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2022 Land Use Plan

Ballina Byron Gateway Airport

Prepared for

Ballina Shire Council

Client representative

Julie Stewart – Airport Manager

Date

22 March 2023

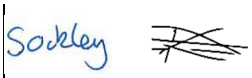
Rev 02

Table of Contents

List of figures

List of tables

Appendices

Prepared by — Simon Oakley/Kieran Donovan		**Date — 20.03.23**
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01	(Preliminary) Final 2022 Land Use Plan	S.Oakley/ K.Donovan et al	Lisa Trin	Tara Kooloos	23.01.23
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Title page images: BBGA 06/24 Runway Overlay (2013), BSC website and pitt&sherry images.

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This 2022 Land Use Plan (LUP) is general in nature and has been prepared for the benefit of BSC. The LUP includes information based on the BSC current expectations about future development of Ballina Byron Gateway Airport (BBGA). However, these expectations are predictive only and the development of Ballina Byron Gateway Airport may vary from the details of the LUP.

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Glossary of terms and abbreviations

The following glossary has been provided to facilitate the reading and understanding of this 2022 Land Use Plan.

AC	Advisory Circular
ACP	Airspace Change Proposal
ADRM	IATA Airport Development Reference Manual
ADS-B	Automatic Dependent Surveillance-Broadcast
AGL	Aeronautical Ground Lighting
AIP	Aeronautical Information Publication
ARC	Aerodrome Reference Code
ARFFS	Aviation Rescue and Fire Fighting Service
ARFL	Aeroplane Reference Field Length
ARFU	Aerodrome Frequency Response Unit
AsA	Airservices Australia
ATI	Aerodrome Technical Inspection
ATSA	Aviation Transport Security Act
ATSR	Aviation Transport Security Regulations
AVGAS	Aviation Gasoline
AWIS	Aerodrome Weather Information Service
BBGA	Ballina Byron Gateway Airport
BITRE	Bureau of Infrastructure and Transport Research Economics
BoM	Bureau of Meteorology
BSC	Ballina Shire Council
CAAP	Civil Aviation Advisory Publication
CAGRS	Certified Air Ground Radio System
CAO	Civil Aviation Order
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulation
CBR	California Bearing Ratio
CBS	Checked Bag Screening
CISC	Cyber and Infrastructure Security Centre
CTAF	Common Traffic Advisory Frequency
DAP	Departure and Approach Procedures
EDS	Explosive Detection System
ERSA	En Route Supplement Australia
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
GA	General Aviation (*GA operations include non-scheduled airlines, charter, private flying, pilot training, aircraft testing, ferrying and aerial work).*
GNSS	Global Navigation Satellite System
GPU	Ground Power Unit
GSE	Ground Support Equipment

HLS	Helicopter Landing Site
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IPR	Integrated Planning and Reporting (Framework)
ISA	International Standard Atmosphere (i.e. the temperature is 15°C)
IWDI	Illuminated Wind Direction Indicator
LCC	Low-Cost Carrier
LoS	Level of Service
LUP	Land Use Plan
MLW	Maximum Landing Weight
MTOW	Maximum Take-Off Weight
NASF	National Airports Safeguarding Framework
NAVAID	Navigational Aid
NBD	Non-Directional Beacon
NBN	National Broadband Network
OAR	Office of Airspace Regulation
OLS	Obstacle Limitation Surface
OMGWS	Outer Main Gear Wheel Span
OOG	Out Of Gauge
PALC	Pilot-Activated Lighting Control
PAPI	Precision Approach Path Indicator
Part 139 (Aerodromes) MOS 2019	Part 139 (Aerodromes) Manual of Standards 2019
PCN	Pavement Classification Number
PRD	Prohibited, Restricted and Danger
RDS	Runway Distance Supplement
RESA	Runway End Safety Area
RFDS	Royal Flying Doctor Service
RPT	Regular Public Transport
RTIL	Runway Threshold Identification Lights
SDS	Safety Data Sheets
TAF	Terminal Aerodrome Forecast
TBD	To Be Determined
TIFP	Terminal Instrument Flight Procedures
TRA	Tourism Research Australia
TSP	Transport Security Program
T-VASIS	T-Visual Approach Slope Indicator System
ULCC	Ultra-Low-Cost Carrier
VSS	Visual Segment Surface

Introduction

The aviation industry is highly competitive and requires responses to new challenges, including evolving passenger behaviour, technological developments, environmental challenges, and ever-changing energy costs. Airports are not immune to this pressure. In order to compete for traffic, airports must offer excellent facilities while providing a good return on investment.

Ballina Byron Gateway Airport (BBGA) is owned and operated by Ballina Shire Council (BSC). As such, BBGA is not subject to the statutory planning framework that requires the preparation of an Airport Master Plan as detailed in the Airports Act.

The BBGA annual passenger numbers are forecasted to grow from a base of 534,000 in FY2018/19 to more than 748,000 by FY2041/42. This reflects a nearly 40% increase in total, at an average annual growth rate of approximately 1.5% over the next 20-year period. As the demand for air travel grows, the airport terminal and its surrounds will continue to facilitate access to key destinations in the greater Northern Rivers area, including multi-faceted tourism, retail, and leisure.

BSC wishes to be in a position to manage and develop its airport infrastructure in a manner commensurate with this expected growth over the next 20 years. This objective can be fulfilled by assessing the needs for the airport infrastructure, planning for the future, and maintaining optimum flexibility to accommodate for future changes in response to the dynamic aviation industry in a way that is compatible with the environment and the local community. The 2022 BBGA Land Use Plan (LUP) (the “2022 LUP”) will enable logical development that will ensure the long-term ability of the airport to serve the Northern Rivers region and the community.

The objective for the 2022 LUP is to provide BSC with a 20-year rational development strategy for BBGA that maximises the current airport site, and provides a realistic representation of the airport site in the future. This includes a staged capital works strategy that considers general aviation opportunities, current and future demand for supporting infrastructure, and business development opportunities.

As part of the process to inform the development of the 2022 LUP, the following activities were undertaken:

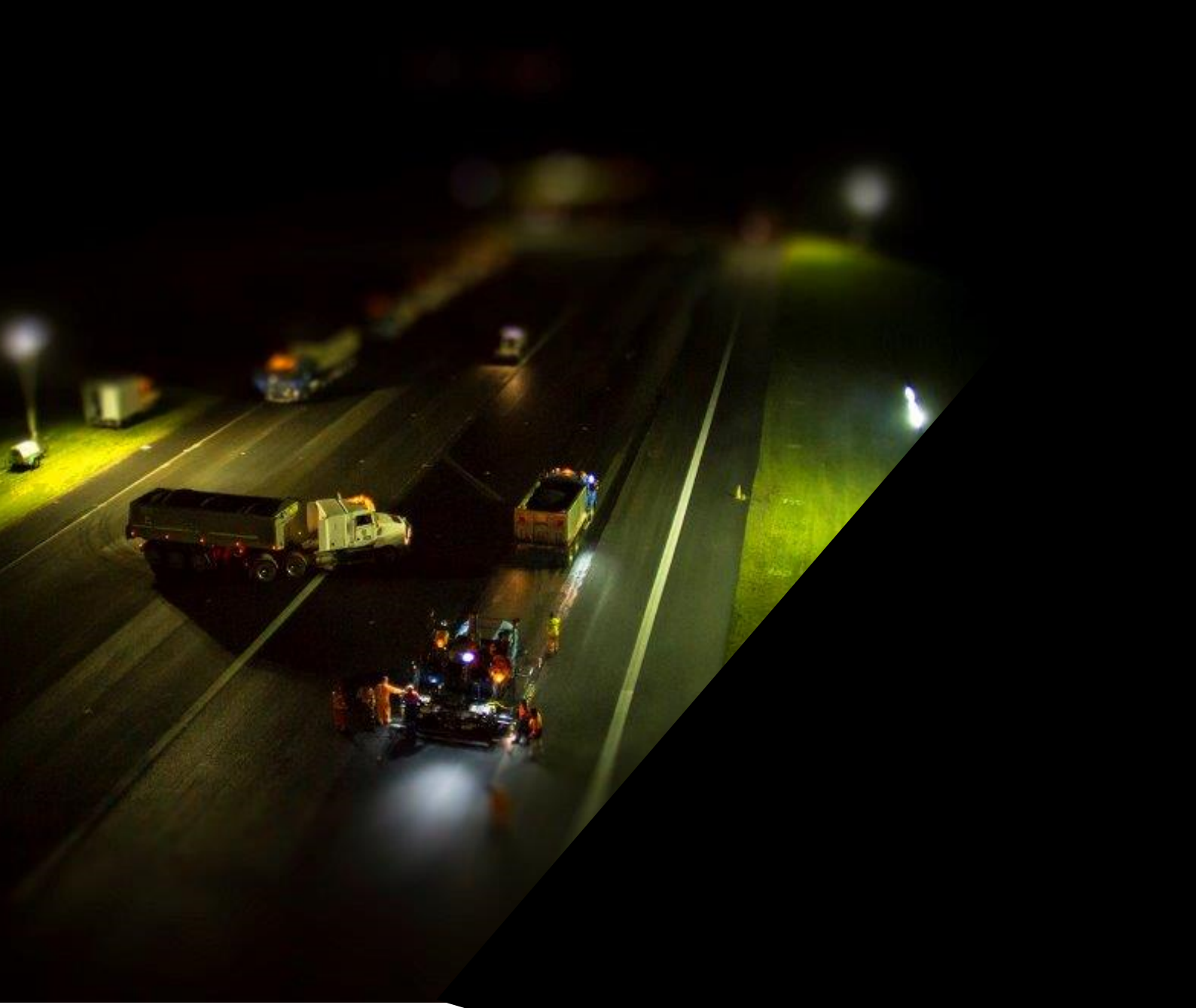
- Consultation and engagement with key local and BSC stakeholders, Airline Operators, tenants and service providers
- An assessment of the existing airport facilities and infrastructure
- Identification of airport infrastructure development constraints (including ground transport, land use, environmental, and airspace constraints)
- General review of trends and new potential developments in the aviation and associated industries, as well as the anticipated impacts on BBGA over the next 5 to 20 years
- Assessment of demand on existing airport infrastructure resulting from the anticipated forecast demands
- Identification of effects of local and regional development within the airport catchment; and
- Identification of effects of local development surrounding the airport on the operation and expansion of the airport.

The above information was then used to inform the anticipated future land use and development for BBGA. The planning process is contained within the 2022 LUP, including:

- Conceptual designs for the potential future land use and developments (both airside and landside, including airside movement areas, General Aviation (GA) facilities, terminal facilities and ground transport facilities); and
- Overall staged airside and landside conceptual development plans (with indicative budget capital cost estimates).

The 2022 LUP documents the perceived development of the airport, from its present configuration to its ultimate optimum configuration over the planning period, and makes this information available to all stakeholders and interested parties. The 2022 LUP, in essence, can be viewed as a site reservation plan and a management tool to assist in the planning and development of facilities in a rational, logical and economical manner without compromising existing operations. The integration of airport-wide planning has the potential to minimise capital spend, whilst maximising return on investment for BSC in future stages of development.

In general, the 2022 LUP is a living document that should be regularly reviewed.



1. Background

Ballina Shire Council (BSC) owns and operates Ballina Byron Gateway Airport (BBGA). BSC has held an Aerodrome Licence since 1986. Since that time, a number of upgrades have occurred; including the construction of the Terminal Building, the establishment of radio navigation aids, construction of pavement upgrades including the 06/24 Runway, construction of the Aeronautical Ground Lighting (AGL) system, Terminal Building extensions, and development of the landside areas.

BBGA is a major regional airport providing important air transport links to capital city airports. BBGA supports Regular Public Transport (RPT) services, air charter operations, General Aviation (GA), Emergency Response Services (including the Air Ambulance) and the Royal Flying Doctor Service (RFDS), as well as GA aircraft maintenance. Current RPT services are operated by Qantas, Jetstar, Virgin Australia, and FlyPelican, with approximately 407,277 annual passengers in 2020[1], and 528,684 annual passengers in 2021[2].

BBGA currently receives B737 and A320 aircraft operated by Virgin and Jetstar, respectively. Virgin Australia operates return flights to cater to the Ballina/Sydney route, whilst Jetstar operates return flights to cater to the Ballina/Sydney and Ballina/Melbourne routes.

Qantas currently operate return flights with DHC8-400 aircraft to cater for the Ballina/Sydney route, while FlyPelican currently operates return flights with BAe Jetstream 32 aircraft to cater for the Ballina/Newcastle route.

BBGA is located 3.5 km south of the Ballina town centre and serves the greater Northern River region. The airport has one primary runway designated as 06/24 Runway, which is sealed and is classified as a Code 3 instrument non-precision approach runway. The 06/24 Runway is 1,900 m long and 30 m wide, and has an asphalt surface that is suitable for both propeller and jet-engine aircraft.

The RPT Apron consists of four primary parking positions (numbered Bays 1 to 4) suitable for the aircraft currently operating from the airport, which ranges from SAAB 340 and BAe Jetstream 32, to B737 and A320 aircraft. There is also a proposed additional primary parking position (Bay 5) which will be suitable for aircraft up to A321 sized aircraft (under operational dispensation and pavement concession, which is based on the strength of the existing 06/24 Runway).

Economic activity is expected to increase air transport demand for RPT, air freight, and GA services. The demand for on-airport land and by non-aviation companies and organisations that may require access to air transport is also expected to rise.

BSC wishes to be in a position to manage and develop its airport infrastructure in a manner commensurate with the expected growth of the aviation industry over the next 20 years. This objective can be fulfilled by assessing the needs for the airport infrastructure, planning for the future, and maintaining optimum flexibility to accommodate future changes in response to the dynamic aviation industry in a way that is compatible with the environment and the local community. The 2022 LUP will enable logical development that will ensure the long-term ability of the airport to serve the Northern Rivers region and the community.

1.1 Brief history of the airport

The Ballina Aero Club was formed in 1928, with the airfield located parallel to Owen Street in Ballina. The airfield was given a B Class grading in 1931, which entitled BSC to charge for its use.

In 1981, BSC acquired a green-field site north of the Ballina township and commenced constructing a new runway in February 1986. Ballina Airport facilitated its first Regular Public Transport (RPT) flight on 25 October 1986.

Stage one works were completed in early 1987 and included a runway (1,660 m long and 30 m wide), car park, access roads, and a Terminal (relocatable structure).

[1] Bureau of Infrastructure and Transport Research Economics (BITRE) - Airport Traffic Data. November 2022. (https://www.bitre.gov.au)
[2] Bureau of Infrastructure and Transport Research Economics (BITRE) - Airport Traffic Data. November 2022. (https://www.bitre.gov.au)

The runway was extended to 1,900 m long in 1989 to cater for Fokker F28 aircraft operations.

In 2005, Ballina Airport was renamed Ballina Byron Gateway Airport.

1.2 2012 Land Use Plan

The 2012 LUP was developed by Gateway Project Partners and published in June 2012 with three primary objectives:

1. Provide a plan for future development at, or in the vicinity of the BBGA (i.e. the airport precinct) which meets the requirements of the existing and future airport users within the town plan zoning intents
2. Encourage development within the airport precinct to improve the economic return; and
3. Protect the BBGA and operations from incompatible development and activities in the surrounding area.

The general principles that guided the development of the 2012 LUP were:

- The establishment of new road linkages will be a critical step in the future development of the airport precinct
- Stage 1 development will be the realignment of the car parking area and establishment of the car rental holding bays on the new road linkage to the adjoining Southern Cross Estate
- Stage 2 development will be the redevelopment of the Terminal building entrance
- Stage 3 development will be the refurbishment and extension of the Terminal building; and
- Stage 4 developments will be the proposed extension and redevelopment of the General Aviation (GA) area (subsequent to the mandatory standards and guidelines).

At the time of publication of the 2012 LUP, a re-zoning application had been submitted, and was intended to provide BBGA with dedicated zoning of Special Purpose 2 (SP2) – Aerodrome. However, as this zoning had a minimum lot size of 40 hectares, this restriction was proposed to be removed, allowing no limitation on lot size to facilitate development at BBGA. At the time, the site was partially zoned SP2 and partially zoned as Rural Landscape (RU), The intent was for the RU zoned area between the BBGA and the Southern Cross Business Park to be zoned as the new version of the SP2.

Based on this proposed zoning, the 2012 LUP identified a series of zones circling out from the critical infrastructure of the Runway and Terminal as follows:

- RZ1: Runway Zone, focussed on core aviation activities and encompassing the airside, inclusive of the runway, runways setbacks, taxiways and RPT apron
- ASZ1: Aviation Support Zone, inclusive of fuelling facilities, fire fighting and emergency services, security areas, navigational aids facilities and regulatory and operational setbacks
- TZ1: Terminal Zone, the Terminal building and its immediate surrounds, inclusive of a landscaped entrance area and an area allocated for future expansion
- GAZ1: General Aviation Zone, inclusive of the GA hangers, apron and taxiways, along with an area for expansion and the refuelling facility
- CPZ1: Car Parking Zone, encompassing the short and long-term car parking facilities
- CRZ1: Car Rental Zone, including the car rental bays and related holding yards and workshop areas
- CDZ1: Future Commercial Development Zone, area allocated for commercial opportunities, including hotels, offices, tourism and other aviation-related businesses
- GZ1: Gateway Entrance Zone, entrance area for the airport precinct with new airport road aligned to the terminal (site of current Southern Cross drive entrance to the southeast constructed post-2012); and

- IZ1: Southern Cross Estate Integration Zone intended as a business hub integrated with the airport precinct.

Figure 1 illustrates the previous 2012 Land Use Plan zones.

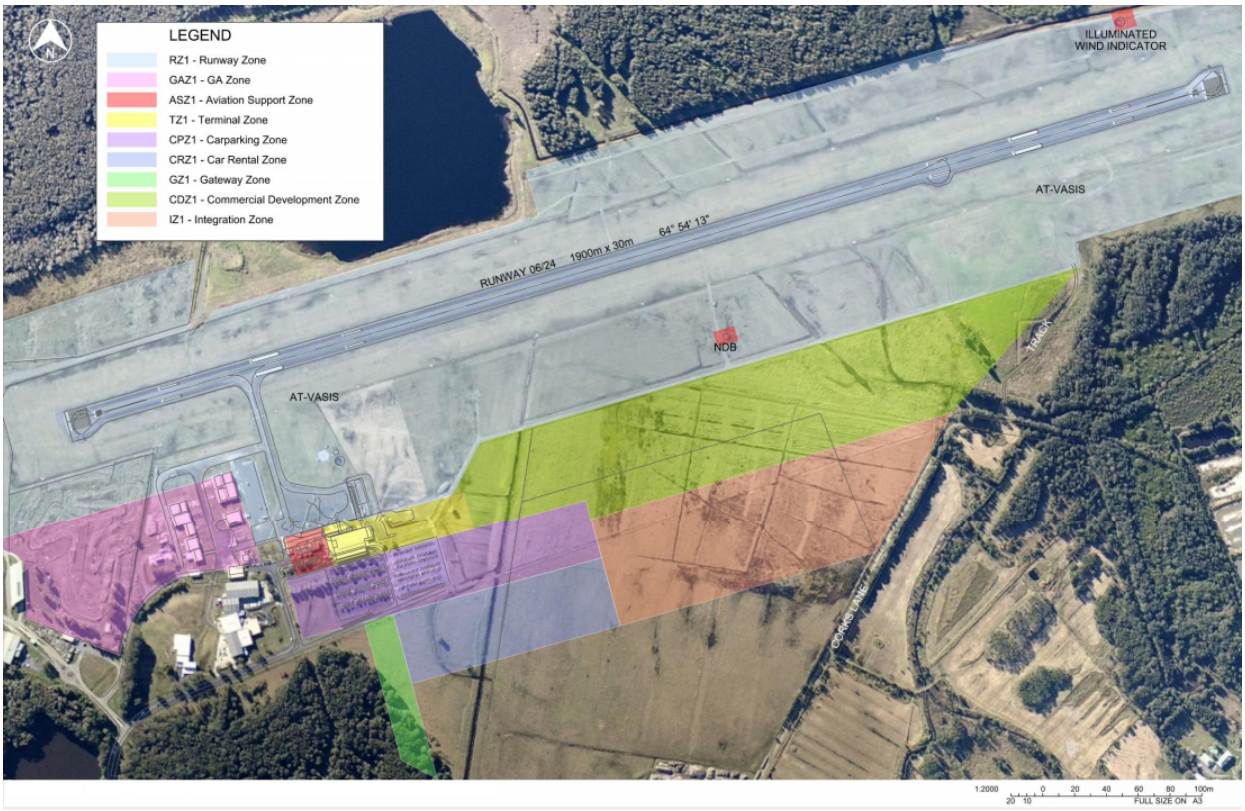


Figure 1: 2012 Land Use Plan

1.3 Development since 2005

Table 1 outlines the recent Terminal and landside works.

Table 1: Recent Terminal and landside works history

Year	Month	Description
2008	-	Extensions of the Terminal building, including check-in area, security screening area, and Check Baggage Screening (CBS) area.
2011	-	Extensions and renovations of the Terminal building, including departure area, security screening area, arrivals area and ground transport desks.
2014	December	Construction and commissioning of the Aviation Rescue and Fire Fighting Service (ARFFS) Station.
2015	-	Long-term parking extension, 144 car park spaces.
2017	March	Certified Air Ground Radio System (CAGRS) established to enhance the safety of air transport by providing a traffic information service to aircraft and airport support vehicles.
2018	June	Extensions and renovations of the Terminal building, including departure area, café, and retail outlet.
2021	June	Car parking extension, approximately 100 additional car park spaces. Terminal expansion in the departures area to the south.

Table 2 outlines the recent airport pavement works.

Table 2: Recent Airport pavement works history

Year	Month	Description
2008/09	-	06/24 Runway: Major asphalt shape correction and strengthening works were undertaken on the 06/24 Runway. The central 15 m of the 06/24 Runway used a dense-graded asphalt wearing course.
2012	November	RPT Apron Extension Project: Construction of new Taxiway B and extension of existing RPT Apron (AGL upgraded including Taxiway A and floodlighting).
2013	October	Runway Overlay Project: 06/24 Runway maintenance overlay and Taxiway A to the runway holding point.
2013	December	RPT Apron and GA taxiways: Asphalt patching on the RPT Apron and overlay on the GA taxiways.
2016	June	Taxiway A Upgrade Project: Widening of the existing Taxiway A to 18 m wide with 3.5 m wide shoulders (AGL relocation included).
2017	January	RPT Apron: Bay 4 asphalt patching.
2018	January	RPT Apron: Bay 3 asphalt patching.
2021	April	RPT Apron: Bay 3 and 4 asphalt patching.

2. Existing conditions

2.1 Introduction

Airports consist of three main spatial elements, which are generally defined as follows:

- Airspace – categorised as a 'controlled' or 'uncontrolled' airspace divided into several classes and classifications. The defined airspace enables aircraft to operate safely in and around the airport
- Airside – the secured portion of the airport that does not have public access; and
- Landside – the unsecured portion of the airport that has public access.

The existing facilities at BBGA are generally described herein.

2.2 Airspace

2.2.1 Obstacle Limitation Surface (OLS)

The OLS is a set of conceptual surfaces that identify the lower limits of an aerodromes airspace above which objects become obstacles to aircraft.

The OLS for the 06/24 Runway comprises the following:

- Conical Surface
- Inner Horizontal Surface
- Approach Surface
- Transitional Surface; and
- Take-Off Climb Surface.

Figure 2 illustrates the general relationship between the obstacle limitation surfaces, noting that the outer horizontal surface does not apply to the existing 06/24 Runway.

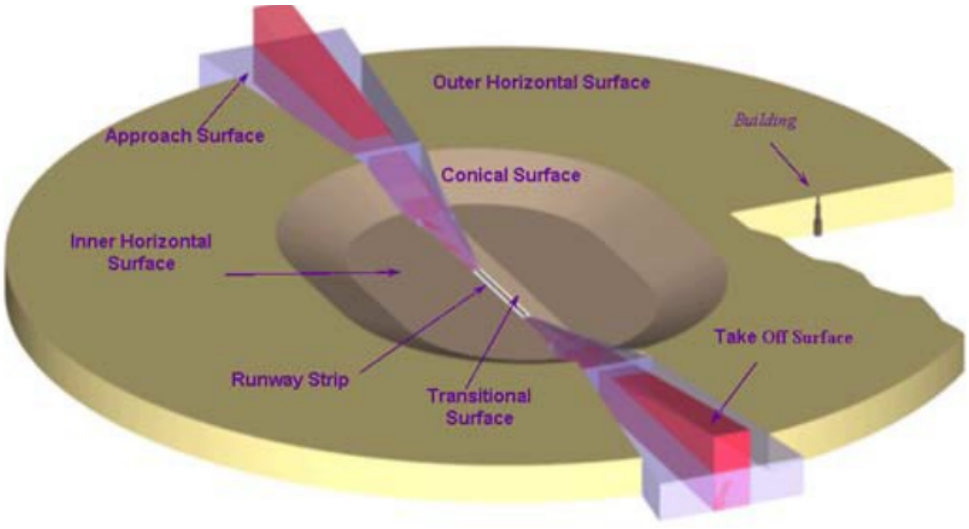


Figure 2: Relationship of outer horizontal, conical, inner horizontal and transitional surfaces, with an example obstacle (illustrate matters) (source: Part 139 (Aerodromes) MOS 2019)

2.2.2 Terminal Instrument Flight Procedures (TIFP) (approach and departure procedures)

The existing 06/24 Runway is categorised as a Code 3 instrument non-precision approach runway.

Instrument (Global Navigation Satellite System – GNSS) non-precision approach procedures have been published in the Aeronautical Information Publication (AIP) – Departure and Approach Procedures (DAP) for both the 06 Runway End and 24 Runway End approaches.

A Non-Directional Beacon (NBD) procedure has also been published.

Right-hand circuits are required for the 06 Runway End.

2.2.3 Critical obstacles

In accordance with the Civil Aviation Safety Regulations (CASR) and the Civil Aviation Safety Authority (CASA) Part 139 (Aerodromes) MOS 2019, and through undertaking the Aerodrome Technical Inspection (ATI) process, critical obstacles are identified on an annual basis. Critical obstacles may include vegetation, objects, and structures. Treatment of critical obstacles is required to maintain aircraft safety which are published in the AIP – En Route Supplement Australia (ERSA) Runway Distance Supplement (RDS).

2.3 Airside – Movement areas

2.3.1 Runway

The existing 06/24 Runway is categorised as a Code 3 instrument non-precision approach runway. The 06/24 Runway is approximately 1,900 m long and 30 m wide.

The 06/24 Runway pavement strength is classified as a Pavement Classification Number (PCN) of 15. The current PCN of 15 requires the majority of the RPT aircraft to operate under a pavement concession on the 06/24 Runway.

2.3.2 Taxiways

Taxiway A

Taxiway A is approximately 180 m long and 18 m wide with 3.5 m wide shoulders. Taxiway A connects the RPT Apron to the 06/24 Runway.

The pavement strength of Taxiway A is classified as a PCN of 15.

Taxiway B

Taxiway B is approximately 180 m long and 18 m wide with 3.5 m wide shoulders. Taxiway B connects the RPT Apron to the 06/24 Runway.

The pavement strength of Taxiway B is classified as a PCN of 15.

GA Taxiways and Taxilanes

The GA Taxiways are approximately 10.5 m wide and connect to Taxiway A. The GA Taxilanes are approximately 10 m wide, and service 10 sites with 12 hangars and the refuelling area.

The GA Taxiway pavements are restricted to aircraft below 5,700 kg Maximum Take-Off Weight (MTOW).

2.3.3 RPT Apron

The current RPT Apron configuration accommodates aircraft parked at an angle, by aircraft maneuvering under their own power to enter the aircraft parking position and exit the aircraft parking position (power-in/power-out).

The RPT Apron is approximately 200 m long and 85 m wide. The RPT Apron has four primary parking bays and services the regular movements at the airport. Currently, Ground Support Equipment (GSE) is stored adjacent to the RPT aircraft bays; however, the majority of the GSE is stored to the east of the Terminal Building.

The pavement strength of the RPT Apron is classified as a PCN of 15.

2.3.4 Aeronautical Ground Lighting (AGL)

The AGL system comprises the following:

- Low-intensity elevated runway edge lights
- Low-intensity elevated runway threshold and end lights
- Low-intensity elevated taxiway lights
- Low-intensity elevated holding point lights
- Runway Threshold Identification Lights (RTIL)
- Pilot-Activated Lighting Control (PALC) system
- 'T' Visual Approach Slope Indicator System (T-VASIS)
- Illuminated Wind Direction Indicator (IWDI)
- Apron floodlighting; and
- Standby power generator.

2.3.5 Navigational Aids (NAVAIDs)

The NAVAIDs comprise the following:

- Non-Directional Beacon (NBD).

2.3.6 Other aerodrome facilities

The other aerodrome facilities comprise the following:

- Certified Air Ground Radio System (CAGRS)
- Aerodrome Frequency Response Unit (AFRU)
- Signal circle
- Airside markings; and
- Gable markers.

2.3.7 Meteorological information

BBGA is classified as a Category B airport for the purpose of issuing Terminal Aerodrome Forecasts (TAF). Weather information is issued by the Bureau of Meteorology (BoM) and disseminated through Airservices Australia (AsA). Category B forecasts are issued and are valid for 12 hours as a minimum, with an amendment service during the

validity period.

The Aerodrome Weather Station is located to the east of the RPT Apron.

Meteorological information to pilots is provided through the following:

- AsA pilot briefing services; and
- Aerodrome Weather Information Service (AWIS) is provided on a 24-hour basis via a dial-up telephone service and a radio broadcast on frequency 134.8.

2.3.8 Airside security

BBGA receives RPT operations and open charter aircraft. The Department of Home Affairs' Cyber and Infrastructure Security Centre (CISC) has deemed BBGA a 'security controlled airport'. BSC currently implements an approved Transport Security Program (TSP) which addresses Checked Bag Screening (CBS), passenger screening, unauthorised entry (i.e. signage, fencing, access, security zones and security risk assessments), in accordance with the guidelines issued by CISC.

A series of security facilities are currently provided within the existing Terminal building, including a full-body scanner within the departures – security screening point. Refer to **Section 2.6.2** for further details.

The 2.4 m high perimeter security fence is provided from the Terminal and encompasses the airport perimeter.

2.3.9 Airside roads

The airport perimeter roads range from grass to unbound gravel.

2.4 Airside – General Aviation (GA) facilities

2.4.1 Aircraft types

Various fixed-wing, piston-engine, turbo-propeller, jet aircraft, and helicopters operate in the GA Area. Aircraft vary from Code A to Code C (GA Apron Bay 1 only). GA aircraft manufacturers include Cessna, Piper, Beechcraft, Mooney, and Grumman.

2.4.2 General facilities

The GA facilities include the following:

- GA Taxiways and Taxilanes
- GA Hangars; and
- Aviation Gasoline (AVGAS) fuel bowser adjacent to the GA Apron Bay 1 (the refuelling bowser currently only services Code A aircraft with a wingspan less than 15m).

The GA Apron and Hangar Area connect to Taxiway A. The GA Taxiways and Taxilanes service 10 sites with 12 hangars. The hangars are used for a combination of commercial and private uses, including aircraft maintenance and charter flights.

2.4.3 Access

Pin code gates are provided in the GA area, providing private access to the existing hangars.

2.5 Airside – Support facilities

2.5.1 Emergency services

The ARFFS station is on-site within the airport boundary, providing a CAT 6 service. The ARFFS station operates during hours coincident with RPT operations (for greater than 30 passengers).

Additional emergency services are provided as required by the Police, Fire and Rescue, the Rural Fire Service, and Ambulance.

2.5.2 Maintenance

The BBGA Operations Team maintain the airport grounds. The BSC electrical maintains the electrical infrastructure, including the AGL and standby power generator.

2.5.3 Fuel

Both jet fuel and AVGAS are stored in the fuel storage area adjacent to the GA Apron Bay 1. The fuel storage area is owned and operated by Viva Energy.

Viva Energy is a private company responsible for dispensing fuel within the airport.

AVGAS fuel is stored in an underground 55,400 litre tank. Jet A1 is stored in two above-ground tanks with a capacity of 52,200 litres and 53,800 litres. The above-ground fuel tanks are fully bunded.

Jet fuel is dispensed to RPT and charter aircraft by a mobile fuel tanker with a capacity of 16,000 litres.

AVGAS is dispensed through a smart card (credit card) controlled fuel bowser adjacent to the GA Apron Bay 1.

2.5.4 Ground Support Equipment (GSE)

The airlines and their ground handling agents own and operate various GSE to support their operations. The GSE is stored in the designated areas on the RPT Apron. GSE includes; mobile Ground Power Units (GPUs), mobile Pre-Conditioned Air (PCA) units, passenger stairs, passenger ramps, disabled passenger lifts, container loaders, belt loaders, bag trolleys and bag containers.

2.6 Landside – Terminal facilities

2.6.1 Departures – Check-in area and Checked Bag Screening (CBS)

The check-in area is located at the western end of the Terminal, and currently accommodates check-in facilities for Qantas, Jetstar, Virgin Australia, and FlyPelican. The current CBS configuration consists of eight common user airline check–in counters and a single lateral bag make-up loop with an Explosive Detection System (EDS) machine.

Checked baggage is manually handled directly onto the waiting baggage trolleys or baggage containers. Similarly, with Oversize or Out-Of-Gauge (OOG) bag screening, the oversized bags are manually loaded onto the metering conveyor prior to the CBS (EDS).

2.6.2 Departures – Screening and security

A series of security facilities are currently provided within the existing Terminal, including the multi-view X-ray machine, full-body scanner and search rooms.

2.6.3 Departures – Departure lounge

The departures lounge consists of passenger seating, toilets, a newsagent/convenience store (Relay), and a café/bar (Beach Grill), which provides both takeaway and eat-in café/bar facilities. The departure area has external views facing the RPT Apron. The departure area has three departure gates which are generally allocated to a specific airline.

2.6.4 Arrivals – Arrivals hall and baggage reclaim area

The arrivals hall and baggage reclaim area is located at the eastern end of the Terminal. It consists of a single baggage reclaim belt with a presentation length of approximately 30 m. Baggage trolleys and baggage containers are manually positioned, and checked baggage is manually handled onto the reclaim carousel by the airline agents.

The Terminal has six rental car check-in booths located along the eastern wall and southern wall of the Terminal.

A visitor services booth is located on the northern wall of the Terminal. Adjacent to the visitor services booth, a ‘reservation and information’ board has been provided, which contains hardcopy brochures and flyers.

2.6.5 Existing level of service

To monitor the operational service performance of the existing Terminal facilities, or for planning new Terminal facilities, the Level of Service (LoS) concept was developed by the International Air Transport Association (IATA) and has been adopted generally, as a guidance framework for airports.

The LoS assessment is typically assessed by simulation (especially for future facilities), point-to-point studies (i.e. passenger counts and timing etc.) and/or visual observations. For future Terminal facilities, all of the sub-systems should be assessed, which includes passenger circulation, passenger holding and passenger processing requirements.

Table 3 details the typical LoS assessment outlined in the current IATA Airport Development Reference Manual (ADRM).

Table 3: LoS assessment (source: IATA – Airport Development Reference Manual (ADRM))

			Space		
			Overdesign	**Optimum**	**Sub-Optimum**
			Excessive or empty space	Sufficient space to accommodate necessary functions in a comfortable environment	Crowded and uncomfortable
Maximum Waiting Time	**Overdesign**	Overprovision of resources	Overdesign	Optimum	Sub-Optimum >Consider improvements
	Optimum	Acceptable processing and waiting times	Optimum	Optimum	Sub-Optimum >Consider improvements
	Sub-Optimum	Unacceptable processing and waiting times	Sub-Optimum >Consider improvements	Sub-Optimum >Consider improvements	Under-Provided >Reconfigure

An LoS assessment was undertaken for the existing Terminal and identified the following:

Departure

- Major congestion and insufficient space at the kerb during drop-off
- Major congestion and insufficient space in the baggage make-up area during peak times
- Major congestion and insufficient space at the screening point during peak times
- Unacceptable passenger processing and waiting times at the screening point during peak times
- Insufficient offices and passenger interrogation areas for airport security staff
- Major congestion, insufficient space and insufficient seating in the departure lounge during peak times
- Unacceptable passenger circulation in the departure lounge during peak times
- Insufficient toilets during peak times; and
- Insufficient office space for airlines.

Arrivals

- Major congestion and insufficient space at the kerb during pick-up
- Major congestion and insufficient space at the bag reclaim during peak times
- Unacceptable passenger circulation in the bag reclaim area during peak times; and
- Insufficient toilets during peak times.

Table 4 provides a summary of the existing Terminal sub-systems.

Table 4: LoS of the existing Terminal sub-systems

	Overdesign – Space AND Maximum Waiting Times	**Optimum – Space AND Maximum Waiting Times**	**Sub-Optimum – Space AND Maximum Waiting Times**	**Under-Provided – Space AND Maximum Waiting Times**
Terminal Sub-Systems	Overdesign	Optimum	Sub-Optimum >Consider improvements	Under-Provided >Reconfigure
Departure – Kerb drop-off				✈
Departure – Check-in (conventional only, no self-service kiosks)			✈	
Departure – CBS and baggage make-up area				✈
Departure – Security control and screening			✈	
Departure – Departure lounge				✈
Departure – Departure gate				✈
Arrival – Baggage claim				✈
Arrival – Car rentals			✈	
Arrival – Kerb pick-up				✈

Further details are provided in **Section 4.9.3** regarding the current space available and waiting times based on the current Terminal layout.

2.7 Landside – Ground transport

2.7.1 General

The current ground transport system users consist of passengers, staff and employees, operators, shuttle buses, public bus, taxis, ride-share, car rental vehicles, and private vehicles to and from BBGA.

The assessment of the external road network is not within the scope of the 2022 LUP, however, there are several vehicle routes to access the airport precinct.

There is no existing dedicated external pedestrian access or bicycle lanes to the airport precinct. However, internal pedestrian walkways have been provided throughout the existing car parks.

The internal road network (i.e. to access the car parks) has two access points from Southern Cross Drive and Airport Boulevard. The existing departure drop-off and arrivals pick-up can be congested during peak times, with vehicles queuing on the internal road and Southern Cross Drive.

2.7.2 Short-term (general) parking

Short-term (general) parking for the public is located in the primary car park, south of the Terminal.

Automatic boom gates were installed in October 2022, complete with vehicle number plate recognition technology. The vehicle number plate is recorded upon entry to the car park.

General parking is charged at an hourly rate or daily rate. There are two pay stations inside the Terminal (arrivals and departure), whereby the customer can enter their vehicle number plate and pay the fee. Cash payment is only available at the pay stations inside the Terminal.

Customers can also pay the fee upon exit at the boom gate via credit card.

Currently, there are no charging stations for electric or hybrid vehicles.

2.7.3 Short-term premium parking

Short-term premium parking for the public is located southwest of the Terminal, with undercover parking provided. Premium parking is charged at a daily rate.

Currently, there are no charging stations for electric or hybrid vehicles.

2.7.4 Long-term (general) parking

Short-term and long-term parking for the public are not distinguished; therefore, all parking is classified as ‘general’ parking. Refer to **Section 2.7.2** for further details.

2.7.5 Rental car parking

Rental car parking is located southeast of the Terminal. Rental car pick-up and returns are both within the rental car park.

Currently, there is no airport owned off-site rental car parking or charging stations for electric or hybrid vehicles.

The current rental car companies include; Avis, Budget, Europcar, Hertz, SiXT, and Thrifty.

2.7.6 Bus stops, taxis, and rideshare

The shuttle bus, taxi, and ride-share areas are at the eastern end of the Terminal. Designated areas are provided for shuttle buses and taxis/rideshare services.

Shuttle buses service Ballina, Lennox Head, Byron Bay, and Lismore through various local bus companies.

A public bus (Route 640) services Ballina, Lennox Head, Byron Bay interchange and Mullumbimby, operating Monday to Sunday and public holidays (not Christmas Day). The public bus stop is located on Southern Cross Drive.

2.7.7 Access and curb presentation

The short-term premium car park, general car park, and rental car park are all located close to the Terminal, with access by foot via pedestrian paths.

Access to the bus, taxi and ride-share area is also by foot, which is located close to the eastern end of the Terminal.

To access the Terminal from the public bus stop, customers are required to walk through the general car park via designated pedestrian paths.

The private vehicle departure drop-off and arrival pick-up are located in the same area at the face of the Terminal. The length of the curb presentation is approximately 75 m. For further details regarding LoS, refer to **Section 2.6.5** for further details.

2.7.8 Existing capacity

For context, without detailed traffic data (i.e. traffic counts etc.) for the existing external road network in the vicinity of BBGA, it appears that the road network is operating efficiently and reliably.

The current (2022) car park spaces available are presented below in **Table 5**:

Table 5: Current (2022) car park spaces available at BBGA

Facility	Current (2022) Car Park Spaces
Short-term (general) car park	225
Short-term (premium) car park	112
Car rental car park	157
Staff car park	54
Total	**548**

In addition, the dedicated shuttle bus, taxi, and ride-share area at the eastern end of the Terminal, have provided 49 car spaces and five shuttle bus parks.

The current (2022) car park space demand and car park space shortfall are based on the following:

- Estimated car park space shortfalls are based on the current car park layout and designated car park (i.e. short-term (general), short-term premium etc.) with 528,684 annual passengers in 2021 with 1.5% annual growth rate for 2022
- The average and maximum cark park space occupancy number has been used to account for the worst-case scenario based on 528,684 annual passengers in 2021 with 1.5% annual growth rate for 2022; and
- Assuming that the staff and previous long-term car park (now repurposed as short-term (premium) car park) have not been seasonality adjusted.

The current (2022) car park space demand and car park space shortfall are presented below in **Table 6**.

Table 6: Current (2022) car park space demand and car park space shortfall at BBGA

Facility	Current (2022) Car Park Supply	Estimated Car Park Space Demand		Estimated Car Park Space Shortfall		Estimated Combination of All Car Park Spaces	
		Average Occupancy	Maximum Occupancy	Average Occupancy	Maximum Occupancy		
Short-term (general) car park	225	111	124	- 114	- 101	- 8	The car park space demand is 8 less than the supply
Short-term (premium) car park	112	203	205	91	93		
Car rental car park	157	172	185	15	28	28	The car park space demand is 28 more than the supply
Staff car park	54	31	37	- 23	- 17	- 17	The car park space demand is 17 less than the supply
Total	**548**					**3**	**Overall, the shortfall of car park spaces is 3 based on the maximum occupancy**

As illustrated in **Table 6**, the estimated average and maximum car park space occupancy have been considered. The estimated average car park space occupancy is a day based on the average parking demand over the year. The estimated maximum car park space occupancy represents the busiest month of the year, which is January. Therefore, it is necessary to supply sufficient car park spaces for the maximum car park space occupancy as there is no alternative car parking available off-site.

The maximum car park space occupancy has been estimated for the year 2022. The short-term (general) car park and staff car park space occupancy are estimated to be below the supply by 101 and 17 car park spaces, respectively. The short-term (premium) car park and the car rental car park have estimated car park space shortfalls of 93 and 28 car park spaces, respectively.

Considering that the short-term (general) car park and the short-term (premium) car park can potentially share their car parking spaces, the supply and demand have therefore been combined. When combined, there is an estimated surplus of 8 car park spaces (i.e. the estimated available supply exceeds the demand).

Overall, the car park space supply is expected to have an estimated shortfall of 3 car park spaces during the maximum car park space occupancy period in 2022 if the car parking spaces are shared.

3. Aviation demand forecast

3.1 Basis of forecast

The outbreak of COVID-19 has significantly impacted the global aviation industry. While airline route networks and load factors demonstrate signs of recovery, albeit uneven, considerable uncertainty in forecasting future domestic and regional passenger growth remains across the world.

In Australia, domestic pandemic responses have had considerable and unforeseen consequences on airport operators, including BBGA. For example, in mid-2020 the airport briefly and unexpectedly became the busiest port in Australia following the imposition of significant travel restrictions and domestic border closures. The grounding of international aircraft, highly-dynamic border arrangements and high-level intrastate demand drove passenger and aircraft movements through BBGA to unprecedented levels. While the international and domestic restriction measures have since been removed, the impacts continue to be observed as airlines seek to re-establish their air routes and expand their network.

Similarly, significant adverse weather events have occurred in the preceding five years and are anticipated to continue into the future, with impacts ranging from delayed or cancelled services to the full closure of airports. The latter case was observed in 2022 when BBGA was closed to fixed-wing traffic following flooding rains.

Given these uncertainties, the forecasts in the 2022 LUP are indicative and based on key factors and assumptions, including the following:

- Airline operators servicing regional destinations such as BBGA will continue to trend with larger, quieter, safer and more fuel-efficient aircraft. This may be predominantly through the:
  - Replacement of older generation jet aircraft, including the B717, B737-300 and B737-400, with next-generation jet aircraft variants which are aligned with increased capacity
  - Replacement of older and current generation turboprop aircraft (i.e. DHC8-400), with next-generation jet aircraft variants which are aligned with increased capacity; and
  - Introduction of future-generation jet aircraft, including future B737 variants, A320 variants and A220 variants.
- Average load factors will continue to increase through greater seating density and highly competitive yield management practices
- Accommodation constraints within the greater Northern Rivers region will persist over the planning horizon, limiting future growth
- Barriers to international travel will continue to be relatively high in the short-term (i.e. travel costs imposed on the customer, complexities associated with travel and customer hesitancy) and maintain increased levels of domestic demand; and
- The evolution of Low-Cost Carriers (LCCs) will continue to reduce airfare costs, and therefore it will stimulate air traffic growth. The anticipated introduction of an Ultra-Low-Cost Carrier (ULCC) to the Australian market is likely to accelerate this trend.

The forecasts in this 2022 LUP also assume the following:

- There will be no significant ‘air transport shocks’ over the next 20 years, including total closure of domestic and international borders, market failures, or significant weather events limiting the airport availability; and
- Macro-environment factors leading to lower discretionary expenditure on air travel are anticipated to persist in the short-term only, with limited impact on long-term BBGA passenger or aircraft movements.

3.1.1 Methodology

The following four steps were taken in the development of passenger and aircraft movement forecasts for BBGA:

1. ***Passenger, aircraft and macro-environment data collection***

Historic passenger and aircraft movement data was sourced from third-party providers (i.e. Lime Intelligence), which may vary marginally from other sources, such as the Bureau of Infrastructure and Transport Research Economics (BITRE) and AsA. The 2022 LUP considers influential economic and market factors, including the Australian Gross Domestic Product, NSW Gross State Product, regional accommodation stock and population forecasts, which were also collected from various publicly available sources.

2. ***Review of current and future domestic aircraft fleet composition, aircraft forward order book and aircraft manufacturer forecasts***

Open-source information on current and future domestic aircraft fleet compositions was reviewed to identify likely trends in aircraft allocation for routes servicing BBGA. Direct consultation with the major and minor carriers was also undertaken to validate the assumptions related to the future aircraft fleet compositions.

3. ***Forecast model development***

Multiple supervised machine learning models were built, trained and tested against the collected data, with the most performant being selected to generate 20-year passenger and aircraft movement forecasts. Forecasts were then benchmarked against qualitative and quantitative projections from sources including, but not limited to, the BITRE, Tourism Research Australia (TRA) and IATA.

4. ***Consultation with key stakeholders***

Direct consultation with key stakeholders was undertaken in two stages:

✈ **Stage 1:** RPT network development team

Meetings were conducted with the following airline stakeholders during the preparation of draft forecasts to discuss the methodology and clarify key assumptions and inputs:

- Virgin Australia
- Regional Express Group; and
- Qantas Group.

✈ **Stage 2:** Stakeholder survey

An electronic survey was distributed to key local stakeholders, including tenants, service providers, local community groups and high-frequency users of BBGA. The survey was available for a period of two weeks commencing late July 2022 and asked a range of questions in regard to planning, likely future use, infrastructure needs and BBGA's perceived strengths, weaknesses, and opportunities.

A number of face-to-face meetings were also held with tenants to better inform planning for future GA infrastructure, services, and facilities.

3.1.2 Historical data

Passenger and aircraft movement forecasts in this 2022 LUP were based on historical data for BBGA sourced from various providers, including the BITRE, TRA, and third-party providers such as Lime Intelligence. Historical information and data between 1986 and 2022 were available (to a varying degree). Extrapolation and interpolation were undertaken where required to facilitate the development of forecast models.

3.2 Aircraft movement forecasts

The mix of RPT aircraft servicing BBGA is expected to transition to larger, more fuel-efficient next-generation aircraft such as the B737 MAX variants, A320 variants and A220 variants over the planning horizon.

In 2021, Qantas selected the A320neo and A220 as the preferred aircraft for the long-term renewal of its domestic narrow-body jet aircraft. These aircraft will progressively replace the B737-800 and B717 aircraft over the next decade. It is anticipated that the A220 will be deployed throughout the majority of the Qantas's domestic and regional network over the next 20 years, potentially replacing the older and current turboprop aircraft operating on BBGA routes.

Virgin Australia is expected to transition to predominantly B737 variants over the life of this 2022 LUP by progressively replacing its F100 aircraft with new B737-700 and B737-800 aircraft, and introducing the new B737 MAX variants to its aircraft fleet.

Similarly, potential new ULCC market entrant Bonza, will introduce new services using the B737 MAX 8 aircraft and will likely maintain a single aircraft variant into the future.

3.2.1 Regular Public Transport

Between 2017 and 2019, RPT movements at BBGA averaged approximately 4,500 per year, growing at an average annual rate of less than 1%. Given the domestic airline fleet and network plan, this trend is anticipated to continue over the next 20 years, resulting in approximately 5,300 movements per year by 2042.

3.2.2 General Aviation (GA)

Business and GA movements at BBGA declined at an average annual rate of approximately 6.5% from 2015 to 2019, which was compounded by Sharp Airlines' withdrawal of its freight service in early 2017. In 2019, GA movements totalled approximately 2,100 per year, with helicopter operations accounting for more than 10% of all GA movements in that year.

However, throughout 2020, GA movements increased by more than 60% to approximately 3,400 per year. This was largely driven by COVID-related border closures and the relocation of flight training activities from nearby Gold Coast Airport.

In the long term, increased demand is anticipated for small-scale specialised freight, corporate charter and helicopter activities at BBGA. A number of initiatives have also been identified that are likely to have a positive influence on the annual GA movements. It is anticipated that the GA movements will reduce from the current high level of GA activity. GA movements are expected to stabilise at approximately 3,000 per year over the next 20-year planning horizon.

3.3 Passenger forecasts

3.3.1 Overview

Passenger forecasts are a critical input into long-term planning. They directly inform development and expansion plans for passenger terminals, airside and landside infrastructure, and supporting services and facilities.

Seasonality

BBGA is an established tourism and leisure destination and exhibits a high degree of seasonality in its passenger movements, typically aligned with national holiday periods. This pattern is anticipated to continue over the next 20 years.

Figure 3 presents the seasonality analysis of historical passenger movements.

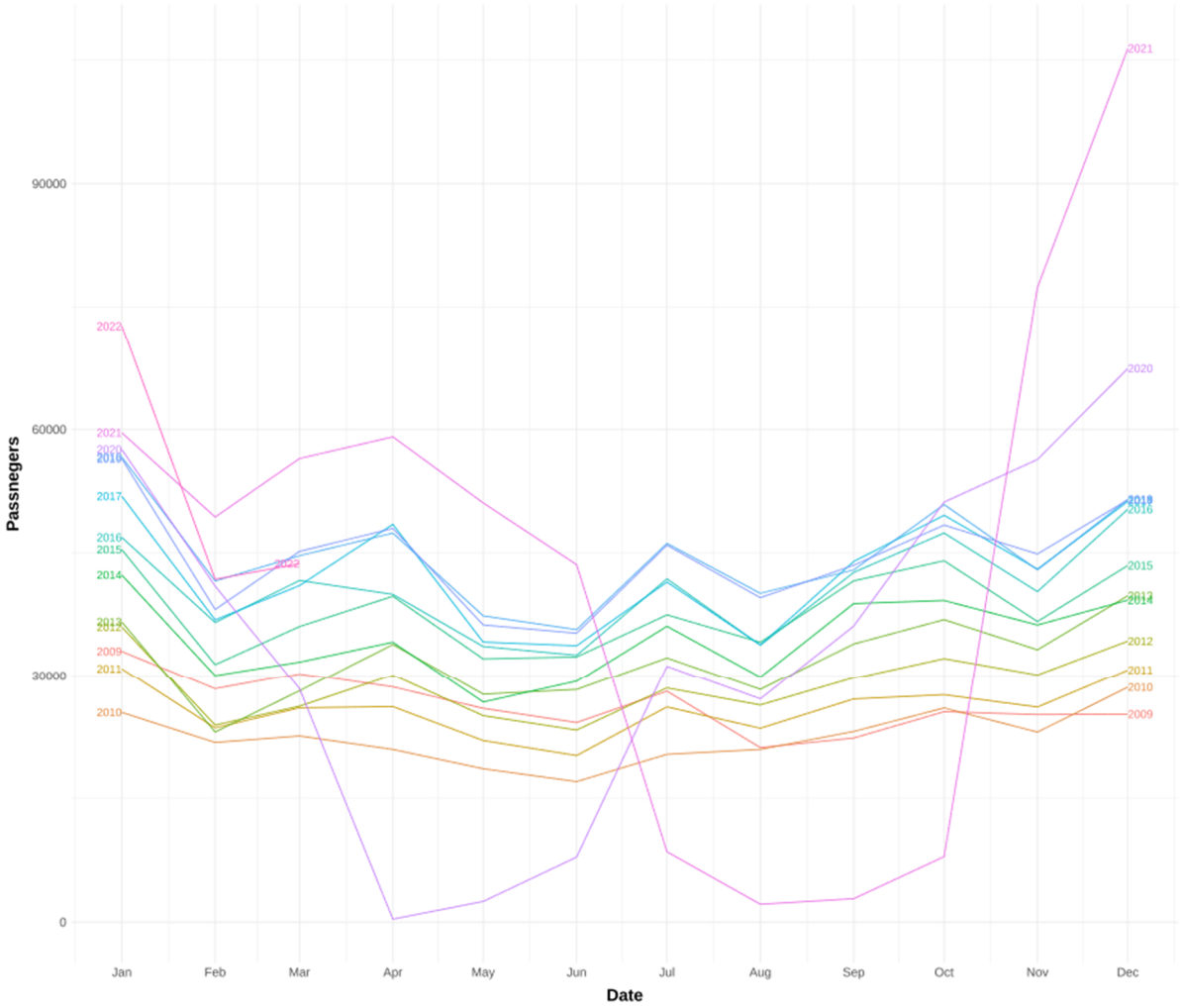


Figure 3: Historical passenger movements seasonality analysis

Note: Pre-COVID passenger volumes were highly seasonal, with peaks occurring approximately every three months.

Historical growth

In the three years preceding COVID-19, passenger growth rates at BBGA had stabilised at an average of approximately 1.5% per annum. This stabilisation was likely due to a maturing market and minimal structural changes occurring over the time period (i.e. no new market entrants, adverse geopolitical and economic events, material changes to service schedules, or the introduction of large-scale border or travel restrictions).

Figure 4 presents the trend analysis of historical aircraft and passenger movements. The analysis suggests that growth in annual passenger movements is not only strictly driven by the number of aircraft movements. For example, prior to 2019, while the trend in aircraft movements exhibited some variability, passenger movement numbers continued to increase. This suggests other factors, including increased load factors and up-gauging of aircraft may have had an influence.

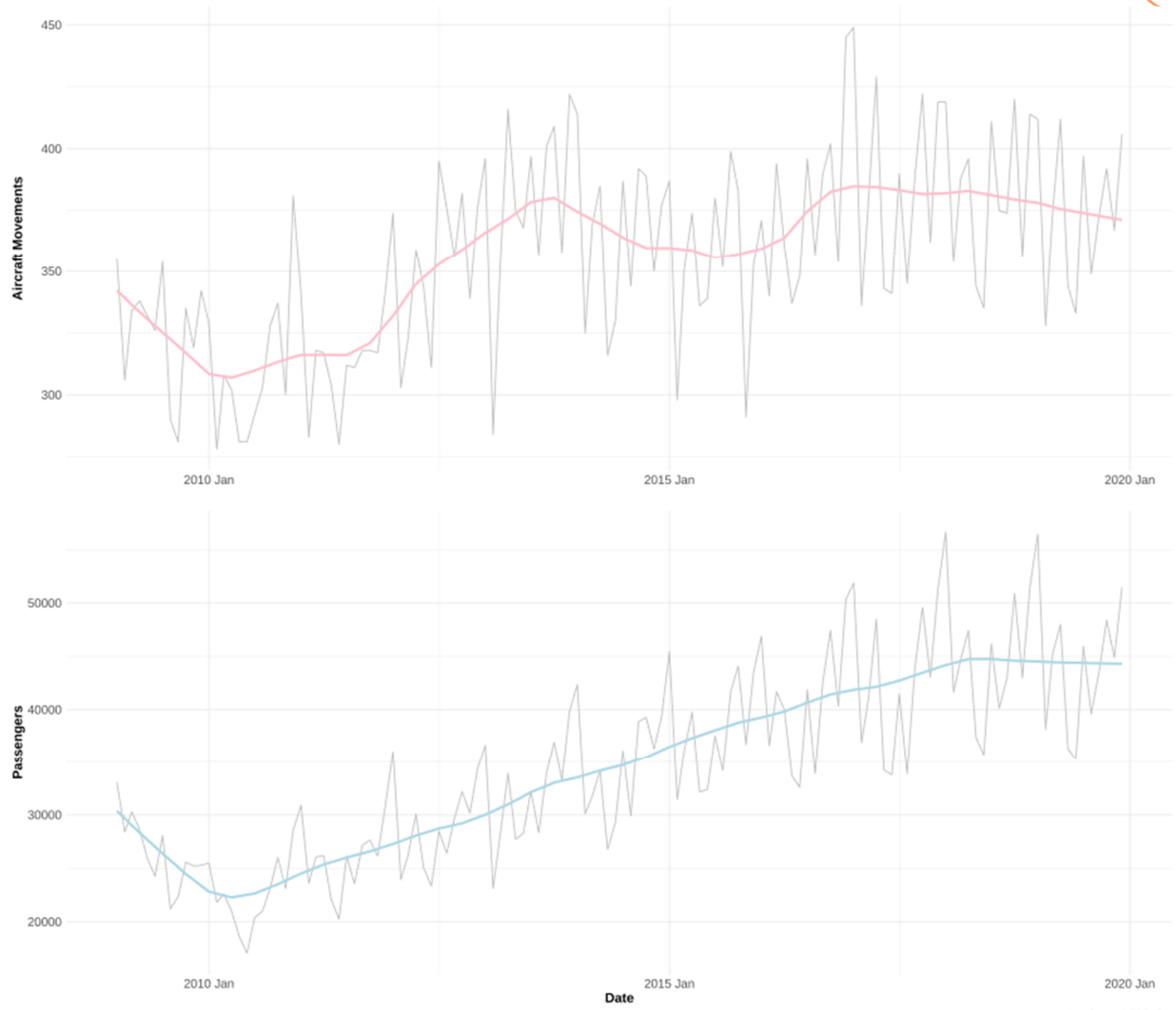


Figure 4: Trend analysis of historical aircraft and passenger movements

Note: Growth in passenger numbers through BBGA appears to have been driven by factors other than increasing aircraft movements.

Future new market entrant

The forecast introduction of Bonza (a new ULCC) to the Australian market is anticipated to stimulate domestic leisure travel across the country. However, the impact of BBGA passenger and aircraft movements will remain difficult to quantify. The ULCC proposed operating model, schedule, and likely competitive responses from existing carriers are expected to lift passenger movements in the short-term. However, the persistence of external constraints, such as limited accommodation within the Northern Rivers region, is likely to temper annual passenger growth rates over the coming decade.

3.3.2 Forecast scenarios

Passenger numbers

Annual passenger numbers at BBGA are forecast to grow from a base of 534,000 in FY2018/19 to more than 748,000 by FY2041/42. This reflects a near 40% increase in total, at an average annual growth rate of approximately 1.5% over the next 20-year period.

Aviation forecasting is inherently uncertain, therefore three scenarios were modelled presenting a range of expected

passenger movement numbers based on the inputs and assumptions detailed in **Section 3.1**. These scenarios are presented in **Table 7** and **Table 8**.

Table 7: Annual passenger movements – 5 year increments

Scenario	Financial Year			
	2026/27 (5 Year)	**2031/32 (10 Year)**	**2036/37 (15 Year)**	**2041/42 (20 Year)**
High	624,747	676,351	728,622	781,073
Medium (Likely)	**613,882**	**658,963**	**703,643**	**748,202**
Low	602,463	636,335	668,794	699,436

Table 8: Passenger movement growth rates – 5 year increments

Scenario	Financial Year			
	2026/27 (5 Year)	**2031/32 (10 Year)**	**2036/37 (15 Year)**	**2041/42 (20 Year)**
High	3.1%	1.6%	1.5%	1.4%
Medium (Likely)	**2.8%**	**1.4%**	**1.3%**	**1.2%**
Low	2.4%	1.1%	1.0%	0.9%

Growth rate

As seen in **Figure 4**, passenger growth through BBGA over the planning horizon is expected to continue to be driven by the up-gauging of aircraft servicing BBGA, increased seat densities and load factors, marginal increases in service frequencies and the expansion of BBGA's network to previously unserved domestic markets.

3.3.3 5 year forecast

Annual passenger movements are anticipated to grow from present levels to more than 613,800 by FY2026/27. The highly seasonal nature of BBGA's passenger movements and peaks occurring on a quarterly basis (refer to **Section 3.3.1** for further details) is expected to continue over the life of this 2022 LUP.

3.3.4 10 year forecast

In FY2031/32, annual passenger movements are expected to reach approximately 658,900 representing an annual growth rate of 1.4% over the preceding 5 years.

3.3.5 15 year forecast

Passenger numbers are expected to increase from 658,900 in FY2031/32 to 703,600 by FY2036/37 at a growth rate of approximately 1.3% per year over the 5 year period.

3.3.6 20 year forecast

By FY2041/42, passenger numbers at BBGA are expected to reach 748,200 at a growth rate of approximately 1.2% per year over the five year period. The slight reduction in rate compared to previous periods is attributable to BBGA becoming a mature market with growth opportunities continuing to be constrained by the limited availability of supporting tourism infrastructure and accommodation services within the region.

3.3.7 Passenger peaks

There are various ways to determine the passenger peaks for departing and arriving passengers which are based on passenger circulation, holding and processing requirements. Based on the predicted passenger flow and predicated passenger circulation, holding and processing for each facility sub-system, a combination of the following passenger peaks determination has been adopted using the following definitions:

- International Air Transport Association (IATA) – Second busiest day in an average week during the peak month – leads to peak hour determination
- Federal Aviation Administration (FAA) – Peak month average day – leads to the peak hour determination based on the average day in a peak month

Table 9 summarises the combined passenger peak hour range, which is based on the annual passenger movements. Refer to **Section 3.3.2** for the annual passenger movements.

Table 9: Combined passenger peak hour range based on annual passenger movements – 5 year increments

Scenario	Financial Year			
	2026/27 (5 Year)	**2031/32 (10 Year)**	**2036/37 (15 Year)**	**2041/42 (20 Year)**
Medium (Likely)	**613,882 annual passengers** 375-425 passenger peak hour range	**658,963 annual passengers** 460-510 passenger peak hour range	**703,643 annual passengers** 520-595 passenger peak hour range	**748,202 annual passengers** 580-680 passenger peak hour range

4. Future requirements

4.1 Stakeholder consultation

Key local stakeholders, including tenants, service providers, local community groups, and high-frequency users of BBGA were invited to respond to an electronic survey on the future development of the airport.

The survey was available for a period of two weeks commencing late July 2022 and asked a range of questions related to planning, including likely future use of the airport, preferred development activities and anticipated infrastructure needs. It should be noted that given its targeted nature and low sample size (26 responses in total), results from the survey are not considered representative of the broader population.

4.1.1 Key strengths

Key strengths of BBGA were identified in the survey included:

- The location of BBGA with its proximity and air services network to the major commercial and tourist regions of Gold Coast and Byron Bay; and
- From a GA tenant perspective, the ease of access and availability of fuel services.

4.1.2 Representative users

The majority of respondents holding a lease at BBGA at the time of the survey predominantly engaged in GA, aircraft maintenance, emergency services and flight training activities. Leaseholders also appeared to be long-term tenants, with nearly a third having held their leases for more than 20 years.

Additionally, nearly 70% of all survey respondents anticipated an increase in their current use of BBGA over the next five years.

4.1.3 Aviation developments

Survey respondents were asked to rank a list of potential infrastructure and facilities upgrades for BBGA in order of what they considered most important to pursue. The average position of each item in the list was determined across all responses, resulting in a final ranked list.

A strong preference for hangar developments, taxiway upgrades and general aviation expansion was observed, with little separation between their average rankings. Notably, the preference for taxiway upgrades largely involved the construction of a parallel taxiway to accommodate existing and future aircraft types and to facilitate aircraft entry and exit to the runway.

The above findings were mirrored in face-to-face consultation sessions, with interviewees expressing a strong desire for increased hangar developments, parking areas for GA aircraft, the development of a Fixed Base Operator (FBO) facility and the construction of a parallel taxiway to increase runway efficiency.

Beyond the development of a Helicopter Landing Site (HLS), respondents showed comparatively weaker preferences for initiatives such as utility upgrades, runway extension, apron and terminal expansions.

4.1.4 Non-aviation developments

Survey respondents were asked to identify their level of support for potential non-aviation developments at BBGA.

As illustrated in **Table 10**, strong support was shown for commercial, industrial and green space development, and moderate support was shown for improvements to ground transportation. Conversely, low support was shown for recreational facilities among all respondents.

Table 10: Development activities – indicative levels of support

Activity	Degree of Support				
	Significant Degree	Moderate Degree	Neutral	Small Degree	None
Commercial Development	30.8%	15.4%	23.1%	15.4%	15.4%
Industrial Development	15.4%	26.9%	19.2%	19.2%	19.2%
Green Spaces	11.5%	26.9%	30.8%	7.7%	23.1%
Ground Transportation	19.2%	26.9%	26.9%	15.4%	11.5%
Recreational Facilities	15.4%	15.4%	23.1%	19.2%	26.9%

4.1.5 Further developments

The development of an FBO facility at BBGA was identified by several respondents as a key initiative required to support the current and future demand for corporate aircraft and charter operations. Additionally, respondents also nominated increased availability of aircraft parking spaces and dedicated GA facilities (e.g. tie downs, hangar developments, GA terminal) as being central to the future growth of GA activity at BBGA.

4.2 Legal framework

BBGA is not subjected to the planning framework set out in the *Airports Act 1996*, as the airport is not a leased federal airport, and future development will be subject to the NSW planning framework. The NSW planning framework consists of an array of legislation, policy, and public authorities. The framework is subject to constant change and may be divided into two broad areas: land use planning; and development control.

All NSW local governments must develop an Integrated Planning and Reporting (IPR) Framework under the legislative requirements prescribed in the *NSW Local Government Act 1993*. This framework has been put in place to encourage councils, the community, and other organisations to work together to plan for the future in an efficient and collaborative manner.

Activities at BBGA have the characteristics of a regional airport – both commercial and GA, with ancillary services such as car hire, charter etc.

4.3 Regulatory requirements

4.3.1 Basis for planning – regulatory requirements

CASA has been established by the Commonwealth Government and, through powers vested by the Civil Aviation Act 1998, made responsible for the safety regulation of civil aviation in Australia and of Australian registered aircraft operating overseas.

CASA administers the Civil Aviation Safety Act 1998 through the CASRs and the Manual of Standards (MOS) – the CASRs establishing the broader regulatory framework and the Part 139 (Aerodromes) MOS 2019 setting out the specifications or standards that CASA deems should be uniformly applied to ensure the “safety of air navigation”.

CASRs Part 139 and Part 139 (Aerodromes) MOS 2019 are the basis for the preparation of the 2022 LUP.

One of the major aspects of the CASRs and MOS is to ensure that:

- Aerodromes are planned, constructed, and operated in a manner that minimises risk to aircraft operations; and
- Aerodrome infrastructure is adequately planned, constructed, and maintained to preserve the operational capability of the aerodrome.

4.3.2 Planning criteria

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

- International standards and recommended practices (ICAO)
- National standards and advisory publications (CASA); and
- Local standards, guidelines and practices (including the National Airports Safeguarding Framework (NASF)).

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

4.3.3 Aerodrome Reference Code (ARC)

The planning and design of various aerodrome facilities is controlled by mandatory standards based on the selected Aerodrome Reference Code (ARC) for each particular airport. The intent of the ARC is to provide a simple method for inter-relating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodrome facilities that are suitable for the aeroplanes that are intended to operate at the aerodrome.

The code is composed of three elements that are related to the aeroplanes performance characteristics and dimensions. Element 1 is a number based on the aeroplanes reference field length. Element 2 and 3 are letters based on the aeroplane wing span and/or outer main gear wheel span.

For taxiway and apron works, the various geometric standards are controlled by Code Element 2 and 3. The code letter for Element 2 and 3 is determined from **Table 11**, by selecting the code letter which corresponds to the greatest wing span and/or the greatest outer main gear wheel span, whichever gives the more demanding code letter of the aeroplanes for which the facility is intended. For instance, if code letter C corresponds to the aeroplanes with the greatest wing span and code letter D corresponds to the aeroplanes with the greatest outer main gear wheel span, the code letter selected would be “D”.

Table 11: Aerodrome reference codes (source: Part 139 (Aerodromes) MOS 2019)

Code Element 1		Code Element 2		Code Element 3
Code Number	**Aeroplane Reference Field Length (ARFL)**	**Code Letter**	**Wing Span**	**Outer Main Gear Wheel Span (OMGWS) (a)**
(1)	**(2)**	**(3)**	**(4)**	**(5)**
1	Less than 800 m	A	Up to but not including 15 m	OMGWS up to but not including 4.5 m
2	Not less than 800 m	B	15 m up to but not including 24 m	OMGWS 4.5 m up to but not including 6 m
3	Not less than 1200 m	C	24 m up to but not including 36 m	OMGWS 6 m up to but not including 9 m
4	Not less than 1800 m	D	36 m up to but not including 52 m	OMGWS 9 m up to but not including 15 m
		E	52 m up to but not including 65 m	
		F	65 m up to but not including 80 m	

(a) Distance between the outside edge of the main gear wheels

The following current planning and design elements are applicable to BBGA.

Table 12: Current planning and design elements applicable to BBGA

Movement Area	Current Planning and Design Elements
06/24 Runway	• Code 3 instrument non-precision approach
Taxiway A	• Wingspan – 24 m up to but not including 36 m • OMGWS 9 m up to but not including 15 m
Taxiway B	• Wingspan – 24 m up to but not including 36 m • OMGWS 9 m up to but not including 15 m
GA Taxiway and Taxilanes	• Wingspan – up to but not including 15 m • OMGWS up to but not including 4.5 m
RPT Apron	• Wingspan – 24 m up to but not including 36 m • OMGWS 9 m up to but not including 15 m

4.3.4 Transitional provisions

In accordance with the *Part 139 (Aerodromes) Manual of Standards Amendment Instrument 2020 (No.1)* dated 15 July 2020, the transitional provisions were described which are due to the changes in the rules from the old *Manual of Standards Part 139 – Aerodromes Version 1.14 January 2017*, to the new *Part 139 (Aerodromes) Manual of Standards 2019*.

To maintain the current airside facilities and the layout of the existing Aerodrome, the Aerodrome Operator must *grandfather* the existing airside facilities. A *grandfathered facility* means an existing aerodrome facility and the OLSs associated with an existing runway that is part of the existing aerodrome facility, which does not comply with the new *Part 139 (Aerodromes) Manual of Standards 2019*.

There are several aerodrome facilities, including the OLSs which are categorised as *grandfathered facilities*, allowing the Aerodrome Operator (BSC) to operate, and maintain their certification with the submission of supporting documentation to CASA.

4.3.5 National Airports Safeguarding Framework (NASF)

The National Airports Safeguarding Framework (NASF) provides guidance on planning requirements for development that affects aviation operations. This includes building activity around airports that might penetrate operational airspace and/or affect navigational procedures for aircraft.

The NASF was developed by the National Airports Safeguarding Advisory Group, which includes representatives from Commonwealth Infrastructure and Defence departments and aviation agencies, state and territory planning and transport departments, and the Australian Local Government Association.

The aim of the NASF is to:

- Improve safety outcomes by ensuring aviation safety requirements are recognised in land use planning decisions
- Improve community amenity by minimising noise-sensitive developments near airports, including through the use of additional noise metrics; and
- Improve aircraft noise-disclosure mechanisms.

The NASF is intended to provide guidance to state, local, and territory governments that can, in turn, be used to guide assessment and approvals for land use and development on and around identified airports.

As such, it is the responsibility of each jurisdiction to implement the NASF into the NSW Government and BSC planning scheme.

BSC will continue to work with the NSW government to fully implement the NASF, which will address the airport safeguarding issues within the planning horizon.

4.4 Land use plan zoning and land use strategy

The potential future land uses proposed for BBGA have been identified by dividing the airport site into five zones named according to the predominant use and development proposed for each zone. The five zones included in the 2022 LUP are as follows:

- Runway Zone
- General Aviation (GA) Zone
- Terminal Zone
- Car Parking Zone; and
- Gateway Zone

The 2022 LUP is largely consistent with the previous 2012 LUP, with the following notable changes detailed below:

- Expansion of the Runway Zone to accommodate a parallel taxiway, potential future ATC tower, and a potential future relocated ARFF station

- Removal of the Commercial Development Zone by providing an expanded Runway Zone
- Removal of the Integrated Zone (Southern Cross Estate) as the development of this area is viewed as being beyond the planning horizon of the 2022 LUP; and
- Merger of the Car Parking Zone and Car Rental Zone into one Car Parking Zone.

The 2022 LUP provides an appropriate level of certainty by responding to business and community expectations while maintaining flexibility within the airport precinct.

Refer to **Drawing 100** in **Appendix A** for further details.

4.5 Airspace

4.5.1 General overview

The protection of airspace in the vicinity of BBGA is important to ensure the safety of aircraft and the surrounding community by eliminating obstacles in the airspace that may pose a hazard to airborne aircraft. CASA manage the regulation of airspace in Australia, which represents 11% of the world's airspace. CASA does this through the Office of Airspace Regulation (OAR). The OAR administers the Australian airspace architecture under the:

- Airspace Act 2007; and
- Airspace Regulations 2007.

CASA has reviewed the airspace in and around Ballina, to assess the current risks and propose solutions after seeking feedback from stakeholders. To address concerns identified in the airspace review, CASA made nine recommendations for improvement, including a requirement for BBGA to become a controlled aerodrome.

Based on the recommendations, the physical change in the short-term to BBGA is as follows:

- Install an ADS-B ground station in the vicinity of Ballina; and
- BBGA becomes a controlled aerodrome with an associated control zone and control area, with the construction of a new Aerodrome Control Service (i.e. ATC tower).

4.5.2 Obstacle Limitation Surface (OLS)

The Obstacle Limitation Surface (OLS) defines the protection requirements for the initial and final stages of a flight take-off, preparation to land and the landing itself. Visual connectivity between the airport runway and the pilot is of particular importance during these phases, as is the pilot's ability to avoid obstacles and other aircraft.

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

The future OLS plans are not intended to have official status in land use planning decisions, however, they should be considered during the approvals process. The existing OLS plan will retain official status in land use planning decisions until such time as the runway configuration changes.

4.5.3 Future Obstacle Limitation Surface (OLS)

There are some critical elements that must be addressed to transition from the current grandfathered Code 3 instrument non-precision approach runway and to comply with the current requirements in Part 139 (Aerodromes)

MOS 2019 (with the potential to be instructed by CASA in the short to medium term), or to establish a potential future Code 3 instrument CAT I precision approach runway, which includes the following:

- Current – Code 3 Non-Precision Approach Instrument Runway (which applies to the current 06/24 Runway layout) as a *grandfathered facility (based on the existing overall runway strip of 150 m and an approach inner edge of 150 m)*
  - Transitioning from an approach inner edge of 150 m to an approach inner edge of 280 m will significantly increase the number of obstacles that infringe on the transitional surface
  - Transitioning the approach slope from 3.33% to 2% in the first section length of 3,000 m – currently, there are approximately two obstacles that currently infringe the approach path (i.e. vegetation). Adopting an approach slope of 2% impacts at least 18 current obstacles (i.e. vegetation); and
  - The inner horizontal surface will continue to be infringed by approximately five obstacles (i.e. lit tower (NBN tower) and vegetation).
- Potential future – Code 3 CAT I Precision Approach Instrument Runway (which applies to the current 06/24 Runway layout) as a *future facility (based on a new overall runway strip of 280 m and an approach inner edge of 280 m if an Instrument Landing System (ILS) or similar was introduced to the 06/24 Runway).*
  - The outer horizontal surface must be established with a height of 150 m and radius of 15,000 m.
  - The conical surface height will change from 75 m to 100 m
  - The inner approach surface must be established with a width of 120 m, the distance from the threshold of 60 m, a length of 900 m and a slope of 2%; and
  - A precision runway and approach CAT I lighting system must be provided to serve a precision approach CAT I runway supporting instrument approach operations with visibility less than 1,500 m. The standard length of the approach lights extends from the runway threshold for a distance of 900 m (which will be subject to a further study to assess feasibility).

In summary, in the short term, the current grandfathered OLS for the 06/24 Runway will likely remain in place.

In the medium term, it is likely that the OLS would need to be amended based on the current requirements contained in Part 139 (Aerodromes) MOS 2019. However, should the runway length be extended or amended in the near future, the grandfather provisions may no longer apply, if the extension is for a larger aircraft type. As required, the approach and take-off departure surfaces will need to be re-established and updated in the published information in AIP-ERSA RDS.

4.5.4 Terminal Instrument Flight Procedures (TIFP) (approach and departure procedures)

In the short to long term, it is likely that the approach and departure procedures that have been published in AIP-DAP will remain in place.

For an instrument CAT I precision approach runway, the required minima is below 250 feet. The current minima from AIP-DAP for the 06/24 Runway varies between 350 and 660 feet (depending on the adopted procedure). Therefore, it may not be feasible to satisfy the requirement of a minima below 250 feet.

However, to establish new TIFPs for a CAT I precision approach in the long term, a comprehensive survey of objects and structures will need to be used as the basis by the procedure designers (i.e. AsA or a consultant) and assess that CAT I procedures can be achieved.

4.6 Airside – Movement areas

4.6.1 Airside infrastructure decision-making principles

Regional airports such as BBGA, play a critical role in serving their community and the Australian economy more broadly. However, the broad economic impacts are typically difficult to quantify and may potentially only be recognised over a long period of time.

It is therefore important that the decision-making principles are considered as a component within the whole process of evaluating the benefits for a certain airside project. Accordingly, the project should be considered alongside the major community (social), environmental, planning, and budgetary considerations.

Using the Australian Federal Government guidelines published by Infrastructure Australia, the following general decision-making principles can act as a guide for infrastructure development and delivery, which can be adopted for an active airport environment. The key to the future of BBGA can be founded upon the following (in the short to long term):

- **The need** – maintaining and/or improving a public asset that is a facilitator for economic growth
- **The benefit (advantages)** – strategically maintaining and/or improving a public asset that can safely and adequately support airlines, business, emergency services, recreational activities and the community into the future
- **Timely upgrading** – for airside infrastructure to address a capacity shortfall or demand, provide operational flexibility to accommodate a range of aircraft and operators into the future
- **Consider the long term** – analyse the immediate capacity shortfall or demand and consider the range of future options to mitigate the risk to the level of service to the community
- **Analysis of multiple options** – consider and analyse the constraints to determine the proposed solutions; and
- **Approximate indicative budget estimate capital cost** – quantify the likely cost to deliver the airside project based on previous experience.

4.6.2 Development strategy by aircraft types

Based on the forecast demand detailed in **Section 3**, the likely future representative aircraft types for the planning for BBGA are shown in **Table 13,** which is based on publicly available information.

Table 13: Representative aircraft types for planning purposes (indicative only)

	Typical Aircraft Type	Code	MTOW (kg)	Approximate passengers
Current				
RPT	DHC8-400	3C	29,000	74
	A320-200	4C	77,000	180
	B737-700	4C	70,080	128
	B737-800	4C	79,016	176
RPT and/or Occasional Charter	Global Express (G650)	3C	45,135	17
	B717-200	4C	53,524	125
	E190	4C	51,800	114
5 Year				
RPT	A220-100	3C	60,781	120
	A220-300	4C	67,585	150
	A320-200	4C	77,000	180
	A320-200neo	4C	79,000	180
	B737-700	4C	70,080	128
	B737-800	4C	79,016	176
RPT and/or Occasional Charter	Global Express (G650)	3C	45,135	17
	B717-200	4C	53,524	125
	E190	4C	51,800	114
10 Year				
RPT	A220-100	3C	60,781	120
	A220-300	4C	67,585	150
	A320-200	4C	77,000	180
	A320-200neo	4C	79,000	180
	B737-700	4C	70,080	128
	B737-800	4C	79,016	176
	B737 MAX 8	4C	82,600	178
RPT and/or Occasional Charter	Global Express (G650)	3C	45,135	17
	B717-200	4C	53,524	125
	E190	4C	51,800	114
20 Year				
RPT	A220-100	3C	60,781	120
	A220-300	4C	67,585	150
	A320-200	4C	77,000	180

	Typical Aircraft Type	Code	MTOW (kg)	Approximate passengers
	A321neo	4C	93,500	185
	A320-200neo	4C	79,000	180
	B737-700	4C	70,080	128
	B737-800	4C	79,016	176
	B737 MAX 8	4C	82,600	178
	B737 MAX 10	4C	89,800	204
RPT and/or Occasional Charter	Global Express (G650)	3C	45,135	17
	B717-200	4C	53,524	125
	E190	4C	51,800	114

4.6.3 Runway length

pitt&sherry undertook a separate runway length assessment in July 2021 in order to estimate the potential aircraft types and potential forecast aircraft traffic with:

- Consideration of aircraft currently in operation in Australia and the Asia Pacific region;
- Consideration of aircraft that may potentially operate from capital cities and regional centres to BBGA;
- Consideration of the maximum payload (passengers and freight) for the potential aircraft; and
- Aircraft potentially departing from their origin at Maximum Take-Off Weight (MTOW) and landing at their destination at Maximum Landing Weight (MLW).

The study assumed that the existing operators' aircraft fleets and current trends in the aircraft manufacturing industry, that the aircraft types assessed will be representative of the most economical alternatives (considering operating costs, payload potential and aircraft performance/range) for potential aircraft operators to service BBGA into the future. In essence, a time series assumption was made that extrapolates the current trends of aviation activity in Australia and assumes that those factors that currently determine the business model for aircraft operators will continue into the future.

The assessment concluded that a proposed runway length of between 2,350 m and 2,400 m will be able to operate flights between BBGA and Perth at a potential full payload and in International Standard Atmosphere (ISA) + 15°C conditions, which is considered to be economical for A220-100, A220-300, A320-200, A320-200neo, A321, A321neo and B737-800 aircraft.

A potential runway length of 2,200 m will be able to operate flights between BBGA and Auckland at a restricted payload (i.e. the aircraft operators will need to balance the fuel and payload requirements to ensure the route is economical) and in ISA + 15°C conditions, which is considered to be economical for A220-100, A220-300, A320-200, A320-200neo, A321, A321neo and B737-800 aircraft.

Based on the majority of the domestic destinations from BBGA (i.e. domestic routes are generally less than 1,650 km), the aircraft operators have the option to balance the fuel and payload requirements to ensure that the air travel route remains feasible for the range of aircraft that was studied.

Lengthening the existing 06/24 Runway would continue to allow all aircraft currently utilising the runway to operate. The ARC selection is now the Aerodrome Operator's decision; however, the Aircraft Operators can choose to use the runway at their own discretion, which is dependent on any weight and performance limitations.

Therefore, BBGA may extend the runway and still maintain its original ARC of Code 3 classification.

4.6.4 Runway width

The existing 06/24 Runway caters for all current aircraft that are operating at BBGA with an OMGWS for 6 m up to but not including 9 m, with the exception of the DHC8-400 (which is operating under a previous CASA instrument from 2017).

In the short to long term, to accommodate aircraft of a higher OMGWS category (i.e. OMGWS above 9 m to 15 m), it may not be necessary to widen the existing runway from 30 m to 45 m if the Aircraft Operator gains approval from CASA for the specific aircraft.

4.6.5 24 Runway End Safety Area (RESA)

A Runway End Safety Area (RESA) can be provided at the end of the runway strip. The RESA's primary function is reducing the risk of damage to an aircraft that undershoots or overruns the runway.

The existing 24 RESA is grandfathered as it does not comply with the required minimum length of 90 m outside the runway strip, due to the physical and environmental constraints, and a portion of Crown Land. Therefore, the primary objective is to retain the minimum runway length of 1,900 m.

In order to provide a compliant 24 RESA with a minimum length of 90 m in the future, the most economical solution is to undertake the following:

- Convert 120 m long of the existing 24 Runway End pavement by:
  - Providing a 60 m long clearway by moving the runway strip to the west (i.e. using the existing runway pavement)
  - Demolish and remove 60 m of the existing runway pavement; and
  - Construct a 90 m long RESA (i.e. unbound pavement).
- Construct new runway pavement or runway starter extension of 120 m in length at the 06 Runway End (i.e. flexible pavement); and
- The 06 Runway End clearway and 06 RESA may require reconstruction (i.e. flexible pavement and unbound pavement); however, both the 06 Runway End clearway and 06 RESA will remain compliant.

Refer to **Drawings 101** in **Appendix B** for further details.

4.6.6 Taxiways

Various parallel and connector taxiway options were assessed based on minimising delays (i.e. backtracking and queuing etc.) and increasing the overall capacity of the runway and taxiway system.

In the future, it is anticipated that a parallel taxiway and connecting taxiways will be planned and constructed in the medium to long term to improve aircraft safety and efficiency of the airside movement area system, using a combination of rigid pavement and flexible pavement.

The parallel taxiway should have connecting taxiways to both the 06 Runway End and the 24 Runway End, which will improve operational efficiency. The connecting taxiways could be constructed incrementally, as dictated by aircraft traffic, but ultimately a link from the eastern 24 Runway End via a parallel taxiway should be planned.

The existing ARFF station is required to be relocated to accommodate the parallel taxiway. This is due to achieving the minimum separation from the runway centreline to the taxiway centreline, in accordance with Part 139 (Aerodromes) MOS 2019. Planning should allow the parallel taxiway to be located at a minimum separation over its full length.

Refer to **Section 4.6.6, Drawing 101** in **Appendix B** and **Drawing 102** in **Appendix C** for further details.

4.6.7 RPT Apron

The RPT Apron is anticipated to extend to the east in the short to long term, using rigid pavement for the aircraft parking positions and flexible pavement for aircraft taxiing to the aircraft parking position via apron taxiways or taxilanes. Various RPT Apron options were assessed based on power-in/power-out operations or power-in/push-back operations.

In the short term, it has been assumed that the RPT Apron will continue to operate under a power-in/power-out arrangement. However, it is feasible to accommodate either power-in/power-out or power-in/push-back operations in the short term. With power-in/push-back operations, there may be some operational restrictions regarding the length of the aircraft for each aircraft bay, for example.

If desired by aircraft operators in the short to medium term, a power-in/push-back arrangement for aircraft parking could be explored to increase the aprons' capacity, and minimise the extent of the apron pavement required. The implications of a power-in/push-back arrangement on the transitional surface of the OLS will need to be considered and assessed in detail.

In the medium to longer term, a power-in/push-back arrangement is feasible to provide a tug parking area at the head-of-stand, airside road (head-of-stand) and a pedestrian walkway. This option also provides a shorter walking distance to the easternmost bay, which is likely to be preferred by the airlines.

In the medium to longer term, the development of the RPT Apron is heavily dependent on demand, commercial arrangements with the airlines and aircraft parking redundancy (i.e. when an aircraft is unserviceable).

Refer to **Drawing 101** in **Appendix B** and **Drawing 102** in **Appendix C** for further details.

4.6.8 GA Aprons and taxilanes

Please refer to **Section 4.7.1** for more details regarding the GA areas and taxilanes.

Refer to **Drawing 102** in **Appendix C** for further details.

4.6.9 Aeronautical Ground Lighting (AGL)

The current AGL system will be upgraded in 2023. The new AGL system will comprise the following:

- Duct and pit system
- Medium-intensity elevated runway edge lights (at 60 m light spacing)
- Medium-intensity elevated runway threshold and end lights
- Medium-intensity elevated taxiway lights
- Medium-intensity elevated holding point lights
- PAPI – 06 Runway End; and
- PAPI – 24 Runway End.

As part of the upgrade of the AGL system, the existing T-VASIS will be decommissioned.

In the long term, if a CAT I precision approach runway is required, high-intensity lights will be required.

4.6.10 Meteorological information

The likely upgrade or relocation of the current BoM weather station would still provide vital weather information at BBGA. The upgrade or relocation of the BoM weather station could occur during this 2022 LUP planning horizon.

Refer to **Drawing 101** in **Appendix B** for further details.

4.6.11 Navigational Aids (NAVAIDs)

NBD – The likely decommissioning of the NBD could occur during this 2022 LUP planning horizon.

4.6.12 Other aerodrome facilities

ADS-B – As noted in **Section 4.5.1**, CASA has recommended installing an ADS-B ground station in the vicinity of Ballina to improve surveillance. AsA will potentially plan and design the location of the ADS-B ground station during this 2022 LUP planning horizon.

ATC tower – The likely planning and construction of an ATC facility would provide vital air traffic control services at BBGA and the surrounding airspace. The installation of an ATC facility could potentially occur during this 2022 LUP planning horizon. Refer to **Drawing 101** in **Appendix B** for further details.

4.6.13 Airside security

The Legislative Framework for the regulation of aviation security is contained in the Aviation Transport Security Act 2004 ATSA), and its associated Regulations (Aviation Transport Security Regulations 2005 (ATSR)). The main purpose of this framework is to safeguard against unlawful interference with aviation activities, which includes criminal and/or unsuitable behaviour that may threaten the security of aircraft, airports, passengers, crews and the general public.

The Department of Home Affairs' Cyber and Infrastructure Security Centre (CISC) is Australia's security regulator for aviation, maritime and the offshore oil and gas industries.

Since BBGA receives RPT operations and open charter aircraft, the Department of Home Affairs' CISC has deemed BBGA as a 'security controlled airport'. BSC currently implements an approved Transport Security Program (TSP) which addresses CBS, passenger screening, unauthorised entry (i.e. signage, fencing, access, security zones and security risk assessments), in accordance with the guidelines issued by the Department of Home Affairs' CISC, the ATSA and ATSR.

For BSC, whether the RPT Apron is expanded or the Terminal building is extended within the planning horizon, the implications on security will need to be assessed at the time against the current regulations and approved by the Department of Home Affairs CISC.

In any instance, if the Terminal building is extended in the future, the provision of additional space for departure checked bag screening and passenger screening, for example, should be accommodated as discussed in **Section 4.9**.

The security fence that encloses the airport will need to be maintained and upgraded as required. As discussed above, the security regulations are subject to change and may change during this 2022 LUP planning horizon.

4.6.14 Airside roads

The airport perimeter roads will be to be maintained and upgraded as required.

4.6.15 Ultimate airside layout plan

The ultimate airside layout plan was assessed based on the following:

- Option 1 – Relocation of the existing ARFF station; and
- Option 2 – Retain the existing ARFF station location.

The ultimate airside layout plan for Option 1 is preferred by BSC and is provided in **Drawing 101** in **Appendix B**, with consideration of the following key elements:

- Provision of a runway extension or starter extension at the 06 Runway End (120 m long and 30 m wide), 06 Runway End clearway and 06 RESA, in order to provide a compliant 24 Runway End clearway and 24 RESA
- Provision of a Code C parallel taxiway, south of the 06/24 Runway
- Provision of Code C connecting taxiways from the 06/24 Runway to the parallel taxiway
- Provision for RPT Apron expansion to the east to accommodate up to 8 x Code C aircraft primary parking position bays; and
- Provision for GA area expansion to the west, with associated taxiways and taxilanes.

The following summary for Option 1 and Option 2 for the ultimate airside layout plans outlines the general advantages, disadvantages, timely upgrade, and potential long-term implications in **Table 14**. Refer to **Section 4.6.1** for further details.

Table 14: Summary for ultimate airside layout plan – Option 1 (relocation of the existing ARFF station) and Option 2 (retain the existing ARFF station location)

Facility	Advantages	Disadvantages	Timely Upgrade	Potential Medium to Long Term	Commentary
Ultimate Airside Layout Plan – Option 1 (relocation of the existing ARFF station)	• Improves the airside assets • Flexibility for the airlines/aircraft fleet • Flexibility for the airlines, based on demand and route analysis • Efficient and functional parallel taxiway layout – linear layout • Code C parallel taxiway increases capacity • Code C connecting taxiways increases capacity • Efficient and functional RPT Apron layout – linear layout • Increases the capacity of the RPT Apron • RPT Apron remains separate from the GA area • Increases the capacity of the GA area	• Demolition and relocation of the existing ARFFS • Demolition and relocation some of the existing GA hangars • Demolition and relocation of the NBD • Demolition and relocation of the BoM station • Demolition and relocation of the IWDI and signal circle • Demolition and relocation of Corks Hill. Potential line of sight issues from the ATC • Environmental and Aboriginal Heritage will be impacted • Higher capital cost	*Viable* • The 06/24 Runway remains open • Required for aircraft safety, compliance or inadequate capacity • Required to increase the capacity or functionality of the airside layout • Required by airline and/or aircraft demand • Required by industry demand and facilities *Not viable* • Close the 06/24 Runway • Divert airlines/flights to another port	• Fosters economic growth in the region (medium to long term) • Plan for the future with minimal redundant work • 10 Year – medium (likely) – 658,963 annual passenger movements • 20 Year – medium (likely) – 748,202 annual passenger movements	• The demolition and relocation of the ARFFS may not be viable • The demolition and relocation of Corks Hill may not be viable

Facility	Advantages	Disadvantages	Timely Upgrade	Potential Medium to Long Term	Commentary
Ultimate Airside Layout Plan – Option 2 (retain the existing ARFF station location)	• Improves the airside assets • Flexibility for the airlines/aircraft fleet • Flexibility for the airlines, based on demand and route analysis • Existing ARFFS remains • Existing NBD remains • Code C parallel taxiway increases capacity • Code C connecting taxiways increases capacity • Efficient and functional RPT Apron layout – linear layout • Increases the capacity of the RPT Apron • RPT Apron remains separate from the GA area • Increases the capacity of the GA area	• Less efficient and functional parallel taxiway layout. Potential line of sight issues from the ATC • Demolition and relocation of some of the existing GA hangars • Demolition and relocation of the BoM station • Demolition and relocation of the IWDI and signal circle • Demolition and relocation of Corks Hill. Potential line of sight issues from the ATC • Environmental and Aboriginal Heritage will be impacted • Medium capital cost	*Viable* • The 06/24 Runway remains open • Required for aircraft safety, compliance or inadequate capacity • Required to increase the capacity or functionality of the airside layout • Required by airline and/or aircraft demand • Required by industry demand and facilities *Not viable* • Close the 06/24 Runway • Divert airlines/flights to another port	• Fosters economic growth in the region (medium to long term) • Plan for the future with minimal redundant work • 10 Year – medium (likely) – 658,963 annual passenger movements • 20 Year – medium (likely) – 748,202 annual passenger movements	• The demolition and relocation of Corks Hill may not be viable

4.7 Airside – General Aviation (GA) facilities

4.7.1 Facilities

In the medium to longer term, it is desirable that all GA facilities be consolidated west of the existing RPT Apron. The current dispersion of light aircraft (Code A), larger aircraft (Code C), and rotor wing aircraft does not advantage any existing or likely future GA operators.

The future planning and construction of sealed taxiways and aprons for GA aircraft should be constructed to the west of the RPT Apron, with the opportunity to increase the aircraft parking areas for larger aircraft.

In the medium to longer term, some GA hangars will likely be relocated or removed to facilitate the planning and construction of a parallel taxiway adjacent to the GA aprons, in accordance with Part 139 (Aerodromes) MOS 2019.

BSC will continue to engage with the GA operators to find a resolution that will cater to the GA operator requirements, while providing for the medium to long-term planning for the GA area.

Similar with future FBO's, BSC will engage with potential operators to accommodate the likely FBO requirements, while providing for the medium to long-term planning for the GA area.

In the short to medium term, the planning and construction of ground-level Helicopter Landing Sites (HLS) (up to a main rotor dimension of 18 m) within the GA area could occur. Planning and construction should be in accordance with Part 139 (Aerodromes) MOS 2019 and the relevant Advisory Circular (AC).

Five GA concept plans were considered in determining the appropriate size and location of the General Aviation Zone within the 2022 LUP. Therefore, the included ultimate GA concept plan is preferred by BSC and indicates the size and scale of development available within that Zone. It is recommended that a detailed study be undertaken to determine the preferred ultimate GA arrangement before undertaking any further long-term development within the General Aviation Zone.

Refer to **Drawing 102** in **Appendix C** for further details.

4.8 Airside – Support facilities

4.8.1 Fuel

Based on the likely future air routes, fuel demand, and likely technological advancements in aircraft jet engines, a new dedicated fuel storage tank for Sustainable Aviation Fuel (SAF – i.e. biofuel or similar) may need to be provided in the medium to long term. Refer to **Drawing 102** in **Appendix C** for further details.

The current underground and above-ground storage tanks for jet fuel and AVGAS are likely to be adequate in the short to medium term. Currently, no space is available for additional fuel storage facilities adjacent to the existing GA Apron Bay 1.

4.8.2 Ground Support Equipment (GSE)

The aircraft (airline) operators own and operate various GSE to support their own operations. The future GSE is to be stored in the designated areas on or near the RPT Apron as required.

Future GSE store areas may need to be developed as the RPT Apron extends to the east, and may include a separate GSE storage area independent of the RPT Apron.

Alternatively, the development of dedicated GSE areas adjacent to the new aircraft parking bays can be constructed to suit future aircraft parking bay loads as the RPT Apron expands to the east.

4.9 Landside – Terminal facilities

4.9.1 General

IATA has published general guidelines through the Airport Development Reference Manual (ADRM) that assist and informs terminal planning and design. To achieve the planning objectives for the future Terminal, and provide virtually seamless processes for passengers as they travel through the Terminal, removing passenger flow obstacles and alleviating passenger conflict points, for example.

As part of these objectives, a long-term balance for the Terminal building should consider the passenger, the aircraft (airline) operator, relevant authorities, BBGA personnel (i.e. security, retail operators etc.) and adopting technology where appropriate. The impact is twofold; maximising the movement of passengers, bags and quality amenities and a sense of place that is safe and secure, which improves the attractiveness of the Terminal.

To prepare for the expected increase in passenger numbers over the next 20 years, BBGA will be required to undertake a number of developments to satisfy IATA's spatial and passenger waiting time requirements.

Much of the anticipated proposed development focuses on space, upgrading and expanding the existing Terminal building footprint, which includes the following:

- Expanding the departing – kerb drop-off
- Expanding the departing – CBS and baggage make-up area and facilities
- Expanding the departing – security control and point facilities
- Expanding departing – departures lounges
- Expanding departing – departure gates
- Expanding the arrivals – baggage claim area and facilities; and
- Expanding the arrivals – kerb pick-up.

The information presented in **Section 4.9.3** is for planning purposes and is indicative only. It is recommended that LoS should be assessed in detail based on the likely regulatory environment and standards at that specific point in time. The future Terminal facilities and all sub-systems should be assessed, including passenger circulation, holding, and processing requirements during the planning horizon and beyond.

4.9.2 Passenger flow

There is potential to eliminate current passenger congestion, passenger cross-flows and poor circulation during the planning horizon. Natural and unobstructed passenger flow with simple navigation between origin and destination through the departing and arriving processes are recommended as the primary objective for the Terminal building expansion during the planning horizon.

4.9.3 Level of service

Based on the combined passenger peak hour range in **Section 3.3.7**, **Table 15** summarises the current space and waiting times based on the current Terminal layout and the proposed future space and waiting times for the Terminal sub-systems to be rated as ‘Optimum’ in 5 year, 10 year, and 20 year.

Table 15: LoS of the proposed future Terminal sub-systems to be rated as 'Optimum' (source: IATA ADRM) for the 5 year, 10 year, and 20 year

Terminal Sub-Systems	**Current Space AND Maximum Waiting Times**		**Optimum Space AND Maximum Waiting Times Based on 5 Year Peak Demand**		**Optimum Space AND Maximum Waiting Times Based on 10 Year Peak Demand**		**Optimum Space AND Maximum Waiting Times Based on 20 Year Peak Demand**	
Departure – Kerb drop-off	**75 m** (total length for both drop-off and arrival)	**2-10 mins (estimate)**	TBD m	2-5 mins	TBD m	2-5 mins	TBD m	2-5 mins
Departure – Check-in (conventional service kiosks)	545 sqm (total area)	5-25 mins (estimate)	1.6 sqm/person	5-20 mins	1.8 sqm/person	5-20 mins	1.8 sqm/person	5-20 mins
Departure – Check-in (self-service kiosks)	N/A	N/A	1.6 sqm/person	3-7 mins	1.8 sqm/person	3-7 mins	1.8 sqm/person	3-7 mins
Departure – CBS and baggage make-up area	**280 sqm** (total area)	N/A	TBD sqm	N/A	TBD sqm	N/A	TBD sqm	N/A
Departure – Security control and screening	360 sqm (total area)	5-15 mins (estimate)	1.1 sqm/person	5-10 mins	1.2 sqm/person	5-10 mins	1.2 sqm/person	5-10 mins
Departure – Departure lounge (excluding retail and concession)	**475 sqm** (total area)	N/A	Seating space 2.1 sqm (50%-70% to be seated) Standing space 1.4 sqm (30%-50% standing)	N/A	Seating space 2.2 sqm (50%-70% to be seated) Standing space 1.5 sqm (30%-50% standing)	N/A	Seating space 2.2 sqm (50%-70% to be seated) Standing space 1.5 sqm (30%-50% standing)	N/A

Terminal Sub-Systems	Current Space AND Maximum Waiting Times		Optimum Space AND Maximum Waiting Times Based on 5 Year Peak Demand		Optimum Space AND Maximum Waiting Times Based on 10 Year Peak Demand		Optimum Space AND Maximum Waiting Times Based on 20 Year Peak Demand	
Departure – Departure gate (passenger queuing)	**See Departure Lounge**	**5-30 mins (estimate)**	1.1 sqm/person	5-20 mins	1.2 sqm/person	5-20 mins	1.2 sqm/person	5-20 mins
Arrival – Baggage claim area	**390 sqm (total area)**	N/A	1.6 sqm/person	N/A	1.7 sqm/person	N/A	1.7 sqm/person	N/A
Arrival – Baggage claim presentation	30 m	**0-20 mins (estimate)**	TBD m	0-15 mins	TBD m	0-15 mins	TBD m	0-15 mins
Arrival – Car rentals	90 sqm (total area)	0-25 mins (estimate)	1.6 sqm/person	0-15 mins	1.7 sqm/person	0-15 mins	1.7 sqm/person	0-15 mins
Arrival – Kerb pick-up	**75 m** (total length for both drop-off and arrival)	**2-15 mins (estimate)**	TBD m	2-5 mins	TBD m	2-5 mins	TBD m	2-5 mins

Table 16 summarises the LoS for the proposed future Terminal sub-systems to be rated as 'Optimum' in 5 year, 10 year and 20 year based on the annual passenger movements.

Table 16: LoS for the proposed future Terminal sub-systems to be rated as 'Optimum' in the 5 year, 10 year, and 20 year based on the annual passenger movements

Terminal Sub-Systems	Current Space AND Maximum Waiting Times		Annual passenger movements (5 Year)	Optimum Space AND Maximum Waiting Times Based on 5 Year Peak Demand		Annual passenger movements (10 Year)	Optimum Space AND Maximum Waiting Times Based on 10 Year Peak Demand		Annual passenger movements (20 Year)	Optimum Space AND Maximum Waiting Times Based on 20 Year Peak Demand	
Departure – Kerb drop-off	75 m (total length for both drop-off and arrival)	2-10 mins (estimate)	613,882	60 m -105 m (for drop-off only) *Excluding buses	2-5 mins	658,963	80 m -130 m (for drop-off only) *Excluding buses	2-5 mins	748,202	100 m - 170 m (for drop-off only) *Excluding buses	2-5 mins
Departure – Check-in (conventional service kiosks)	545 sqm (total area)	5-25 mins (estimate)	613,882	200 sqm - 400 sqm @ 1.6 sqm/person	5-20 mins	658,963	250 sqm - 500 sqm @ 1.8 sqm/person	5-20 mins	748,202	N/A – likely to be phased out	N/A – likely to be phased out
Departure – Check-in (self-service kiosks)	N/A	N/A	613,882	80 sqm - 125 sqm @ 1.6 sqm/person	3-7 mins	658,963	100 sqm - 200 sqm @ 1.8 sqm/person	3-7 mins	748,202	130 sqm - 400 sqm @ 1.8 sqm/person	3-7 mins
Departure – CBS and baggage make-up area	280 sqm (total area)	N/A	613,882	300 sqm - 400 sqm	N/A	658,963	350 sqm - 450 sqm	N/A	748,202	400 sqm - 500 sqm	N/A
Departure – Security control	360 sqm (total area)	5-15 mins (estimate)	613,882	250 sqm - 470 sqm @ 1.1	5-10 mins	658,963	300 sqm - 580 sqm @ 1.2	5-10 mins	748,202	400 sqm - 820 sqm @ 1.2	5-10 mins

Terminal Sub-Systems	Current Space AND Maximum Waiting Times		Annual passenger movements (5 Year)	Optimum Space AND Maximum Waiting Times Based on 5 Year Peak Demand		Annual passenger movements (10 Year)	Optimum Space AND Maximum Waiting Times Based on 10 Year Peak Demand		Annual passenger movements (20 Year)	Optimum Space AND Maximum Waiting Times Based on 20 Year Peak Demand	
and screening				sqm/person			sqm/person			sqm/person	
Departure – Departure lounge (excluding retail and concession)	475 sqm (total area)	N/A	613,882	Total 450 sqm - 680 sqm 350 sqm - 530 sqm of seating @ 2.1 sqm (70% to be seated) 100 sqm - 150 sqm standing space @ 1.4 sqm (30% standing)	N/A	658,963	Total 620 sqm - 900 sqm 450 sqm - 650 sqm seating space @ 2.2 sqm (70% to be seated) 170 sqm - 250 sqm standing space @ 1.5 sqm (30% standing)	N/A	748,202	Total 760 sqm - 1,130 sqm 580 sqm - 870 sqm seating space @ 2.2 sqm (70% to be seated) 180 sqm - 260 sqm standing space @ 1.5 sqm (30% standing)	N/A
Departure – Departure gate (passenger queuing)	See Departure Lounge area	5-30 mins (estimate)	613,882	100 sqm - 220 sqm @ 1.1 sqm/person	5-20 mins	658,963	160 sqm - 310 sqm @ 1.2 sqm/person	5-20 mins	748,202	210 sqm - 400 sqm @ 1.2 sqm/person	5-20 mins
Arrival – Baggage claim	390 sqm (total area)	N/A	613,882	350sqm - 430 sqm @ 1.6	N/A	658,963	400 sqm - 600 sqm @ 1.7	N/A	748,202	550 sqm – 850 sqm @ 1.7	N/A

Terminal Sub-Systems	Current Space AND Maximum Waiting Times		Annual passenger movements (5 Year)	Optimum Space AND Maximum Waiting Times Based on 5 Year Peak Demand		Annual passenger movements (10 Year)	Optimum Space AND Maximum Waiting Times Based on 10 Year Peak Demand		Annual passenger movements (20 Year)	Optimum Space AND Maximum Waiting Times Based on 20 Year Peak Demand	
area				sqm/person			sqm/person			sqm/person	
Arrival – Baggage claim presentation	30 m	0-20 mins (estimate)	613,882	65 m - 80 m	0-15 mins	658,963	70 m – 90 m	0-15 mins	748,202	85 m – 110 m	0-15 mins
Arrival – Car rentals	90 sqm (total area)	0-25 mins (estimate)	613,882	100 sqm - 150 sqm @ 1.6 sqm/person	0-15 mins	658,963	150 sqm - 200 sqm @ 1.7 sqm/person	0-15 mins	748,202	200 sqm - 250 sqm @ 1.7 sqm/person	0-15 mins
Arrival – Kerb pick-up	75 m (total length for both drop-off and arrival)	2-15 mins (estimate)	613,882	60 m - 125 m *Excluding buses	2-5 mins	658,963	80 m - 150 m *Excluding buses	2-5 mins	748,202	110 m - 220 m *Excluding buses	2-5 mins

Refer to **Drawing 103** in **Appendix D** for further information regarding the Terminal facilities.

4.9.4 Departures – Check-in area

The check-in area currently accommodates eight conventional check-in facilities. With the rise in passenger numbers and increased passenger processing times, the overall passenger processing system will continue to evolve through adopting technology and moving away from the 'traditional' passenger check-in and baggage acceptance.

Issuing of boarding passes (electronically) and the use of common-use bag tags, is currently progressing towards remote applications, giving more control and choice to the passenger in the future and reducing bag processing times.

In the short to medium term, common user self-check kiosks and common user bag drop-off stations should be integrated into the check-in area, resulting in reduced space demand and minimising wait times.

Refer to **Drawing 103** in **Appendix D** for further details.

4.9.5 Departures – CBS and baggage make-up area

The existing area available for the CBS and baggage make-up area are under-provided for the existing operations. The current CBS and baggage make-up area configuration should be expanded to the north and west, allowing for a larger and longer bag make-up loop. The expanded CBS and the baggage make-up area with additional conveyors can also introduce a two-lane, one-way circuit with more space, resulting in increased efficiency and operations. Depending on whether power-in/power-out aircraft operations are maintained on the RPT Apron in the long term, the expansion of the CBS and baggage make-up area will need to future-proofed.

In the future, the OOG bags can be automatically loaded onto the metering conveyor and integrated with the check-in conveyor prior to the CBS.

Refer to **Drawing 103** in **Appendix D** for further details.

4.9.6 Departures – Screening and security

Based on the current Terminal layout, there is only sufficient space for one entry point into the existing two screening lanes, which lead into the departures lounge. The corridor adjacent to the check-in area has insufficient space to accommodate both the security equipment and passenger processing.

Providing additional space at the screening and security point could allow for additional walk-through metal detectors, full-body scanner, carry-on bag X-ray machine with associated divest tables and roller beds (i.e. with the potential to duplicate the screening and security point). This includes the provision of a more comfortable interrogation area and security staff area/office in the short term.

Refer to **Drawing 103** in **Appendix D** for further details.

It is anticipated that introducing advanced screening technologies over the planning horizon will enable passengers to move to the departures lounge with minimal inconvenience.

4.9.7 Departures – Departure lounge and departure gates

The departure lounge and departure gate area are currently under-provided, with passenger congestion and crowding experienced due to simultaneous RPT services. It should be noted that increased RPT operation frequency in the future may result in greater congestion.

Improving the space for passengers to circulate, stand and sit is an important component of the travel experience. For example, IATA ADRM recommends that 50%-70% of the available space should be used for passenger seating.

Providing additional space and common user departure gates with queuing will ensure that passenger circulation is

not impeded within the departure lounge.

Additional passenger spaces (i.e. desks, family area etc.), toilets, retail and concession outlets will also improve the travel experience, ideally with natural light and external views facing the RPT Apron.

Refer to **Drawing 103** in **Appendix D** for further details.

4.9.8 Arrivals – Baggage claim area and facilities

The baggage claim area and facilities are currently under-provided. The current baggage collection system is generally satisfactory in terms of safety, security and operations, however at peak times, congestion is experienced airside when manoeuvring baggage barrows, and landside passengers experience congestion within the baggage reclaim area due to the available space.

The current presentation length of the baggage reclaim unit is restricted due to available space. It will be necessary to expand the baggage reclaim unit to the east in the future and improve passenger flow and circulation. An increase in RPT operation frequency will result in greater congestion in the baggage claim area.

Providing additional space, will ensure that passenger circulation is not impeded around the baggage reclaim unit. Additional passenger spaces (i.e. desks, seating etc.), toilets, retail and concession outlets could also improve the travel experience, ideally with natural light and external views facing the RPT Apron.

Refer to **Drawing 103** in **Appendix D** for further details.

4.10 Landside – Ground transport

4.10.1 Short-term and long-term car park space demand

For context, and without any current detailed car park data (i.e. car counts, car park dwelling times etc.), the car park space demand and car park space shortfall for 5 year is based on the following:

- Estimated car park space shortfalls are based on the current car park layout and the car park designation (i.e. short-term (general), short-term (premium) etc.) with 613,882 annual passengers in 2026/27
- The average and maximum car park space occupancy number has been used to account for the worst-case scenario based on 613,882 annual passengers in 2026/27; and
- Assuming that the staff and previous long-term car park (now repurposed as short-term (premium) car park) have not been seasonality adjusted.

As such, any car park space shortfall identified below, can be addressed by providing either additional short-term or long-term car park spaces.

The 5 year car park space demand and car park space shortfall are presented in **Table 17**.

Table 17: 5 year car park space demand and car park space shortfall at BBGA

Facility	Previous (2019) Car Park Supply	Current (2022) Car Park Supply	Estimated Car Park Space Demand		Estimated Car Park Space Shortfall		Estimated Combination of All Car Park Spaces	
			Average Occupancy	Maximum Occupancy	Average Occupancy	Maximum Occupancy		
Short-term (general) car park	155	225	119	134	- 106	- 91	18	The car park space demand is 18 more than the supply
Previous long-term car park, now repurposed as short-term (premium) car park	154	112	218	221	106	109		
Car rental car park	176	157	185	200	28	43	43	The car park space demand is 43 more than the supply
Staff car park	52	54	34	39	- 20	- 15	- 15	The car park space demand is 15 less than supply
Total	**537**	**548**					**46**	**Overall, the shortfall of car park spaces is 46 based on the maximum occupancy**

As shown in **Table 17**, the average and maximum car park space occupancy have been estimated for 2027 (5 year). The short-term (general) car park and staff car park occupancy estimates are below the supply by 91 and 15 car park spaces, respectively. The short-term (premium) car park and the car rental car park have estimated car park space shortfalls of 109 and 43 spaces, respectively.

Considering that the short-term (general) car park and the short-term (premium) car park can potentially share car parking spaces, the supply and demand have been combined. When combined, there is an estimated shortfall of 18 car park spaces (i.e. the estimated available supply below the demand).

Overall, the estimated car park space supply is expected to have a shortfall of 46 car park spaces during the maximum car park space occupancy period in 2027 if the car park spaces are shared.

For context, and without any current detailed car park data (i.e. car counts, car park dwelling times etc.), the car park space demand and car park space shortfall for 10 year is based on the following:

- Estimated car park space shortfalls are based on the current car park layout and car park designation (i.e. short-term (general), short-term premium etc.) with 658,963 annual passengers in 2031/32
- The average and maximum car park space occupancy numbers have been used to account for the worst-case scenario based on 658,963 annual passengers in 2031/32; and
- Assuming that the staff and previous long-term car park (now repurposed as short-term premium car park) have not been seasonality adjusted.

As such, any car park space shortfall identified below, can be addressed by providing either additional short-term or long-term car park spaces.

The 10 year car park space demand and car park space shortfall are presented in **Table 18**.

Table 18: 10 year car park space demand and car park space shortfall at BBGA

Facility	Previous (2019) Car Park Supply	Current (2022) Car Park Supply	Estimated Car Park Space Demand		Estimated Car Park Space Shortfall		Estimated Combination of All Car Park Spaces	
			Average Occupancy	Maximum Occupancy	Average Occupancy	Maximum Occupancy		
Short-term (general) car park	155	225	129	144	- 96	- 81	45	The car park space demand is 45 more than the supply
Previous long-term car park, now repurposed as short-term (premium) car park	154	112	235	238	123	126		
Car rental car park	176	157	199	215	42	58	58	The car park space demand is 58 more than the supply
Staff car park	52	54	36	42	- 18	- 12	- 12	The car park space demand is 12 less than supply
Total	**537**	**548**					**91**	**Overall, the shortfall of car park spaces is 61 based on the maximum occupancy**

As illustrated in **Table 18**, the average and maximum car park space occupancy have been estimated for 2032 (10 year). The short-term (general) car park and staff car park occupancy estimates are below the supply by 81 and 12 spaces, respectively. The short-term (premium) car park and the car rental car park have car park space shortfalls of 126 and 58, respectively.

Considering that the short-term (general) car park and the short-term (premium) car park can potentially share car parking spaces, the supply and demand have been combined. When combined, there is an estimated shortfall of 45 car park spaces (i.e. the estimated available supply below the demand).

Overall, the estimated car park space supply is expected to have a shortfall of 91 car park spaces during the maximum occupancy period in 2032 if the car parking spaces are shared.

For context, and without any current detailed car park data (i.e. car counts, car park dwelling times etc.), the car park space demand and car park space shortfall for 20 year is based on the following:

- Estimated car park space shortfalls are based on the current car park layout and car park designation (i.e. short-term (general), short-term premium etc.) with 748,202 annual passengers in 2041/42
- The average and maximum car park space occupancy number has been used to account for the worst-case scenario based on 748,202 annual passengers in 2041/42; and
- Assuming that the staff and previous long-term car park (now repurposed as short-term premium car park) have not been seasonality adjusted.

As such, any car park space shortfall identified below, can be addressed by providing either additional short-term or long-term car park spaces.

The 20 year car park space demand and car park space shortfall are presented in **Table 19**.

Table 19: 20 year car park space demand and car park space shortfall at BBGA

Facility	Previous (2019) Car Park Supply	Current (2022) Car Park Supply	Estimated Car Park Space Demand		Estimated Car Park Space Shortfall		Estimated Combination of All Car Park Spaces	
			Average Occupancy	Maximum Occupancy	Average Occupancy	Maximum Occupancy		
Short-term (general) car park	155	225	149	168	- 76	- 57	108	The car park space demand is 108 more than the supply
Previous long-term car park, now repurposed as short-term (premium) car park	154	112	273	277	161	165		
Car rental car park	176	157	232	250	75	93	93	The car park space demand is 93 more than the supply
Staff car park	52	54	42	49	-12	- 5	- 5	The car park space demand is 5 less than supply
Total	**537**	**548**					**196**	**Overall, the shortfall of car park spaces is 196 based on the maximum occupancy**

As shown in **Table 19**, the average and maximum car parking occupancy have been estimated for the year 2042 (20 year). The short-term (general) car park and staff car park occupancy estimates are below the supply by 57 and 5 spaces, respectively. The short-term (premium) car park and the car rental car park estimates have car park space shortfalls of 165 and 93 spaces, respectively.

Considering that the short-term (general) car park and the short-term (premium) car park can potentially share car parking spaces, the supply and demand have been combined. When combined, there is an estimated car park space shortfall of 108 spaces (i.e. the estimated available supply below the demand).

Overall, the estimated car park space supply is expected to have a shortfall of 196 spaces during the maximum car park space occupancy period in 2042 if the car parking spaces are shared.

4.10.2 Short-term parking

As the passenger numbers increase, short-term and long-term parking should be segregated. This will provide an orderly parking arrangement, with the short-term passengers being guided to the appropriate area where they are more likely to find convenient parking spaces.

With the continual advancement in ground transport systems and technology, it is anticipated that BBGA will need to be flexible in developing or adopting ‘smart parking’ systems, driver biometrics or low or zero-emission vehicles, for example, within the 2022 LUP horizon.

It is envisaged that car rental car parks may be relocated off-site within the 2022 LUP horizon.

Refer to **Section 4.10.1** for more details.

Refer to **Drawing 104** in **Appendix E** for further details.

4.10.3 Long-term parking

As the passenger numbers increase, short-term and long-term parking should be segregated. With the continual advancement in ground transport systems and technology, it is anticipated that BBGA will need to be flexible in developing or adopting ‘smart parking’ systems, driver biometrics or low or zero-emission vehicles, for example, within the 2022 LUP horizon.

Refer to **Section 4.10.1** for more details.

Refer to **Drawing 104** in **Appendix E** for further details.

4.10.4 Bus stops, taxis and rideshare

Bus stops, taxis and rideshare provide important access to the Terminal.

In the future, the shuttle bus, taxi, and ride-share area for passenger drop-off and pick-up will likely remain separate from private vehicle passenger drop-off and pick-up lanes by using technology. The capacity of the bus stops, taxis and rideshare areas will need to be reassessed in conjunction with the proposed Terminal expansion.

In the short to medium term, registered driver identification or vehicle number plate recognition technology should be used or similar, with passengers being dropped off or picked up closer to the Terminal. The registered driver identification or vehicle number plate recognition could be recorded upon entry to the drop-off and pick-up lanes.

The public bus service should be integrated with the shuttle bus, taxi and ride-share area, with passengers being dropped off or picked up closer to the Terminal.

Refer to **Drawing 104** in **Appendix E** for further details.

4.10.5 Access and curb presentation

In the future, the private vehicle passenger drop-off and pick-up will likely remain separate from the shuttle bus, taxi, and ride-share for passenger drop-off and pick-up lanes by using technology.

The private vehicle departure drop-off zones and arrivals pick-up zone tend to congest the area during peak hours. Therefore, deploying dedicated enforcement officers may be needed to achieve a high turnover rate in conjunction with appropriate signage (i.e. time restriction signage etc.). It is also recommended that signage or verbal announcements advising drivers not to leave their vehicle unattended be introduced.

It is envisaged that the short-term (premium) car park, short-term (general) car park, long-term car park and rental car parks will remain with access by foot via pedestrian paths. Rental car parks may be relocated off-site within the 2022 LUP horizon.

Access to the public bus, shuttle bus, taxi and ride-share lanes will likely be as close as practical to the Terminal.

For further details regarding LoS for the estimated length of the curb presentation, please refer to **Section 4.9.3**.

Refer to **Drawing 104** in **Appendix E** for further details.

4.10.6 Active transport

Active transport involves physical activity such as walking or bicycle riding. In the future, allowance should be made for bicycle riding during the 2022 LUP horizon with the provision of a bike parking area for staff/employees.

At this stage, external pedestrian walkways will likely not be utilised due to the industrial business catchment surrounding the airport precinct.

4.10.7 Forecourt

It is envisaged that planning and developing a dedicated forecourt will improve passenger circulation, passenger transfers, security, and enhance the passenger experience within the 2022 LUP horizon.

5. 2022 Land Use Plan

5.1 2022 Land Use Plan objectives and strategy

Whilst the planning strategy of the 2022 LUP is appropriate at the time of its development, it needs to be frequently reviewed and updated to maintain flexibility to cater for future changes in response to the dynamic aviation industry.

As such, the following strategy principles have been adopted:

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

As determined from discussions with BSC representatives and stakeholders during this commission, the key operational and functional requirements have been incorporated in preparing this 2022 LUP as far as practicable.

Adopting this 2022 LUP does not represent a commitment by BSC to provide the facilities described, adhere to the facility locations and dimensions, or follow the time scales as documented in the 2022 LUP. Additionally, promulgating the 2022 LUP does not obviate the requirement to evaluate and justify specific developments when they are proposed in detail.

5.2 Indicative budget capital cost estimates

5.2.1 Capital works

A series of future ultimate concept plans have been developed for the 2022 LUP based on the existing information reviews and studies and consultation (refer to **Appendices B** to **E**), which can be used as the general benchmark going forward.

The strategy principles for capital works have identified various assets requiring replacement as well as some new capital works projects. BBGA's future development must be adequately accommodated for the forecast growth and appropriately safeguarded from inappropriate development within the airport precinct, while providing flexibility and ensuring that ecological, environmental and Aboriginal heritage has been addressed.

5.2.2 Basis of indicative budget capital cost estimates

Indicative budget capital cost estimates should be only considered a first cost indication (at current prices at the date stated) and are provided based on an outline estimate of BSC's needs; prepared by reference to feasibility sketches or assessed without sketches (in some instances) and based on pitt&sherry's knowledge of costs for similar projects.

The indicative budget capital cost estimates have been prepared without the benefit of detailed design and without detailed consideration of survey, geometry, drainage, existing services or other local information. The indicative budget capital cost estimate is intended only as a guide for pre-feasibility and planning purposes; it is not an estimate and may not be quoted as such.

The indicative budget capital cost estimates are prepared using broad cost parameters (e.g. earthworks and pavements on a cost per square metre basis). Since pitt&sherry has no control over the cost of labour, materials, equipment or services furnished by others, or over Contractor's methods of determining prices, or over competitive bidding or market conditions, the indicative budget capital cost estimates have been provided based only on our experience and represent pitt&sherry's judgement as experienced and qualified professional engineers. pitt&sherry cannot and does not, however, guarantee that proposals, bids or actual construction costs will not vary from our indicative budget capital cost estimates.

No allowance has been made for staging the airside or landside works.

No allowance has been made for BSC's project contingencies, project management fees, consultant fees and third-party approval fees or other studies and investigations that may be required.

The indicative budget capital cost estimates are based on $AUD in 2022.

The indicative budget capital cost estimates are generally based on construction costs (based on a study or investigation) and include an estimation of:

- Preliminaries such as Contractor site establishment and disestablishment, Contractor site administration, Contractor quality assurance and environmental management, maintenance of site access roads, surveying and supply of as-built drawings for example
- Pavement excavation and earthworks and subgrade preparation, including cartage and compaction and proof rolling
- Pavement construction (i.e. asphalt, prime, concrete, waterproof, base and sub-base course material etc.)
- Pavement construction from local imported materials only with inclusion for haulage from a local source (less than 50 km from the airport)
- Select fill material for subgrade replacement from local imported materials
- Stormwater drainage (i.e. open unlined drains, some concrete pipes and limited subsurface drainage etc.)
- Electrical power supply upgrades only for AGL (i.e. transformer and underground mains with pits etc.)
- Aerodrome lighting (including lighting equipment room refurbishment, lighting control panel, stand-by diesel generator, Runway, Taxiway and Apron light fittings, cables/conduits, SITs, SIT pits and precast pits etc.)
- Line marking
- Provisional items estimate, such as subgrade replacement and topsoiling of disturbed areas
- Relocation of facilities is based on 'like for like' with no upgrades to the existing facilities; and
- Terminal building works based on maintaining the existing structure and adding elements to the existing structure only.

The indicative budget capital cost estimates specifically exclude an estimation of:

- Importing pavement materials or select fill material for subgrade replacement from a remote site or location not in close proximity to the proposed works site
- Disposal of cut material from site which may not be suitable for use as general fill-in flanks or open drains on site
- Costs associated with delays as a result of inclement weather during construction
- Costs associated with new infrastructure and services not stated herein
- Costs associated with upgrades to existing infrastructure and services not stated herein (including buildings, roads, communications, sewerage, water and gas)
- Costs associated with future pavement, drainage, lighting or infrastructure expansion not stated herein

- Costs associated with any airport boundary fencing and security control
- Costs associated with any restrictions to airport operations during construction
- Costs associated with structures (excluding the passenger Terminal), such as GA hangars, functional hangars with minimum fit-out and the FBO terminal
- Costs associated with any aircraft operational matters, including:
    - Take-off and approach tracks
    - GPS approaches
    - Noise and noise abatement procedures
    - Navigational aids (not stated herein)
    - Obstacle Limitation Surfaces
- Costs associated with the potential development or redevelopment of airside areas in the future; and
- Costs associated with any additional statutory, regulatory, planning or environmental requirements associated with potential development.

5.2.3 Pre-construction activities

It is envisaged that there will be a need for a range of pre-construction activities to take place prior to the commencement of any works on site. Some of the necessary pre-commencement activities may include:

- Liaising with Federal and State Governments to determine funding opportunities
- Undertaking necessary studies, investigations and detailed design to assist with Government and authority approvals, as well as funding applications
- Community and stakeholder consultation
- Environmental and heritage investigations
- Government and authority approval process
- Liaison with CASA and AsA
- Liaison with likely aircraft operators
- Tendering the Works
- Material procurement, such as aggregates for pavement construction and long lead time items, such as airport lighting cabling and navigational aids
- Site establishment; and
- Bulk earthworks.

5.2.4 Project delivery method

A contracting and execution strategy that meets operational, budget, quality and program requirements of BSC needs to be developed.

There are a number of possible delivery strategies that influence the time, cost and quality of project outcomes. There are obviously many variables, combinations and influencing factors but in short, a Design and Construct (D&C) approach is likely to produce overall time advantages, Early Contractor Involvement (ECI) is likely to have an influence on cost, and a conventional (traditional) approach (design, tender and construct) and is likely to have the greatest influence on construction quality.

For airside works, a combination with the conventional approach, when coupled with ECI can be adopted to leverage

a lower overall cost (and possibly minimise the program).

5.2.5 5 year indicative budget capital cost estimate

Table 20 summarises the indicative budget capital cost estimate for the ultimate airside layout concept plan for the FY2026/27 (5 year).

Table 20: 5 year – Ultimate airside layout concept plan

Facility	Indicative Budget Capital Cost Estimate
Potential plan, design and upgrade the existing Bay 1	$7.5M to $15M*
Potential plan, design and upgrade the existing Bay 3 and Bay 4	
Potential plan, design and construct new Bay 5	

*Excludes the cost of the potential future air traffic control tower and the relocation of the BoM weather station (by others).

Refer to **Drawing 101** in **Appendix B** and **Drawing 102** in **Appendix C** for further details, noting the 5 year stage is not explicitly illustrated.

Table 21 summarises the indicative budget capital cost estimate for the ultimate Terminal concept plan for the FY2026/27 (5 year).

Table 21: 5 year – Ultimate Terminal concept plan

Facility	Indicative Budget Capital Cost Estimate
Potential plan, design and upgrade and relocate the departures check-in desks and conveyors	$3M to $6M
Potential plan, design and upgrade and relocate the CBS machine and conveyors	
Potential plan, design and new departures baggage make-up area and conveyors	

Refer to **Drawing 103** in **Appendix D** for further details, noting the 5 year stage is not explicitly illustrated.

5.2.6 10 year indicative budget capital cost estimate

Table 22 summarises the indicative budget capital cost estimate for the ultimate airside layout concept plan for the FY2031/32 (10 year).

Table 22: 10 year – Ultimate airside layout concept plan

Facility	Indicative Budget Capital Cost Estimate
Potential demolish and relocate the existing IWDI and signal circle, existing GA hangars and existing BoM weather station	$16M to $32M*
Potential plan, design and construct new taxiways	

*Excludes the cost of new buildings and structures, including hangars (for example).

Refer to **Drawing 101** in **Appendix B** and **Drawing 102** in **Appendix C** for further details, noting the 10 year stage is not explicitly illustrated.

Table 23 summarises the indicative budget capital cost estimate for the ultimate General Aviation concept plan for the FY2031/32 (10 year).

Table 23: 10 year – Ultimate General Aviation concept plan

Item	Indicative Budget Capital Cost Estimate
Ultimate General Aviation concept plan	$18M to $36M*

*Excludes the cost of new buildings and structures and other facilities, such as hangars and aviation fuel storage (for example).

Refer to **Drawing 102** in **Appendix C** for further details.

Table 24 summarises the indicative budget capital cost estimate for the ultimate airside layout concept plan – RPT Apron expansion for the FY2031/32 (10 year).

Table 24: 10 year – Ultimate airside layout concept plan – RPT Apron expansion

Item	Indicative Budget Capital Cost Estimate
Ultimate airside layout concept plan – RPT Apron expansion	Nil (completed in 5 year)

Refer to **Drawing 101** in **Appendix B** and **Drawing 102** in **Appendix C** for further details, noting the 10 year stage is not explicitly illustrated

Table 25 summarises the indicative budget capital cost estimate for the ultimate Terminal concept plan for the FY2031/32 (10 year).

Table 25: 10 year – Ultimate Terminal concept plan

Facility	Indicative Budget Capital Cost Estimate
Potential plan, design and construct new security area expansion	$0.5M to $1M*

*Excludes the cost of engineering services and upgrades, such as water, gas and electricity (for example).

Refer to **Drawing 103** in **Appendix D** for further details, noting the 10 year stage is not explicitly illustrated.

5.2.7 20 year indicative budget capital cost estimate

Table 26 summarises the indicative budget capital cost estimate for the ultimate airside layout concept plan for the FY2041/42 (20 year).

Table 26: 20 year – Ultimate airside layout concept plan

Facility	Indicative Budget Capital Cost Estimate
Potential plan, design and construct new runway extension	$7.5M to $15M
Potential plan, design and construct new taxiways	

Refer to **Drawing 101** in **Appendix B** and **Drawing 102** in **Appendix C** for further details, noting the 20 year stage is not explicitly illustrated

Table 27 summarises the indicative budget capital cost estimate for the ultimate airside layout concept plan – RPT Apron expansion for the FY2041/42 (20 year).

Table 27: 20 year – Ultimate airside layout concept plan – RPT Apron expansion

Item	Indicative Budget Capital Cost Estimate
Ultimate airside layout concept plan – RPT Apron expansion	$12M to $24M

Refer to **Drawing 101** in **Appendix B** and **Drawing 102** in **Appendix C** for further details, noting the 20 year stage is not explicitly illustrated

Table 28 summarises the indicative budget capital cost estimate for the ultimate Terminal concept plan for the FY2041/42 (20 year).

Table 28: 20 year – Ultimate Terminal concept plan

Facility	Indicative Budget Capital Cost Estimate
Potential plan, design and construct new departure lounge expansion	
Potential plan, design and construct new departure gate expansion	
Potential plan, design and construct new retail/concessions	
Potential plan, design and construct new toilets	$13M to $26M*
Potential plan, design and construct new baggage claim area	
Potential plan, design and construct new baggage make-up area	
Potential plan, design and construct new car rental area	

*Excludes the cost of engineering services and upgrades, such as water, gas and electricity (for example).

Refer to **Drawing 103** in **Appendix D** for further details, noting the 20 year stage is not explicitly illustrated.

6. Next steps

6.1 Actions to support the implementation of the Land Use Plan

6.1.1 Capital program and delivery

The primary aims of the capital program and delivery includes the following:

- Establish a governance process for each airside and landside project
- Ensure that each project seamlessly moves through the funding, planning, design, construction and commissioning stages
- Provide a transparent process to those affected by the relevant project
- Manage the expectations of the project outcomes
- Increase clarity to ensure the project provides the best outcome for BSC, stakeholders and the community
- Increase stakeholder and community buy-in and promote the alignment of the individual project objectives
- Continue to identify, assess and manage the associated risk for each project; and
- Annual review of development strategies and future plans, ensuring that the project objectives are current and remain relevant.

6.1.2 Planning amendments

At the time of writing the 2022 LUP, there were no proposed planning amendments. However, the NSW planning framework and BSC IPR framework are subject to constant change and may impose additional requirements during the planning horizon.

6.1.3 Development of future plans and strategies

A series of future ultimate concept plans have been developed for the 2022 LUP based on the existing information reviews and studies (refer to **Appendices B** to **E**), which can be used as the general benchmark going forward.

BBGA's future development must be adequately accommodated for the forecast growth and be appropriately safeguarded from inappropriate development within the airport precinct, while providing flexibility and ensuring that ecological, environmental and Aboriginal heritage has been addressed.

Adopting this 2022 LUP does not represent a commitment by BSC to provide the facilities described, adhere to the facility locations and dimensions, or follow the time scales as documented in the 2022 LUP. Additionally, promulgating the 2022 LUP does not obviate the requirement to evaluate and justify specific developments when they are proposed in detail.

6.1.4 Stakeholder consultation

Ongoing consultation with key stakeholders and the community will be vital to realise the proposed development strategies and future plans for BBGA.

6.1.5 Planning reviews and studies

As BBGA continues to develop and grow, specific ongoing planning reviews and studies will continue to be part of a vital component regarding ecological, environmental and Aboriginal heritage. Early involvement and flagging the likely statutory requirements are recommended, ensuring that the issue does not become a critical constraint for the individual project.

2022 Land Use Plan

Appendix A

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DRAWING REVISION HISTORY

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CONTRACT TITLE: BALLINA BYRON GATEWAY AIRPORT LAND USE PLAN

STATUS: **PRELIMINARY**

DRAWING TITLE: 2022 LAND USE PLAN

DATUMS: AHD / GDA PLANE

CLIENT No.

DRAWING No. S-P212184-00-APT-DRG-100

REVISION B

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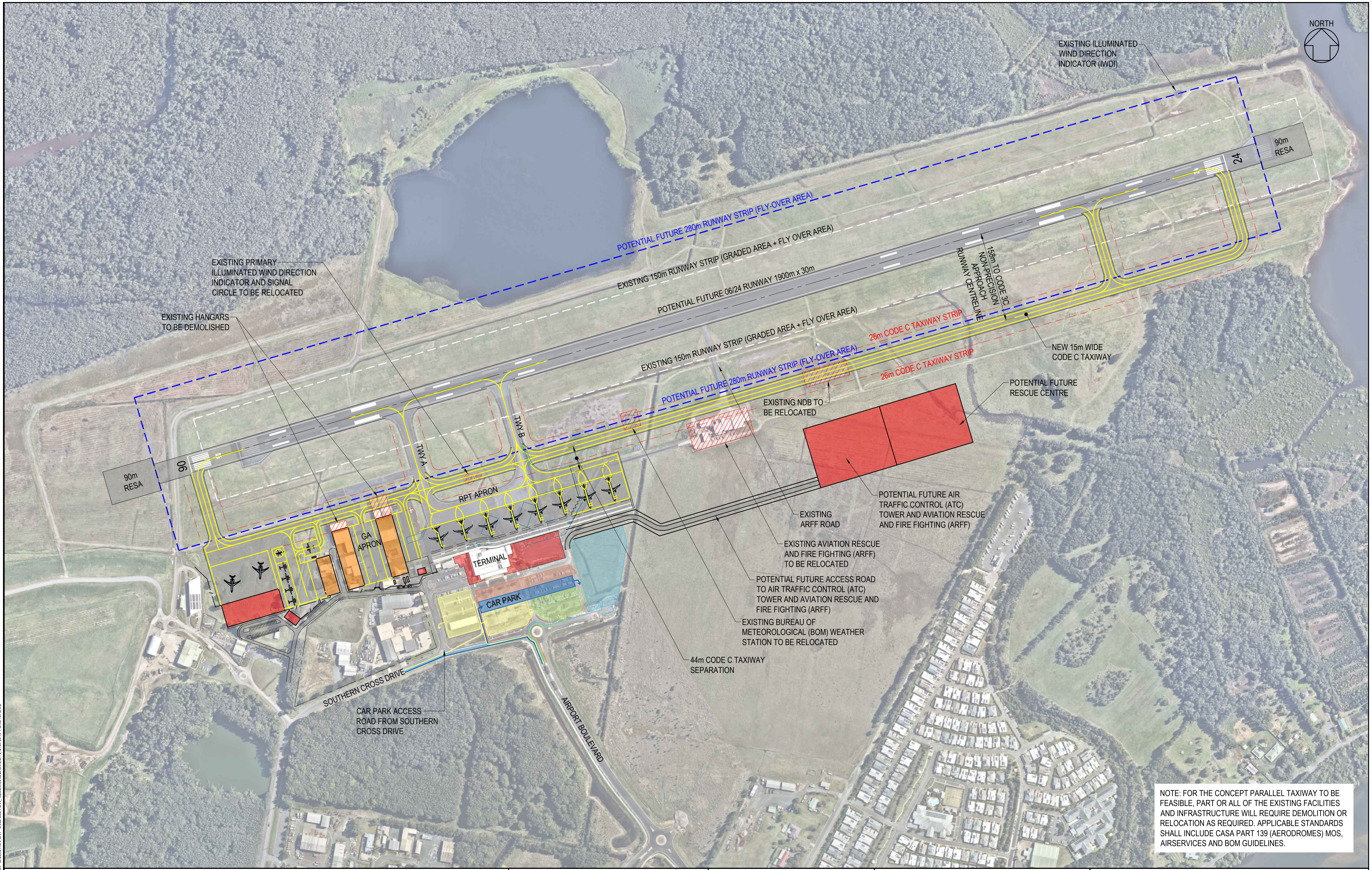
Ultimate Airside Layout Concept Plan

Appendix B



NOTE: FOR THE CONCEPT PARALLEL TAXIWAY TO BE FEASIBLE, PART OR ALL OF THE EXISTING FACILITIES AND INFRASTRUCTURE WILL REQUIRE DEMOLITION OR RELOCATION AS REQUIRED. APPLICABLE STANDARDS SHALL INCLUDE CASA PART 139 (AERODROMES) MOS, AIRSERVICES AND BOM GUIDELINES.

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DATUMS: AHD / GDA PLANE
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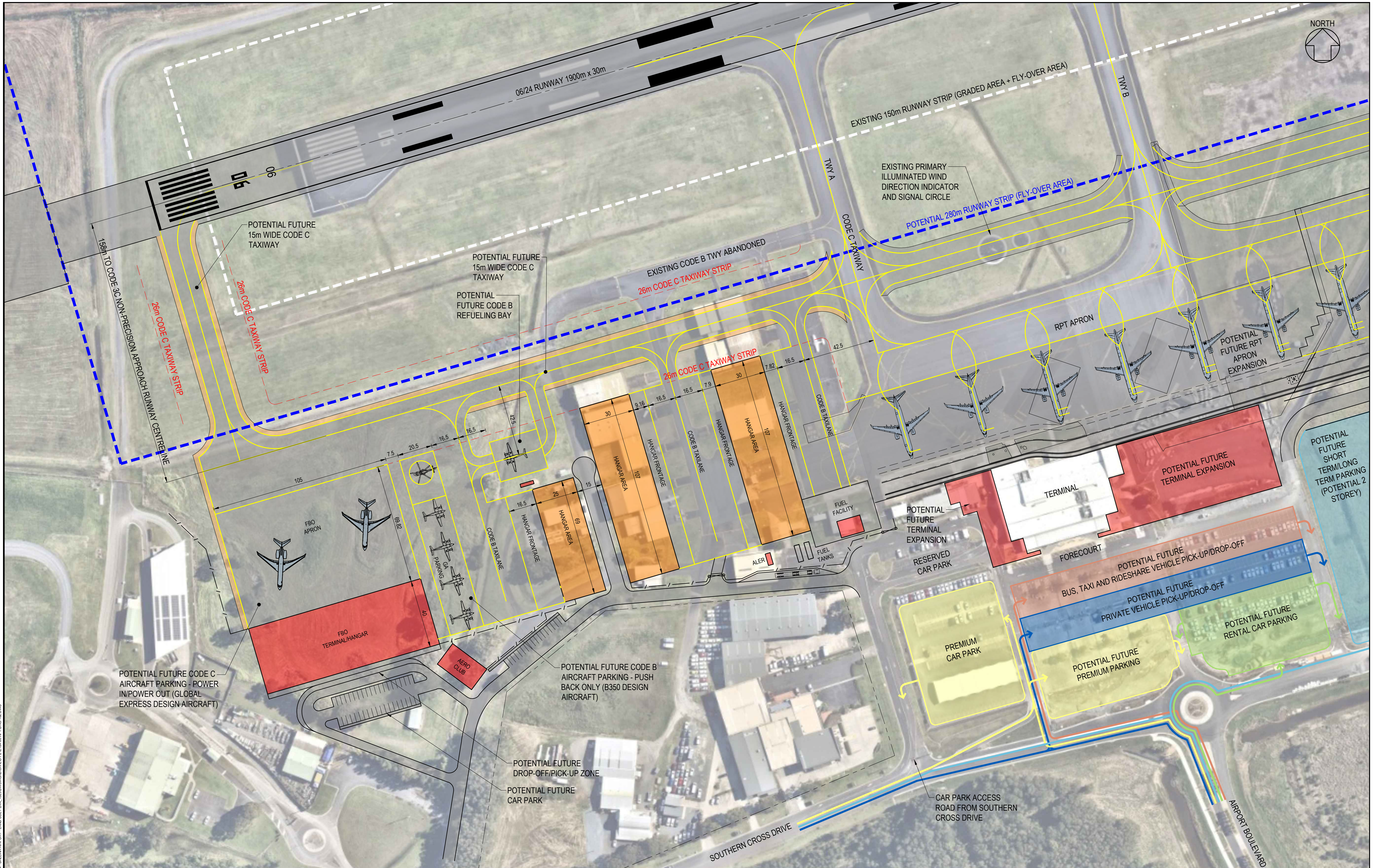
Mar. 17, 23 - 10:07:35 Name: S-P212184-00-APT-DRG-101.dwg

Ultimate General Aviation Concept Plan

Appendix C


NORTH
06/24 RUNWAY 1900m x 30m
EXISTING 150m RUNWAY STRIP (GRADED AREA + FLY-OVER AREA)
TWY B
TWY A
EXISTING PRIMARY ILLUMINATED WIND DIRECTION INDICATOR AND SIGNAL CIRCLE
POTENTIAL 280m RUNWAY STRIP (FLY-OVER AREA)
CODE C TAXIWAY
POTENTIAL FUTURE 15m WIDE CODE C TAXIWAY
158m TO CODE 3C NON-PRECISION APPROACH RUNWAY CENTRELINE
26m CODE C TAXIWAY STRIP
EXISTING CODE B TWY ABANDONED
POTENTIAL FUTURE CODE B REFUELING BAY
RPT APRON
POTENTIAL FUTURE RPT APRON EXPANSION
HANGAR AREA
HANGAR FRONTAGE
CODE B TAXILANE
FBO APRON
GA PARKING
FBO TERMINAL/HANGAR
AERO CLUB
FUEL FACILITY
FUEL TANKS
TERMINAL
POTENTIAL FUTURE TERMINAL EXPANSION
POTENTIAL FUTURE SHORT TERM/LONG TERM PARKING (POTENTIAL 2 STOREY)
FORECOURT
RESERVED CAR PARK
POTENTIAL FUTURE BUS, TAXI AND RIDESHARE VEHICLE PICK-UP/DROP-OFF
POTENTIAL FUTURE PRIVATE VEHICLE PICK-UP/DROP-OFF
POTENTIAL FUTURE RENTAL CAR PARKING
PREMIUM CAR PARK
POTENTIAL FUTURE PREMIUM PARKING
POTENTIAL FUTURE CODE C AIRCRAFT PARKING - POWER IN/POWER OUT (GLOBAL EXPRESS DESIGN AIRCRAFT)
POTENTIAL FUTURE CODE B AIRCRAFT PARKING - PUSH BACK ONLY (B350 DESIGN AIRCRAFT)
POTENTIAL FUTURE DROP-OFF/PICK-UP ZONE
POTENTIAL FUTURE CAR PARK
CAR PARK ACCESS ROAD FROM SOUTHERN CROSS DRIVE
SOUTHERN CROSS DRIVE
AIRPORT BOULEVARD

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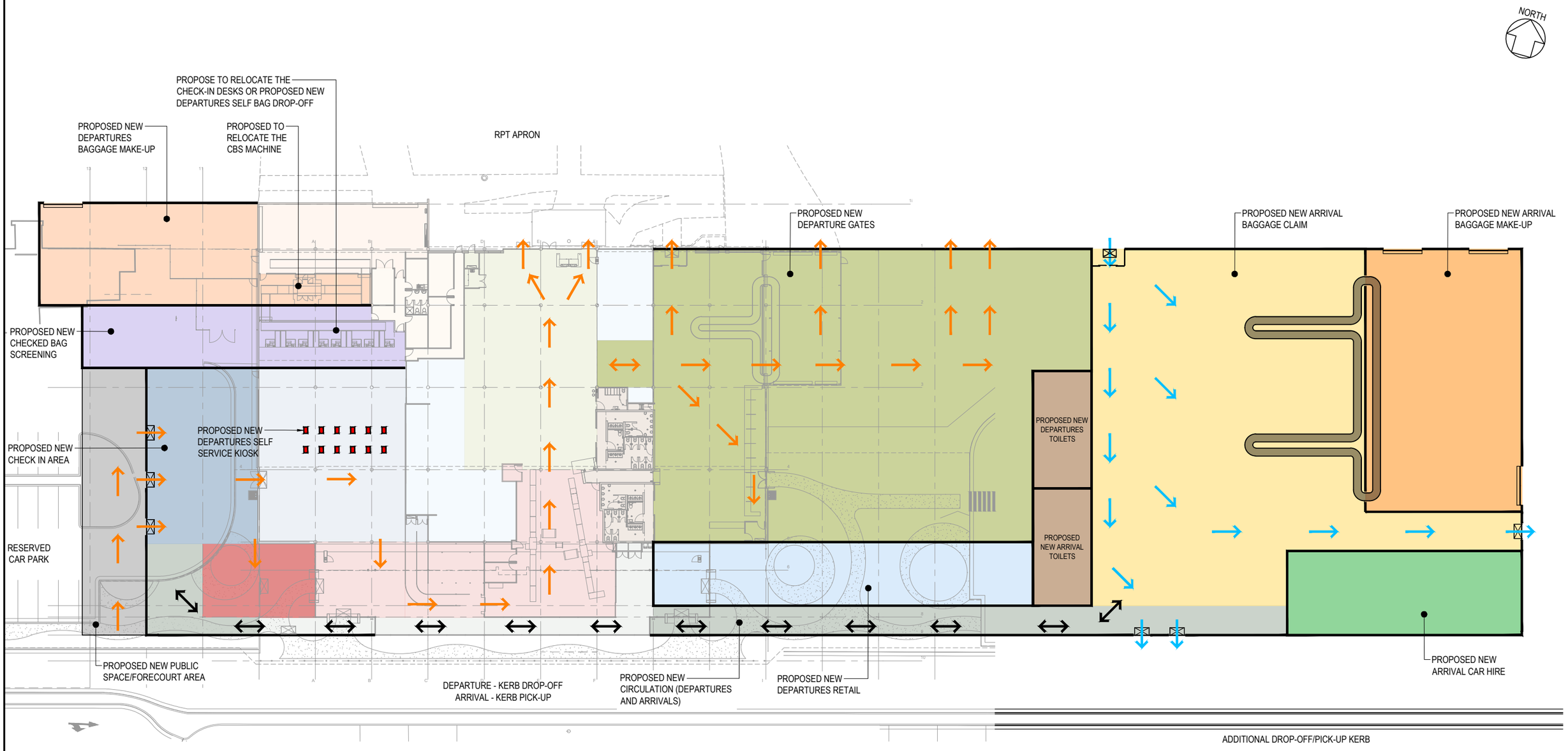
DRAWING No. S-P212184-00-APT-DRG-102 | REVISION B

Mar. 17, 23 - 10:07:23 Name: S-P212184-00-APT-DRG-102.dwg

Ultimate Terminal Concept Plan

Appendix D



LEGEND

- DEPARTURE
- ARRIVAL
- CIRCULATION (DEPARTURE AND ARRIVAL)
- EXISTING DEPARTURE - BAGGAGE MAKE UP AREA
- EXISTING AIRLINE OFFICES
- EXISTING DEPARTURE - CHECK IN AREA
- EXISTING DEPARTURE - SECURITY CONTROL AND SCREENING
- EXISTING CIRCULATION (DEPARTURE AND ARRIVALS)
- EXISTING DEPARTURES - DEPARTURES GATE
- EXISTING TOILETS (DEPARTURE AND ARRIVAL)
- EXISTING DEPARTURE - RETAIL
- RELOCATED AND EXPANDED DEPARTURE - CHECKED BAG SCREENING
- RELOCATED AND EXPANDED DEPARTURE - BAGGAGE MAKE UP AREA
- EXPANDED DEPARTURE - CHECK IN AREA
- EXPANDED DEPARTURE - SECURITY CONTROL AND SCREENING
- EXPANDED CIRCULATION (DEPARTURE AND ARRIVALS)
- EXPANDED DEPARTURES - DEPARTURES GATE
- EXPANDED TOILETS (DEPARTURE AND ARRIVAL)
- EXPANDED DEPARTURE - RETAIL
- RELOCATED AND EXPANDED ARRIVAL - BAGGAGE CLAIM
- RELOCATED AND EXPANDED ARRIVAL - BAGGAGE MAKE UP
- RELOCATED AND EXPANDED ARRIVAL - CAR HIRE

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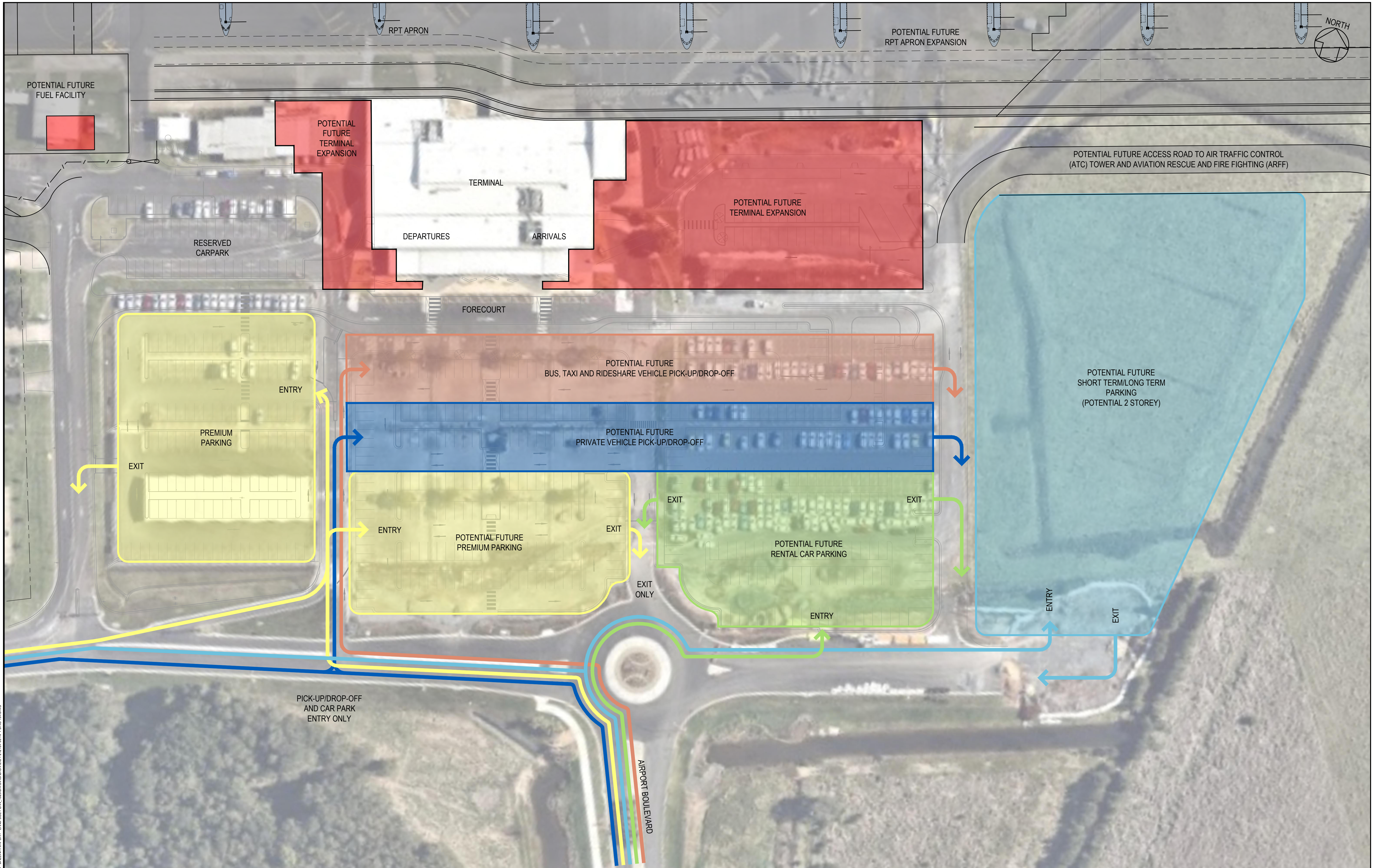
Ultimate Ground Transport Concept Plan

Appendix E



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2022 Land Use Plan

Ballina Byron Gateway Airport

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ABN 67 140 184 309

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Hobart
Launceston
Newcastle
Devonport

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