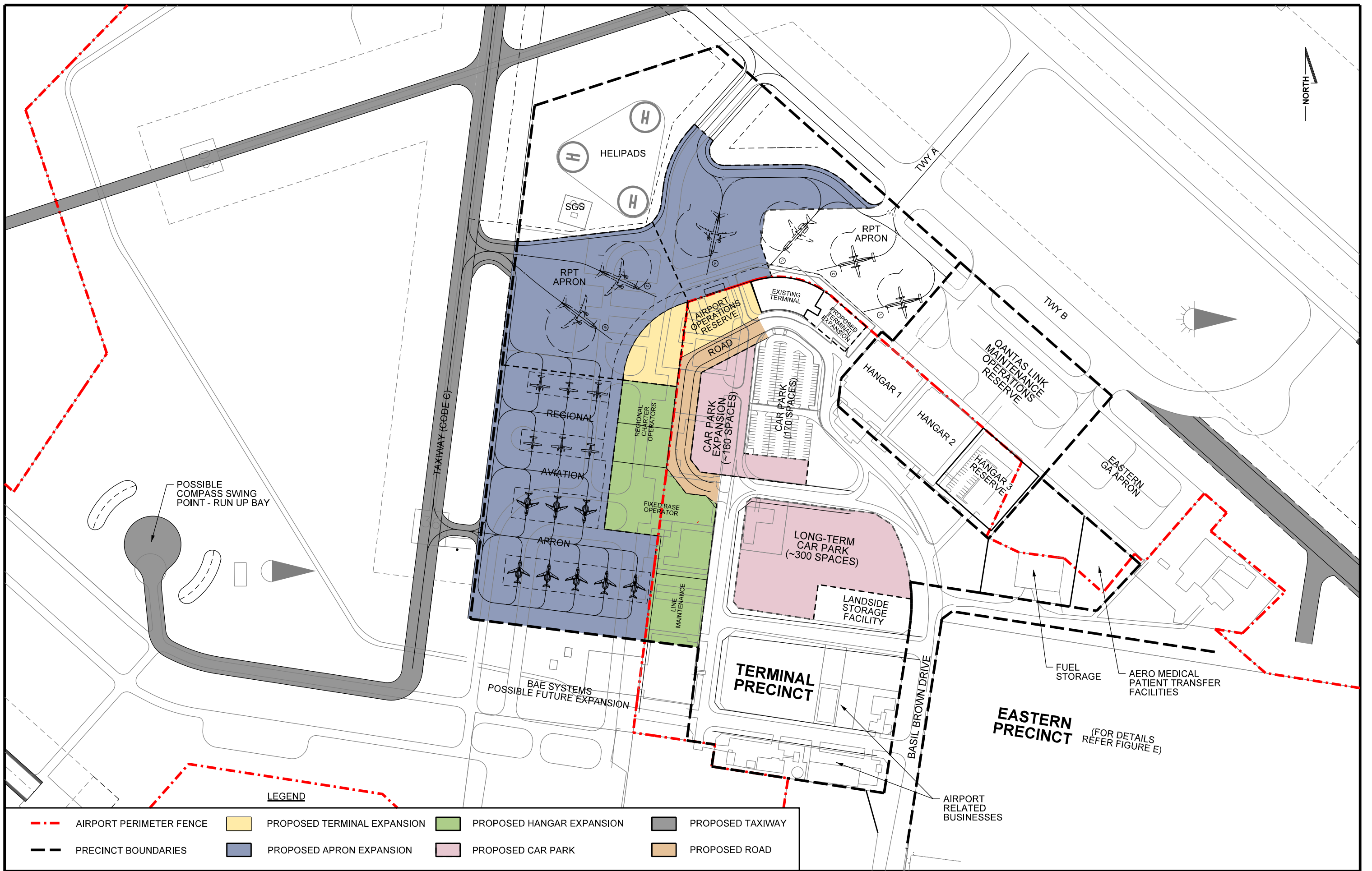
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Drawn: CMF Checked: BJH Approved: BJH



Project: **TAMWORTH REGIONAL AIRPORT MASTER PLAN 2015**

25 0 50 100m

Client: **TAMWORTH REGIONAL COUNCIL**

Title: **TERMINAL PRECINCT DEVELOPMENT CONCEPT**

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A C N 126 939 768
TELEPHONE (07) 3250 9000
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Drawn: CMF Checked: BJH Approved: BJH

Figure No:		FIGURE D	Scale: 1:3000	A3 Sheet Size
2	22 09 15			
1	31 07 15	File Ref: B13292		
0	15 07 15			
Rev.	Date			



TERMINAL PRECINCT
(FOR DETAILS REFER FIGURE D)

RESA
240 X 120



STAGE 1 STAGE 2

TAXILANE CODE B

EASTERN PRECINCT

PRECINCT

TAXILANE CODE C

TAXILANE CODE B

20M DEEP APRON RESERVE

20M DEEP APRON RESERVE

40M DEEP APRON RESERVE

40M DEEP APRON RESERVE

20M DEEP APRON RESERVE

20M DEEP APRON RESERVE

9 No 20 X 40m
HANGAR LOTS

9 No 20 X 40m
HANGAR LOTS

4 No 45 X 60m
HANGAR LOTS

4 No 45 X 60m
HANGAR LOTS

9 No 20 X 40m
HANGAR LOTS

9 No 20 X 40m
HANGAR LOTS

NEW AIRPORT

ENTRANCE ROAD

ALTERNATE NEW AIRPORT ENTRANCE ROAD ALIGNMENT

BAE SYSTEMS

BAE SYSTEMS

GATE
BASIL BROWN DR

NEW

WINTON

ROAD

LEGEND

AIRPORT PERIMETER FENCE	PROPOSED HANGAR EXPANSION	PROPOSED TAXIWAY
PRECINCT BOUNDARIES	PROPOSED ROAD	

Project: TAMWORTH REGIONAL AIRPORT
MASTER PLAN 2015

Client: TAMWORTH REGIONAL COUNCIL
Title: EASTERN PRECINCT DEVELOPMENT CONCEPT

REHBEIN Airport Consulting
The Association of Consulting Engineers Australia

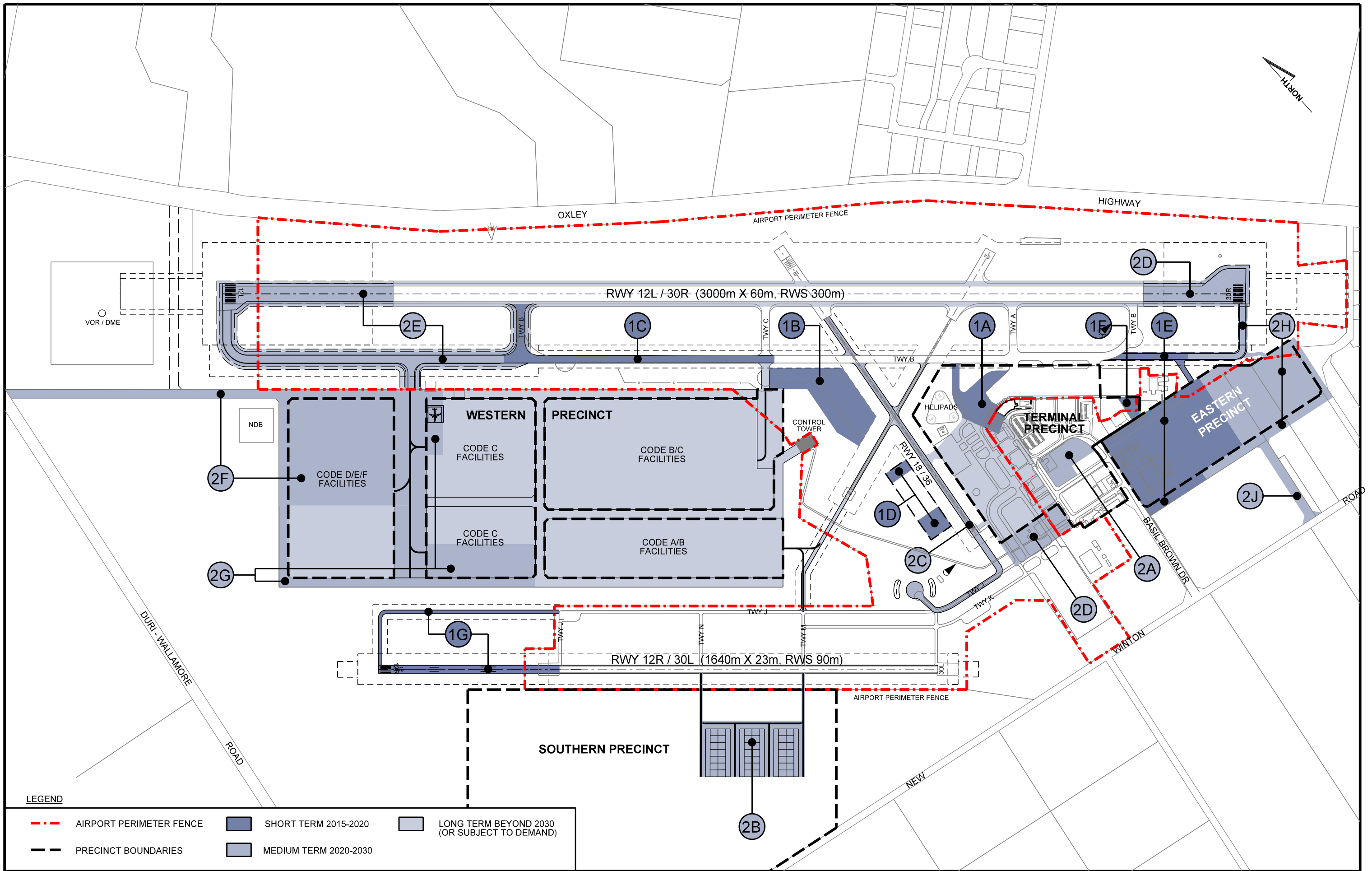
CBD HOUSE, Level 3
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3	23 03 17
2	22 09 15
1	31 07 15
0	15 07 15
Rev	Date

Figure No:
FIGURE E
Scale 1:2500
File Ref: B13292

A3
Sheet Size

Drawn: CMF Checked: BJH Approved: BJH



LEGEND

- - - AIRPORT PERIMETER FENCE
- PRECINCT BOUNDARIES
- SHORT TERM 2015-2020
- MEDIUM TERM 2020-2030
- LONG TERM BEYOND 2030 (OR SUBJECT TO DEMAND)

Project: TAMWORTH REGIONAL AIRPORT MASTER PLAN 2015

Client: TAMWORTH REGIONAL COUNCIL

Title: INDICATIVE DEVELOPMENT STAGING

10 0 20 40m

REHBEIN Airport Consulting

The Association of Consulting Engineers Australia

Drawn: CMF Checked: BJH Approved: BJH

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2	27 03 17
1	22 09 15
0	05 08 15
Rev	Date

Figure No: FIGURE F

Scale 1:10000

File Ref: B13292

A3
Sheet Size