



BAC focuses on integrated, whole-of-airport planning to ensure operations, facilities and services respond to demand.

Connecting People
Building Opportunities

Chapter 6: Economic
Chapter 7: Operations
Chapter 8: Environment
Chapter 9: Social

PLANNING RESPONSE



ECONOMIC

Brisbane Airport is of significant economic benefit to both the South East Queensland and state economies. Generating jobs, investment and tourism are just some of the contributions the airport makes to the wellbeing and prosperity of the region.

6.1 Economic Significance

ECONOMIC SIGNIFICANCE OF BRISBANE AIRPORT

Brisbane Airport is one of Australia's fastest growing passenger and freight airports and is recognised as a key driver in the long-term growth of the Queensland and Australian economies.

As at March 2014, Brisbane Airport offers direct connections to 28 international and 42 domestic destinations. By 2034 it is estimated Brisbane Airport will directly contribute over \$8.2 billion to the Queensland economy and provide nearly 51,000 full time equivalent jobs. The growth forecast builds on the investments across Brisbane Airport outlined in previous master plans and reinforces the consistent growth in employment opportunities Brisbane Airport attracts.

MAJOR INFRASTRUCTURE INVESTMENT SINCE 2009

The 2009 Master Plan formed the basis of over \$1 billion in infrastructure investment across Brisbane Airport between 2009 and 2014. This investment incorporated a range of aeronautical and non-aeronautical investment across terminal areas and commercial precincts.

Figure 3.1 in Chapter 3 highlights the key investments realised through BAC's business model for investment and underpinned by the 2009 Master Plan. These developments were funded either via the long-standing aeronautical infrastructure funding model or in partnership with key commercial stakeholders.

An outcome of this investment has been a rise in employment across Brisbane Airport of an estimated 5,000 additional full time equivalent employees (FTE) despite industry experiencing the global financial crisis during that five year period.

FRAMEWORK FOR AERONAUTICAL INFRASTRUCTURE FUNDING

Funding for major infrastructure investment at Australian airports is derived from a combination of private funding from the airport lessee company, (in the case of Brisbane Airport, it is BAC), as well as a contribution by airlines in the form of passenger and aeronautical charges, made during the construction and operational phases of that infrastructure. Aeronautical infrastructure (including some terminals, as well as taxiways, aircraft parking bays and major roads) built at Australian privatised airports has been funded using this model.

The current funding model for infrastructure at Australia's airports was adopted in 2002 when the Productivity Commission reviewed pricing arrangements between airports and airlines. This model was again endorsed after subsequent reviews in 2007 and 2012. BAC anticipates that funding of future aeronautical infrastructure outlined in the 2014 Master Plan will continue to be based on this model.

ECONOMIC CONTRIBUTION OF AUSTRALIAN AIRPORTS

Airports are a central component of aviation and in that role enable a range of business and tourism activities. Notably, the major airports around Australia become economic hubs supported by a diverse range of commerce including retail, freight and logistics, and aviation support, to name a few.

It has been estimated that airports nationally contribute \$3.2 billion (2011 dollars) to the Australian economy annually, with approximately 90% of this contribution attributed to the major airports around Australia (Deloitte Access Economics (DAE), 2012).

Brisbane Airport is one of the major airports in Australia and the following sections outline the economic contributions Brisbane Airport will make to the regional, Queensland and Australian economies.

ECONOMIC CONTRIBUTION OF THE 2014 MASTER PLAN

Brisbane Airport is a critical transport and business centre and a gateway for Queensland that facilitates tourism, trade and economic activity across the state. Just 8 km from Brisbane's Central Business District (CBD), and within one to two hour's drive of a number of Queensland's most iconic leisure and business travel destinations, Brisbane Airport enjoys one of the best geographical locations of any Australian capital city airport. It is also the closest Australian capital city airport to many Pacific Island destinations, as well as many Asian ports.

Supporting regional economic growth and employment is one of the primary objectives of Brisbane Airport. Long-term trends in business and leisure travel indicate continued growth. To support the forecast growth in passengers and aircraft, BAC is investing significantly in increased

aviation capacity and airport precinct development to encourage new and continued expansion of industries as well as employment growth.

Brisbane Airport's current and future economic significance and contribution to the region was analysed by DAE for this 2014 Master Plan. Specifically, DAE analysed the economic significance of Brisbane Airport generated from the planned airport expansion and evaluated the airport's contribution to the wider economy.

DAE has estimated that Brisbane Airport and all businesses operating from it directly contributed approximately \$3.3 billion in terms of Gross Value Add (GVA) to the Queensland economy in 2012-13 and this is expected to increase to \$8.3 billion by 2034. Table 6.1 outlines the forecast contributions of Brisbane Airport.

In addition to the value that Brisbane Airport has to the Queensland economy, there are also wider benefits to the Australian economy as a result of the commerce businesses operating on Brisbane Airport generate with other businesses. This has also been assessed by DAE and it has been estimated that the wider contribution Brisbane Airport has had to the

Australian economy in 2012-13 is \$5.3 billion and will grow to \$13.4 billion by 2034. Table 6.2 shows the incremental contribution Brisbane Airport will have to the Australian economy to 2034.

JOBS CREATION

The sustained long-term growth, coupled with the aeronautical and commercial developments at Brisbane Airport over the last decade, have proven to support the economy through consistent employment growth.

The development of aeronautical and commercial assets or infrastructure outlined in the 2009 Master Plan has facilitated growth in jobs at Brisbane Airport by approximately 30% between 2009 and 2014, which is significantly higher than the Queensland average of 5% for the same period.

This significant increase in employment has occurred despite the impacts of the global financial crisis also occurring in this five-year period. DAE has developed the outlook for employment growth at Brisbane Airport which is summarised in Table 6.3.

The key employment sectors for which growth is forecast includes aviation, aviation maintenance and training, commercial, retail and government.

TABLE 6.1: DIRECT ECONOMIC CONTRIBUTION TO QUEENSLAND OF BRISBANE AIRPORT OVER THE MASTER PLANNING HORIZON (2012-13 DOLLARS)

	2012/13	2018/19	2023/24	2028/29	2033/34
Gross Value Added (\$m)	3,296	4,721	6,338	7,362	8,258

Source: DAE, 2013

TABLE 6.2 TOTAL ECONOMIC CONTRIBUTION BRISBANE AIRPORT HAS TO THE AUSTRALIAN ECONOMY (2012-13 DOLLARS)

	2012/13	2018/19	2023/24	2028/29	2033/34
Gross Value Add (\$m)	5,300	7,800	10,290	11,950	13,400

Source: DAE, 2013

TABLE 6.3: OUTLOOK FOR EMPLOYMENT GROWTH AT BRISBANE AIRPORT TO 2034

	2009 Master Plan	2012/13	2018/19	2023/24	2028/29	2033/34
Employees	16,000	21,000	29,450	39,595	45,989	50,592

Source: DAE, 2013



SUPPORTING QUEENSLAND'S ECONOMIC DIRECTION

One of the main drivers of Queensland's economic growth is the growth in population. South East Queensland (SEQ), in particular, is projected to grow from 2.8 million people in 2006 to 4.6 million people in 2031. Also underpinning Queensland's economy are the key sectors of resources and tourism. The decentralised nature of Queensland means that aviation throughout Queensland plays an enabling role for these sectors to contribute to the Queensland economy.

Brisbane Airport is the busiest airport of Queensland's 191 airports or airfields and is considered an airport of strategic economic importance by the Queensland Government Department of State Development, Infrastructure and Planning (DSDIP, 2013). Brisbane Airport, along with other Queensland airports nominated as strategically important, link resource hubs with workforces; leisure travellers with destinations; connect supply chains with markets, and provide employment opportunities across a range of

supporting industries including aviation support and maintenance, training and passenger facilitation.

Queensland's Resource Sector

As a result of its natural resource endowment, Queensland has been one of the major beneficiaries of the mining boom. The resource sector contributes 11% of Gross State Product (GSP) to Queensland. A proportion of the workforce in the resource sector operates on a fly-in fly-out (FIFO) basis. With future expansion of the resource sector expected to occur across Queensland, the growth in FIFO operations is set to continue. Critical to the success of transporting FIFO workforces is for airports to facilitate regular and efficient flights across Queensland. Brisbane Airport performs this critical role in transporting FIFO workforces to regional and remote locations throughout the day and night.

In 2012, it was estimated that there were 64,000 FTE (Qld Resources Council (QRC), 2012) in the mining resource sector throughout Queensland and approximately 8,000 FTE are considered FIFO

1 Fly-in fly-out workers have contributed to the growth in passenger numbers at Brisbane Airport.

passengers each week (Airbiz 2013). The QRC suggests the employment in the resources sector will increase as new projects are constructed by an additional 40,000 FTE by 2020. It is generally understood that new projects in the Galilee Basin in particular, will have a significantly higher proportion of the workforce as FIFO employees rather than local residents.

The key resource areas in Queensland include the Bowen and Galilee Basins, Gladstone and the north west region comprising Mt Isa and Cloncurry. Brisbane Airport connects to each of these regions.

Between 2008 and 2012, the most significant seat capacity growth in intrastate city pairs connecting Brisbane were (Airbiz 2013):

- » Mackay at 9.3% growth
- » Gladstone at 19.9% growth
- » Emerald at 27.8% growth.

The strongest growth in regional towns connecting with Brisbane in 2012 were (Airbiz 2013):

- » Bowen Basin at 55% (Moranbah, Middlemount, Clermont and Blackwater)
- » Surat Region at 33% (Roma, Charleville, Oakey and Toowoomba).

Catering for the increasing demand of FIFO employees, a proportion of FIFO passengers will utilise regular public transport (RPT) flights and the remainder will utilise smaller general aviation aircraft including turboprops and regional jets. Given this, it has been estimated that there will be about a 10% increase in General Aviation (GA) movements at Brisbane Airport to cater for FIFO traffic (Airbiz and Tourism Futures International 2013).

Queensland's Tourism Sector

The tourism industry is a key driver of economic activity in Queensland. Tourism contributed \$22 billion to the Queensland economy and accounted for 7.8% of Queensland's GSP in 2011/12. In addition, Queensland attracted more than two million international visitors in the year ending June 2013.

Given the contribution tourism has made to the Queensland economy, in 2013 the Queensland Government set a vision for Queensland to be the lead tourism destination in Australia and to double overnight visitor expenditure in Queensland by 2020.

Brisbane Airport acts as a gateway to Queensland, particularly for international visitors and acts as a hub airport for intrastate flights. Not only is there a direct economic impact of Brisbane Airport, but also there is an impact from facilitated tourism. Facilitated tourism contributes to the Brisbane, Queensland and Australian economies. Figure 6.1 highlights the contributions Brisbane Airport will make to facilitated tourism during the planning period of this Master Plan.

The influence of population, tourism and mining growth on aviation at Brisbane Airport cannot be overestimated. The expected increase in population as well as economic, employment and tourism growth will continue to boost air travel. To meet this demand, it is vital Brisbane Airport continues to grow and operate in order to support the local, state and national economies.

CONTRIBUTING TO BRISBANE'S ECONOMIC DEVELOPMENT

The 2013 Brisbane City Plan, prepared by Brisbane City Council (BCC), highlights three key areas for employment growth over the next 20 years within the Brisbane area – the CBD, the Australia TradeCoast and the South Western Brisbane Industrial Gateway.

The Australia TradeCoast precinct – the area of Brisbane bounded by and including Brisbane Airport and the Port of Brisbane – is the second fastest growing employment hub in the region, only exceeded by Brisbane's CBD. Brisbane Airport is positioned to contribute to the growth in employment in the Australia TradeCoast precinct as a direct result of both aeronautical and commercial expansion.

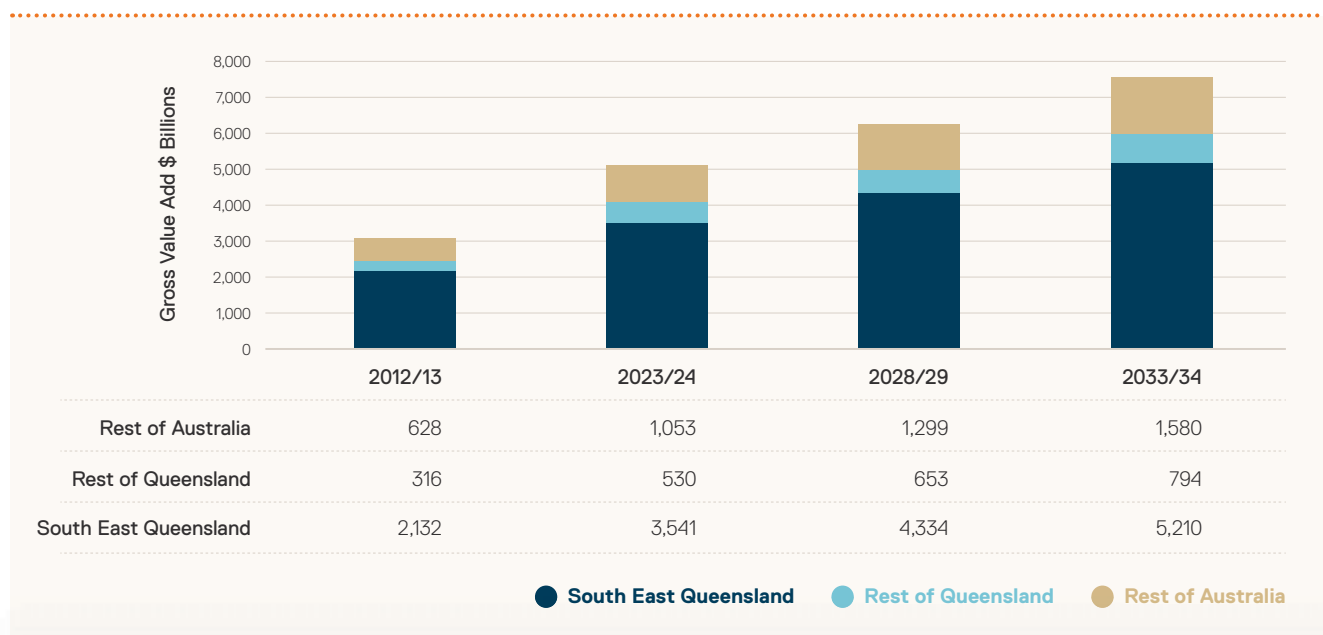
Also key to the success of Brisbane's economy is engaging with Asia, with a particular focus on the resource sector. The connections offered with Asia, coupled with being the largest Queensland hub airport for intrastate flights, provides a strong opportunity for Brisbane Airport to provide this transport link for Brisbane. This allows direct connections with Asia and caters for the FIFO workforce to transit to and from remote areas across Queensland.

FREIGHT – HIGH VALUE AND TIME CRITICAL

Brisbane Airport is the primary aviation gateway for Queensland, northern Australia and northern New South Wales in delivering air freight cargo. Brisbane Airport accounts for 12% of Australia's international air freight with the majority of freight carried in the cargo hold of passenger aircraft.

Brisbane Airport plays a critical role for mail freight, package delivery and sensitive exports, particularly fresh goods that require cold storage such as cut flowers and perishable goods. The airport's ability to process freight 24/7 plays an essential role in facilitating timely delivery of these goods.

FIGURE 6.1: BRISBANE AIRPORT'S ECONOMIC CONTRIBUTION VIA FACILITATED TOURISM



Source: DAE, 2013

Over the past five years, Brisbane Airport has consolidated its place alongside Sydney and Melbourne airports in international freight processing for Australia. Brisbane Airport has maintained its proportionate share and a long-term goal will be to increase the freight and logistics business through Brisbane Airport through attracting a dedicated international freight operation.

Table 6.4 outlines the distribution of aviation imports and exports across the major Australian airports.

Freight forecasts to 2034 are outlined in Chapter 5.1 Aviation Growth Forecasts.

PLANNING FOR 24 HOUR OPERATIONS

Brisbane Airport’s 24-hour operations are vital to the growth of Brisbane and Queensland. A curfew-free capital city airport is a powerful attraction for many businesses looking to invest in Queensland. In addition, 24/7 operations give the airport the flexibility to maintain services and attract additional flights, services and investment.

With curfew-free operations, Brisbane Airport has the ability to facilitate 216,000 international passenger movements each year during the night period as well as 112,000 domestic passengers during the same period.

If restrictions were placed on operating hours through a curfew being applied at Brisbane Airport, it would impact negatively on international and domestic flights, tourism, the Queensland and Australian economies, jobs, businesses, air freight and the community.

DAE assessed the economic impact across the Queensland and Australian economies and suggested the following impacts would occur over the next 20 years:

- » Lost value added would total \$1.7 billion for SEQ and \$1.95 billion across Australia
- » Loss of employment would also occur and in 20 years, it has been estimated that 5,800 FTE jobs would be lost in SEQ alone and up to 6,800 nationally
- » Cumulative cost to the Australian economy is estimated at \$13.6 billion over the next 20 years if all night time operations were lost.

Brisbane Airport is Queensland’s most critical transport hub and a significant component of the national transport network. The airport’s 24-hour status enables Brisbane to act as a gateway for the transport of fresh produce to overseas destinations, particularly Asia, as well as domestic freight travelling north, south and west. This significantly benefits local Queensland producers and farmers, allowing them to transport perishable freight overnight, avoiding potential air traffic delays and maintaining flexibility in reaching international destinations at suitable times.



CURFEW FREE

Tourism, economic and jobs growth are benefits of a curfew-free Brisbane Airport.

The Queensland Transport and Logistics Council indicates that air transport is a major component of the express freight and courier markets. Domestic air freight services utilise both freighter aircraft (that mostly operate between 11pm and 6am) and cargo capacity on most passenger aircraft.

Air transit offers fast transit times and reliable delivery, making it particularly suited to urgent shipments such as medical equipment, newspapers and vital spare parts. It also offers advantages for transporting commodities such as cut flowers, livestock, foodstuffs and pharmaceuticals.

A curfew could have a significant negative effect on air freight companies that have dedicated freighter services, as well as Queensland farmers and producers dependent on overnight deliveries.

TABLE 6.4: FREIGHT PROCESSING AT THE MAJOR AUSTRALIAN AIRPORTS IN 2012 (TONNES)

	Sydney	Melbourne	Brisbane	Perth	Adelaide	Other ¹	Total
Imports	292,830	127,904	55,867	47,152	10,310	7,142	541,205
Exports	125,413	110,192	47,224	32,274	9,017	4,780	328,900
Total	418,242	238,096	103,091	79,426	19,327	11,923	870,105
% of total	48%	27%	12%	9%	2%	1%	

¹ Other includes Cairns, Darwin, Gold Coast, Norfolk Island, Port Hedland, Sunshine Coast and Townsville airports.
Source: BITRE Statistical Report – International Airline Activity 2012, 2013

New commercial office building at Brisbane Airport



SOCIAL CONTRIBUTION OF BRISBANE AIRPORT

The key social benefits of Brisbane Airport arise primarily from time savings and convenience, as well as employment opportunities. For those locals who are travelling, either for business or leisure purposes, the presence of a local airport substantially lowers travel times through avoiding long-distance land travel. For leisure travellers there is the added benefit of greater choice of destination from air travel.

Operating in a city with a major airport presents businesses with trading opportunities. The relative ease of travel into and out of Brisbane enables business dealings with organisations based interstate and abroad and with

continued growth in the range of destinations serviced by direct flights out of Brisbane Airport, this capability will continue to increase.

Brisbane Airport makes visits to residents from interstate or overseas friends and family easier. The multicultural population of Brisbane means a relatively large share of local residents has relatives overseas, meaning that the number of individuals who stand to benefit from this is high.

Brisbane Airport is also an important component of medical care for those in regional Australia. Regional hospitals in Queensland are often not equipped to manage certain types of emergencies or procedures, meaning that patients from remote areas of the state need to travel to Brisbane for specialised treatment.

Aviation facilitates rapid transfer of these patients to Brisbane and at times this speed of transfer can be life-saving for patients.

6.2 Land Use And Precinct Development

Brisbane Airport is a major infrastructure facility servicing Brisbane and SEQ and represents an essential economic driver for Queensland's economy.

BAC is one of the largest commercial landholders in Queensland and its approach to land use planning over the next 20 years and beyond will increase Brisbane Airport's contribution to the performance of both the state and regional economies.

Brisbane Airport's land use strategy responds to market demand with a mix of business, retail, industry and tourism activities that complement and support the airport's existing activities and anticipated aeronautical growth.

BAC's vision for land use and precinct development is to create integrated development clusters that capitalise on airport assets. This vision seeks to achieve best practice built form, landscape and open space design, with increased use of public transport, improved access and connectivity.

The Master Plan sets out five airport precincts and nine sub-precincts within a sustainable land use planning framework.

These precincts and sub-precincts are:

- » Airport Central (Skygate)
- » Airport Central (Moreton Drive West)
- » Airport Central (Airport Drive West)
- » Airport Central (International T1)
- » Airport Central (Domestic T2)

6 ECONOMIC

- » Airport West (Central Parking Area)
- » Airport North (Airport North)
- » Airport South (Export Park)
- » Airport South (Da Vinci)
- » Airport South (Airport Industrial Park)
- » Airport East (Airport East).

In addition, a separate conservation area known as the Biodiversity Zone, accounts for Brisbane Airport's protection of high value environmental lands.

Delivery of the land use strategy for Brisbane Airport will occur in accordance with the development objectives of the Master Plan described in Chapter 5. Particular priorities are to ensure that Brisbane Airport will:

- » Contribute to regional economic wealth and employment generation
- » Ensure selective, profitable and timely aviation and commercial development
- » Ensure the timely delivery of new and improved airport capacity
- » Minimise adverse environmental impacts
- » Achieve an appropriate balance between the built environment and biodiversity values
- » Maximise airport accessibility and connectivity.

AIRPORT LANDSIDE DEVELOPMENT SINCE 2009

The 2009 Master Plan addressed the following objectives for future business and industry development of the airport:

- » Optimise airport operations and accessibility to the various precincts by airport users
- » Encourage business, industry and support facilities to cluster within individual precinct locations



- » Provide market led development which will provide a suitable return
- » Assist in delivering on the BAC vision.

Since 2009, BAC and its industry partners have completed a range of developments as set out in Chapter 3, Figure 3.1 of this Master Plan.

This Master Plan builds on this successful record of commercial growth and expansion with a land use strategy for future precinct development, as outlined in this chapter.

REGIONAL CONTEXT

Brisbane Airport has outstanding and unique attributes that favour its continued commercial growth. With 2,700 hectares of land, it is one of Australia's largest airports by area. Importantly, it has the largest buffer zone of any capital city airport in Australia, which separates airport operations from surrounding communities.

Brisbane Airport is located in the Australia TradeCoast precinct, which is a recognised trade and industry hub centred on the airport and port facilities.

Over 420 aviation-related, commercial and retail businesses are located in a number of commercial precincts across the airport's site. Together these businesses employ around 21,000 people, with this number expected to grow to over 50,000 by 2034.

Accessibility is central to the success of landside development at Brisbane Airport and the recently completed



1 Around 1,000 hectares of Brisbane Airport is available for aviation and non-aviation development.

2 Work on Brisbane Airport's New Parallel Runway commenced in August 2012.

major upgrades of roads including BAC's Moreton Drive, and the Gateway Motorway and Airportlink delivered by the Queensland Department of Transport and Main Roads (TMR) have made quantum improvements to accessibility. BAC's Ground Transport Plan (refer Chapter 12) includes an integrated set of short, medium and long-term projects to progressively further enhance access to and connectivity within Brisbane Airport.

LAND USE STRATEGY

This section outlines BAC's intended on-airport land uses and zonings. It also shows how the intended on-airport land uses and zonings relate to the adjoining off-airport land uses. This follows closely the intent of Chapter 4 Legislative Environment, which describes how the *Airports Act 1996* (Airports Act) and associated regulations require BAC to address the extent, if any, of consistency with relevant state and local government planning schemes.

Throughout this section, intended land uses are described using zoning terminology for landside areas that is consistent with the Brisbane City Plan terminology and the relevant state government planning land use terminology. For example, the 'major centre' concept used in the Brisbane City Plan is also applied in describing Brisbane Airport land uses.

6.3 The Five-Year Property Development Strategy

In 2012 BAC embarked on a review of its property development strategy that created a broader appreciation of Brisbane Airport as an attractive unique property investment opportunity and as the preferred address for a diverse range of businesses.

The strategy encompassed key themes of:

- » Diversity – offering opportunities simultaneously to sub-markets which will stimulate the pace and volume of developments whilst adding to shareholder value
- » Sustainability – providing a coherent framework of sustainable infrastructure and environment initiatives that will attract businesses seeking a reputation of encouraging responsible development practices
- » Consolidation – creating critical mass through consolidated and concentrated development opportunities

- » Value Add – investing in high quality public realm and place setting parameters to achieve high quality design outcomes.

As a 50-year development vision, the strategy identified the staging and business growth potential across the available 1,000 hectares of non-airside and developable area.

Where We Are in 2014

In 2014, there are 33 BAC owned buildings (10 commercial, 18 industrial, two retail and three specialised buildings) spread across 46 hectares of landside-developed areas, excluding terminal areas that account for approximately 45 hectares. There is 114 hectares of ground-leased land with a further 521 hectares of vacant land.

In the 2009 Master Plan, the 2,700 hectares of site identified nine distinct precincts and land use zones commensurate with the activities that complement and support airport development.

The Property Development Strategy identified opportunities to consolidate and concentrate activities to five massed precincts as per Table 6.5 and represented as Figure 6.2.

Recognising the extensive land area of the precincts and the variation of uses proposed across those areas, sub-precincts provide an area address for development intent and marketing opportunities. The sub-precinct naming conventions adopted for the Master Plan are:

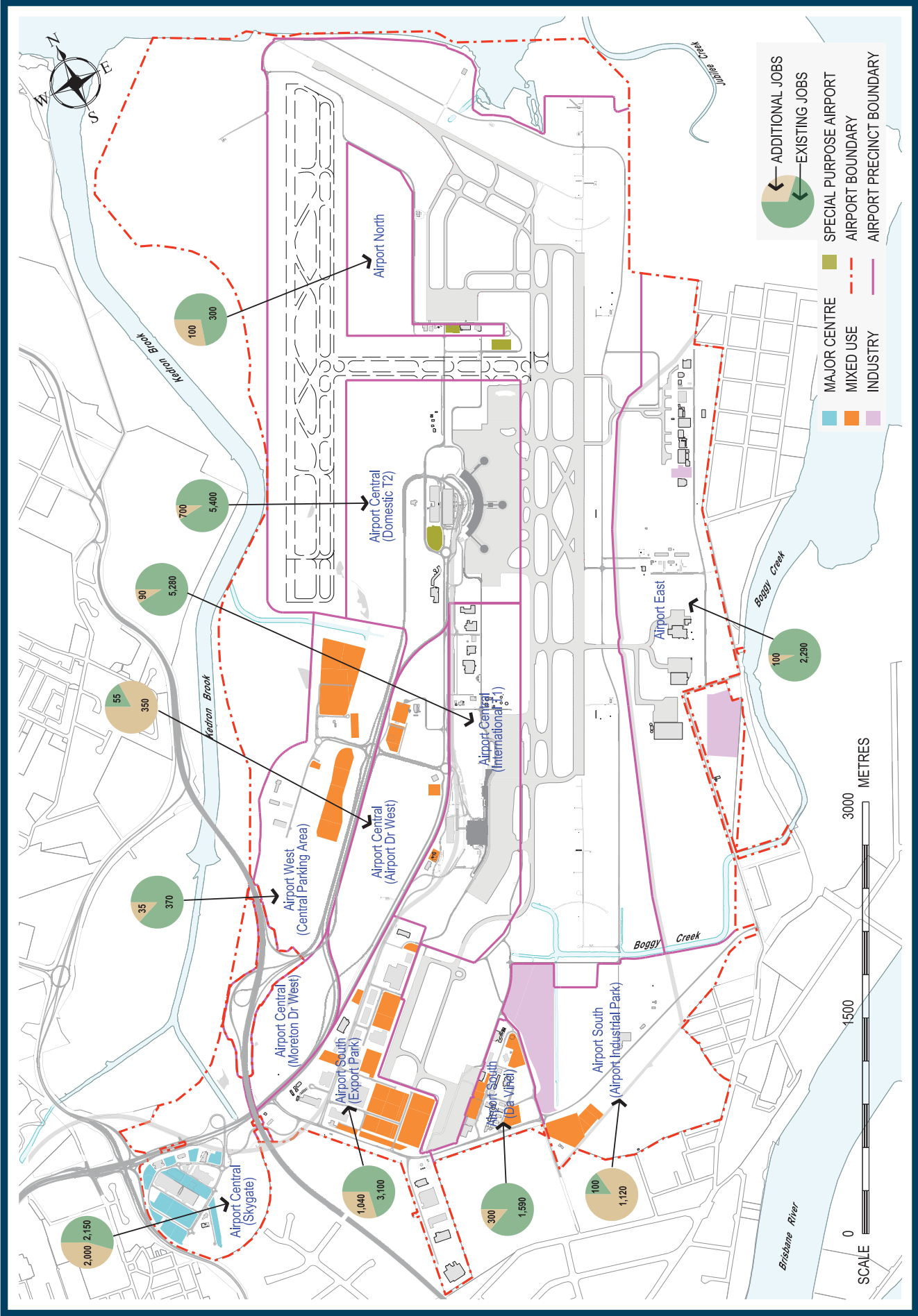
- » Airport Central – Skygate, Moreton Drive West, Airport Drive West, International T1 and Domestic T2
- » Airport East – Airport East
- » Airport South – Export Park, Da Vinci, Airport Industrial Park
- » Airport North – Airport North
- » Airport West – CPA.

TABLE 6.5: PROPERTY DEVELOPMENT STRATEGY PRECINCT INTENT

Precinct Name	Intent
Airport Central	<ul style="list-style-type: none"> » Concentrated activity with high quality and urban public realm » Energetic precinct for events and 24 hour gateway » Created as the airport spine, it attracts naturally ventilated and quality subtropical public realm.
Airport East	<ul style="list-style-type: none"> » Maximises airside connection potential for industrial and business activities » A precinct which can respond to changing market demands and industry requirements.
Airport South	<ul style="list-style-type: none"> » Efficient and flexible land options which have good transport connections » Provisions for high quality built form which is scaled and proportioned to interface with street and landscape settings.
Airport North	<ul style="list-style-type: none"> » Logistics hub for airside industrial developments and businesses » Large footprint sites protective of airside operations.
Airport West	<ul style="list-style-type: none"> » Integrated with Central Parking Area (CPA) and direct connection to the terminals through mass transit options » Provides a link to recreation and tourism uses with walking and cycle trails through ecological areas linking to Moreton Bay and Kedron Brook.

6 ECONOMIC

FIGURE 6.2: FIVE-YEAR PROPERTY DEVELOPMENT PLAN



The Property Development Strategy 2014 – 2019

Over the period 2014 to 2019, BAC proposes to deliver a property development plan capturing opportunities as they arise to service the airport with an array of developments consistent with the zoning of special purpose airport, mixed use, major centre, industry, and conservation.

As market conditions will dictate how property development responds, BAC will focus on developments that reflect the state of the market at the time and those which address the intent of the development strategy.

There may also be developments that occur not driven directly by market demand. Rather, BAC may construct a speculative building and offer it to market.

Table 6.6 is an overview of the proposed five-year property development plan, presenting the precinct target, the applicable zoning, the intended use and the estimated gross floor area (GFA).

Other aspects considered in the 2014 Master Plan and influenced by the Property Development Strategy 2014 – 2019 include Chapter 6.3 – Utilities, Chapter 6.4 – Drainage and Chapter 12 – Ground Transport Plan.

An Integrated and Flexible Approach

Planning for the development of Brisbane Airport is a continuous process that seeks to integrate activities both on and off airport and provide flexibility to respond to market opportunities and to community and business expectations.

The Master Plan's development objectives ensure that BAC retains the flexibility to manage, balance and respond to future market changes and the needs of the airport and its shareholders, while also achieving its sustainability goals.

TABLE 6.6: PROPOSED FIVE-YEAR PROPERTY DEVELOPMENT PLAN

Precinct	Zoning*	Intended Uses*	Estimated GFA (m ²)	Estimated Additional Employment
Airport South (Airport Industrial park)	Mixed Use	Office, animal keeping, warehouse	111,800	1,120
Airport South (Da Vinci)	Mixed Use	Office, warehouse, aircraft maintenance facility, aviation education facility, car park	30,960	300
Airport South (Export Park)	Mixed Use, Industry	Office, warehouse, telecommunications, food and beverage outlet, car park	105,760	1,040
Airport East	Industry	Office, aircraft maintenance facility, car park	7,300	100
Airport Central (Skygate)	Major Centre	Public administration building, office, shop, car park, event entertainment facility, wholesale supplies, food and beverage outlet, public transport facility	63,750	2,000
Airport Central (Airport Drive West)	Mixed Use, Special Purpose Airport	Service station, shop, showroom	13,780	350
Airport Central (Domestic T2)	Special Purpose Airport	Hotel and motel, office, public administration building	29,300	700
Airport Central (International T1)	Special Purpose Airport, Mixed Use	Public administration building, office, aviation support facility, car park	2,570	90
Airport West (CPA)	Mixed Use	Car park, utility installation	300	35
Airport North	Special Purpose Airport	Aviation activity, aviation support facility	5,080	100
Airport Central (Moreton Drive West)	Mixed Use		Nil	Nil

* Zoning and intended uses will be in accordance with those activities listed in the land use chapter. Whilst every attempt has been made to confirm the intended uses of development, market conditions will dictate if developments as listed in the table above meet the requirements of the development strategy.

This flexibility is similar to that promoted by the Queensland Government's recent planning reforms and associated new planning regulations, where performance-based planning and merit-based proposals ensure that 'best fit' land uses and developments are not excluded, or overlooked.

Accordingly, the intended land uses within each zoning are not an exclusive list of the type of activities that may be permitted for that zoning. Proposed land uses which are not specified in a particular airport precinct and/or land use zoning may be permitted on a case by case basis, following a performance-based planning assessment, which also ensures the appropriate level of compliance with airport development approval requirements.

For a development activity not included in the list, BAC will assess whether the proposed land use is compatible with the intended land uses listed for the associated zoning, the overall outcomes desired for the relevant precinct and sub-precinct (where appropriate) and the development objectives of the Master Plan.

Furthermore, BAC will continue to consider the amenity of surrounding areas in the planning, design and development of infrastructure and sites.

Interim Uses

BAC will allow for interim use within any precinct on-airport, including undeveloped areas of Airport Central International T1 and Domestic T2, Skygate, and Airport East.

BAC will restrict interim uses to short-term periods or leases, where applicable, with the option of extending the period only if the aeronautical or other intended long-term land use of the area is not immediately required. Interim uses will focus on activities requiring minimal infrastructure support and/or where buildings will be of a low key demountable or transportable design. Uses listed as suitable in any of the Master Plan zones may be considered as possible interim uses.

Pre-Existing Interests in Airport Land

When BAC became the airport-lessee company for Brisbane Airport in July 1997, it assumed certain pre-existing lessor obligations under various leases. BAC also became the head-lessee under the airport lease subject to a number of other interests in the airport land (such as easements). Some of those contractual and other pre-existing rights remain in existence although many have since expired. In any proposal for future development of the airport, BAC will act consistently with any such obligations or interests, which exist at the relevant time.

Land Use Zones and Related Developments

For the purpose of this Master Plan, BAC has established five land use zonings (Figure 6.4) and accompanying land use tables to reflect intended uses within the airport site.

The five land use zones are:

- » Special Purpose Airport (refer page 82)
- » Mixed Use (refer page 83)
- » Major Centre (refer page 84)
- » Industry (refer page 85)
- » Conservation (refer page 86).

The airport precincts and allocated land use zonings are listed in Table 6.7.

A long-term, integrated approach has been adopted in specifying a range of land uses for Brisbane Airport.

The zonings and their intended land uses adopt a realistic approach to existing and future use of airport land, and promote a mix of compatible uses in locations that accommodate the expected growth and enhance site development opportunities and outcomes. The land use zonings have the following advantages:

- » The concentration of activity in the Skygate sub-precinct at the entrance to the Brisbane Airport is zoned as a major centre, reflecting its existing uses and potential for expansion of major commercial and service facilities

TABLE 6.7: PRECINCTS AND LAND USE ZONINGS

Precincts	Sub-Precincts	BAC Land Use Zonings
Airport Central	Skygate	» Major Centre
Airport Central	Moreton Drive West	» Mixed Use
Airport Central	Airport Drive West	» Mixed Use » Special Purpose Airport
Airport Central	International T1	» Special Purpose Airport » Mixed use
Airport Central	Domestic T2	» Special Purpose Airport
Airport West	Central Parking Area	» Mixed Use
Airport North	Airport North	» Special Purpose Airport
Airport South	Export Park	» Mixed Use » Industry
Airport South	Da Vinci	» Mixed Use
Airport South	Airport Industrial Park	» Mixed Use » Industry
Airport East	Airport East	» Industry
Conservation area		» Conservation

- » Land adjoining the major roads leading to the Domestic T2 and International T1 is zoned for mixed uses and high profile airport related activity, taking advantage of the high public exposure and sub-tropical landscape setting
- » Land with convenient transport access, in close proximity to aircraft aprons, and/or with higher aircraft noise exposure is zoned for industrial land uses
- » Land close to the nearby Pinkenba residential area is separated by a nature conservation buffer, including BAC's Conservation Area zoned for conservation purposes, to enhance residential amenity outcomes

- » Facilities compatible with the land use zoning generally will be developed in accordance with Brisbane Airport's development control guidelines to balance built form and landscaping, provide for suitable setbacks and adequate buffers, protect urban landscape values and enhance public open space networks.

The relationship between the Brisbane Airport land use zonings and the surrounding Brisbane City Plan zoning is presented in Figure 6.3. This figure illustrates how the intended on-airport land uses harmonise with land use intent for the area under the planning control of BCC.

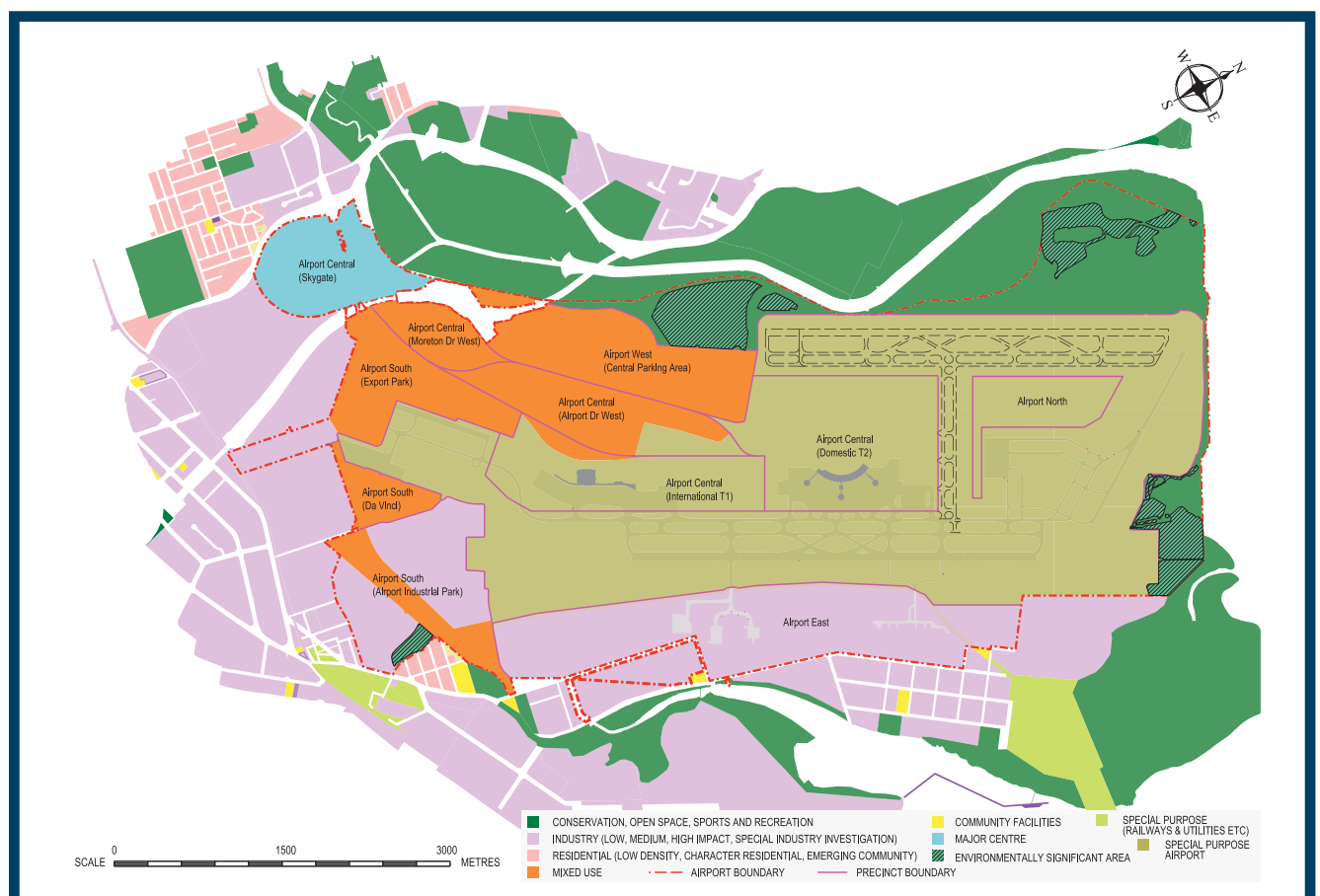
Brisbane Airport's land use zonings are presented in the following section, along with a zoning statement, zoning outcome and intended uses.

ZONINGS

Zoning of Land to Which This Master Plan Applies

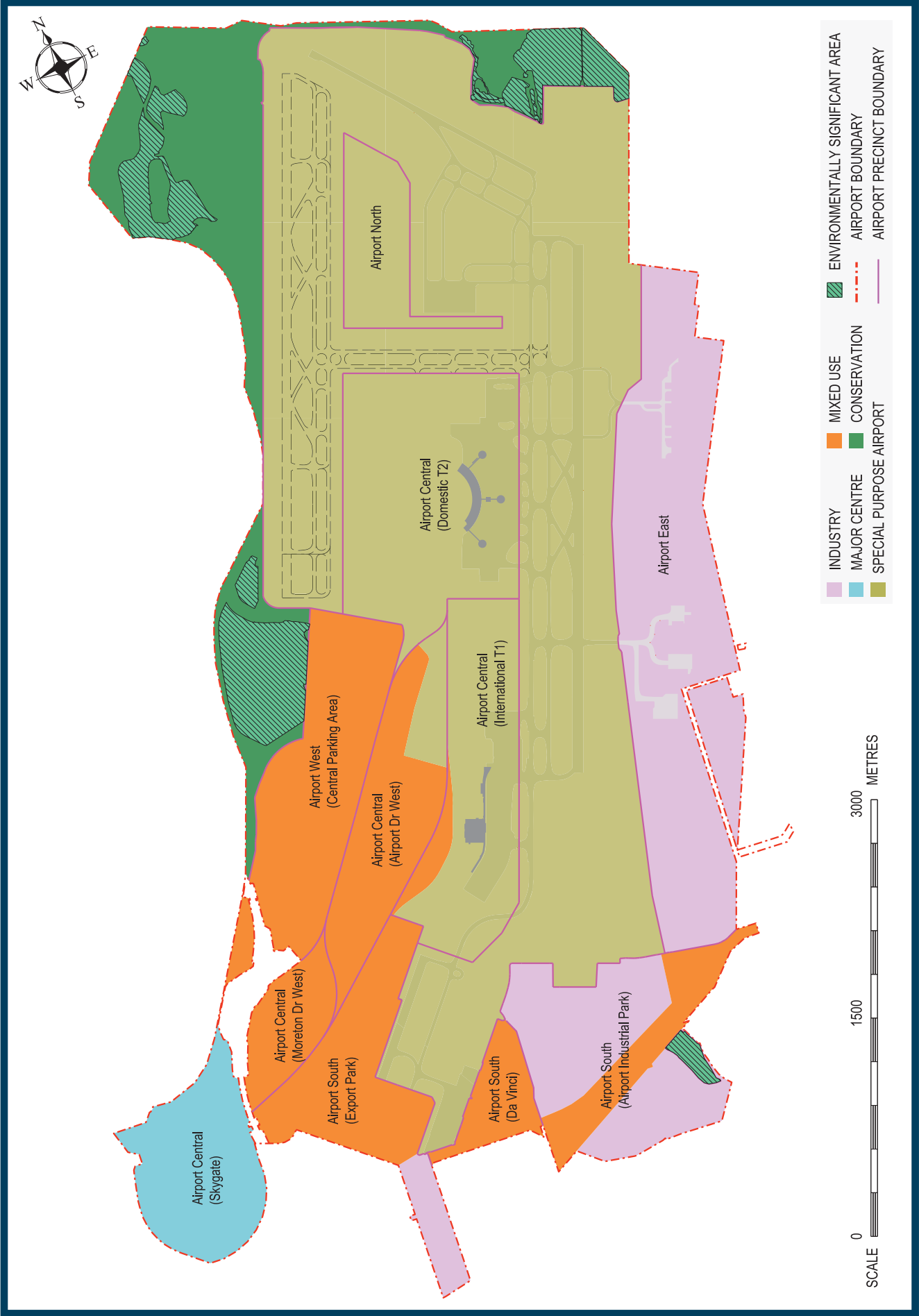
The following zoning provisions should be read in conjunction with the land use zonings presented in Figure 6.4. Where there are inconsistencies between current land use on Brisbane Airport and the Master Plan as represented by the land use zonings in Figure 6.4, the current land uses may continue and development of those sites for their current purpose shall be regarded as an additional permissible form of development.

FIGURE 6.3: BRISBANE AIRPORT AND SURROUNDS LAND USE ZONES



6 ECONOMIC

FIGURE 6.4: LAND USE ZONES ON BRISBANE AIRPORT



Definitions

The dictionary, contained in Chapter 14, defines terminology for the purposes of this Master Plan. In relation to landside (non-aeronautical areas) this aligns closely with the land use classifications used in BCC's City Plan, which responds to the state government planning provisions. Accordingly, definitions for the land uses adopted for this Master Plan are generally consistent with the local and state government definitions.

However, in some instances, definitions have been altered, or a new one prepared, to adequately reflect the unique requirements of Brisbane Airport and specialisation related to aeronautical drivers.

Zoning Purpose and Outcomes

Before BAC grants consent for any intended land use, it must have regard to the purpose outcomes of the relevant zoning, the overall outcome for the precinct or sub-precinct and the Master Plan's development objectives.

Special Purpose Airport

This zoning (olive in Figure 6.4) applies to the following airport precincts and sub-precincts:

- » Airport Central (Airport Drive West)
- » Airport Central (International T1)
- » Airport Central (Domestic T2)
- » Airport North (Airport North).

The Special Purpose Airport zoning applies to the terminal buildings and areas for future terminal expansion.

Development to facilitate the provision of goods and services to meet the quality and standards that domestic and international travellers expect from a world-class transport hub are also intended in this zoning.

This zoning also caters for activities centred on express freight, aviation and avionics support, catering, food processing and aircraft service support for all runways including the NPR. In addition, development of aviation support facilities to maximise efficiency of airport operations is intended within this zoning, including any development that is incidental or ancillary to those facilities.

Within the Special Purpose Airport zoning, the intended uses include those listed in Table 6.8.

Fauna protection in Brisbane Airport's Biodiversity Zone



6 ECONOMIC

TABLE 6.8: SPECIAL PURPOSE AIRPORT

Purpose		
The Special Purpose Airport zone provides for airport uses together with any anticipated, compatible and necessary complementary uses.		
Outcomes		
1. Development contributes to the function of the Brisbane Airport aeronautical facilities and its associated uses in an integrated and co-located manner to maximise efficiency of the use of land and the airport infrastructure.	5. Development is supported by complementary uses of an appropriate scale and purpose to directly serve the employees and activities of the zone.	
2. Development provides for any of the following:	6. Development achieves a high standard of environmental performance by incorporating principles of innovative, sustainable and efficient design, construction and operation, to encourage water conservation and responsiveness to climate.	
» Housing, servicing, maintenance and repair of aircraft	7. Development maximises road, rail, public transport and transport connections and accessibility to ensure efficient and safe movement of people, goods and freight, and accessibility for visitors, passengers and employees.	
» Landing and departure of aircraft	8. Development contributes to the role of Brisbane Airport in facilitating trade and employment growth.	
» Assembly and dispersal of passengers and goods on or from aircraft	9. Development is designed, constructed and operated to maintain the safety and security of people and property.	
» Ancillary activities serving the needs of workers, passengers and visitors to an airport, such as shopping, food and drink outlets and tourism services	10. Enables interim uses within the zone prior to land being needed for aviation activities.	
» Associated training, education and aviation facilities.		
3. Development is appropriately sited and located, and building and landscape design are of a scale, height and bulk that are compatible with the function of Brisbane Airport.		
4. Development creates a variety of building forms, materials and façade treatments.		
Intended Uses		
» aircraft maintenance facility	» hotel and motel	» research station or centre
» amusement parlour	» indoor sport and recreation	» runway
» aviation activity	» landing	» shop
» aviation support facility	» liquid fuel depot and distribution facility	» short-term accommodation
» car park	» navigational aids	» signage
» distribution centre	» office	» taxiway
» emergency services	» operational airspace	» telecommunications/information and call centre
» entertainment facility	» park	» temporary structure
» erosion control and protection	» parking space	» tourist information centre
» food and beverage outlet	» place of worship	» tourist shop
» freight handling facility	» public administration building	» transfer corridor
» function facility	» public meeting place	» transport depot
» general aviation	» public safety area	» utility installation
» health care services	» public transport facility	» warehouse
» helipad	» recreation and sport facility	» works depot
» heliport	» research and technology industry	

Mixed Use

This zoning (orange in Figure 6.4) is dedicated to mixed use development clustered into commercial nodes to provide employment opportunities in highly accessible locations. Airport precincts and sub-precincts with this zoning are:

- » Airport Central (Moreton Drive West)

- » Airport Central (Airport Drive West)
- » Airport West (Central Parking Area)
- » Airport South (Export Park)
- » Airport South (Da Vinci)
- » Airport South (Airport Industrial Park).

The Mixed Use zoning includes broad, compatible and flexible land uses which will support a range of industry,

commercial and business activities. Within this zoning, on-airport ancillary land uses include retail, commercial, leisure, entertainment, recreation and service industry activities to support the local workforce and contribute to the mixed-use activities.

Within the Mixed Use zoning, the intended uses include those listed in Table 6.9.

TABLE 6.9: MIXED USE

Purpose

The Mixed Use zone provides for a diverse mixture of development including business, retail, tourist accommodation and associated services, service industry and low impact industrial uses.

Outcomes

1. Provide for a diverse mix of uses tailored to the role and function of Brisbane Airport and its surrounding area and to enable a level of economic and social activity to serve the intended mix of visitors, workers and residents.
2. Provide premises to accommodate firms seeking to combine their corporate office and manufacturing and distribution industry functions.
3. Provide for a mix of industrial activities, commercial enterprises and workshops, facilitated and supported by office activities set in a business park environment.
4. Development provides for a wide range of industry and business uses, including clean low impact industry, research and technology facilities, knowledge creation and entrepreneurial activities and service industries that are more compatible with urban areas.
5. Development results in a use that activates the Mixed Use zone at different times of the day and week to create a vital and vibrant environment.
6. Ensure a high quality commercial environment with an intensity and form of development that is tailored to the location.
7. Provide for development that capitalises on proximity to Australia TradeCoast and Brisbane Airport commercial environment.
8. Development of buildings is of a height, bulk, scale and form tailored to its specific location and to the characteristics of the site.
9. Development provides a built form that creates a consistent and cohesive streetscape and aligns with pedestrian connections and shelter.
10. Development provides consistent and cohesive landscape and streetscape treatments.
11. Development is sensitively designed and operated to avoid or mitigate any potential adverse impact on an adjoining use.
12. Enables interim uses within the zone prior to land being needed for development activities.

Intended Uses

- » animal keeping
- » industry
- » aircraft maintenance facility
- » aviation education facility
- » bulky goods facility
- » car park
- » campus accommodation
- » distribution centre
- » education establishment
- » emergency services
- » entertainment facility
- » erosion control and protection
- » event entertainment facility
- » food and beverage outlet
- » freight handling facility
- » function facility
- » general aviation
- » health care services
- » hotel and motel
- » indoor sport and recreation
- » industrial retail outlet
- » major sport, recreation and entertainment facility
- » nightclub entertainment facility
- » office
- » operational airspace
- » outdoor sales
- » park
- » parking space
- » public administration building
- » public transport facility
- » recreation and sport facility
- » research and technology industry
- » research station or centre
- » service station
- » shop
- » signage
- » short-term accommodation
- » storage premises
- » showroom
- » telecommunications/information and call centre
- » temporary structure
- » tourist information centre
- » tourist shop
- » transfer corridor
- » transport depot
- » utility installation
- » veterinary services
- » warehouse
- » wholesale supplies
- » works depot

Note: Intended use definitions to exclude precincts as follows –
 » Major sport, recreation and entertainment facility (excludes Airport South)
 » Event entertainment facility (excludes Airport South).

6 ECONOMIC

Major Centre

This zoning (blue in Figure 6.4) applies to the Airport Central (Skygate) precinct.

Skygate is developing into a fully integrated airport business, retail and

leisure community, which is located off the Airport Drive airport entrance.

Skygate is the local business, retail and tourism hub for Brisbane Airport with uses including commercial offices, hotels, retail, visitor centres, child care, tourism

outlets, cafes and dining facilities.

Within the Major Centre zoning, the intended uses include those listed in Table 6.10.

TABLE 6.10: MAJOR CENTRE

Purpose		
The Major Centre zone provides for a diverse use mix that includes concentrations of higher order retail, commercial, offices, tourist accommodation, administrative and health services, community, cultural and entertainment facilities and other uses capable of servicing Brisbane Airport and the surrounding local areas.		
Outcomes		
<ol style="list-style-type: none"> Provides for the mix and intensity of uses and level of economic and social activity that supports the role of the Skygate centre as the activity core for Brisbane Airport and its environs to operate as a complete subregional catchment. Development creates a highly diverse range of centre activities, comprising commercial, retail, government, service, community and cultural activities, which together with appropriately located and operating entertainment functions such as restaurants, hotels and other leisure facilities, create a 24/7 activity centre. Development provides for high order retail activities and commercial activities that create a focus point for subregional employment and district or branch government functions including health, education and cultural services. Development is of a height, bulk, scale and form that are tailored to its specific location and to the characteristics of the site and the centre. Development capitalises on the centre's proximity to suburban or inter-urban public transport networks. Development provides public spaces and landscaping that soften the dominance of buildings, provide breathing space and encourage outdoor activity integrated with the surrounding area and enable fine-grained pedestrian connectivity through the centre. Development for building addresses and interfaces with the street and other adjoining public spaces including via active uses at ground level to ensure highly active streets and to provide surveillance of the public domain. Development occurs in an integrated and coordinated manner both within the site and in relation to surrounding land uses. Development is sensitively designed and operated to avoid or mitigate any potential adverse impacts on an adjoining use. Enables interim uses within the zone which can include special events, prior to land being needed for development activities. 		
Intended Uses		
» amusement parlor	» hotel or motel	» research and technology industry
» bulk landscape supplies	» indoor sport and recreation	» shop
» bulky goods facility	» major sport, recreation and entertainment facility	» shopping centre
» car park	» nightclub entertainment facility	» short-term accommodation
» child care centre	» office	» showroom
» club	» operational airspace	» signage
» ecotourism facility	» outdoor sales	» telecommunications/information and call centre
» education establishment	» park	» temporary structure
» emergency services	» parking space	» transport depot
» entertainment facility	» place of worship	» tourist information centre
» erosion control and protection	» produce market	» tourist shop
» event entertainment facility	» produce store	» utility installation
» food and beverage outlet	» public administration building	» wholesale nursery
» function facility	» public meeting place	» wholesale supplies
» garden centre	» public transport facility	» works depot
» hardware and trade supplies	» recreation and sport facility	
» health care services		

Industry

This zoning (purple in Figure 6.4) caters for industry uses.

Airport precincts and sub-precincts with this zoning are:

- » Airport South (Export Park)
- » Airport South (Airport Industrial Park)
- » Airport East (Airport East).

Land uses within this area are industry and warehousing with carefully managed environmental impacts. The location of this zoning is intended to include buffers to help protect any existing residential neighbourhoods

from industrial land uses. Retail, commercial and office activities are also intended which support the local industrial activities.

The Industry zoning features a wide range of industries and complementary activities. The uses that can be accommodated include most service and traditional industrial uses. Some 'noxious or offensive' industrial applications may also be accommodated depending on the merits of the proposal, the nature of surrounding development and impacts of the use on air and water quality, noise abatement, danger from fire and explosion or any other relevant matter.

BAC recognises drainage requirements may impose additional constraints on development at Airport Industrial Park. BAC will ensure no material impacts to off-airport drainage or flooding from developments in Airport Industrial Park or Airport East. When considering proposed land uses in this zone, BAC is cognisant of BCC planning intentions for adjoining off-airport areas, and hence has adopted intended uses that can co-exist with the future plans of Myrtletown and Pinkenba.

Within the Industry zoning, the intended uses include those listed in Table 6.11.

TABLE 6.11: INDUSTRY

Purpose		
The Industry zone provides for a wide range of industrial uses and may include non-industrial and business uses that complement industrial activities or where appropriate provide a suitable buffer to adjoining uses.		
Outcomes		
<ol style="list-style-type: none"> 1. Facilitate and maintain the long-term viability of industrial uses by encouraging a broad range of industry and support activities. 2. Development for an industrial use is located, designed and managed to maintain safety to people, avoid significant adverse effects on the natural environment and minimise impacts on adjacent non-industrial land. 3. Development provides a built form, massing and setback that contribute to a high standard of visual scale. 4. Development responds to land constraints and mitigates any adverse impacts on environmental values. 5. Development in a flood prone area is limited to uses that prove no net worsening offsite in the event of a flood. 6. Enables interim or short-term uses, which can be established to align with the intended use. 		
Intended Uses		
» aircraft maintenance facility	» indoor sport and recreation	» showroom
» bulky goods facility	» industry	» signage
» car park	» liquid fuel depot and distribution facility	» storage premises
» distribution centre	» office	» taxiway
» emergency services	» operational airspace	» transport depot
» erosion control and protection	» outdoor sales	» utility installation
» food and beverage outlet	» pastoral activity	» warehouse
» freight handling facility	» park	» wholesale supplies
» general aviation	» parking space	» works depot
» hardware and trade supplies	» public transport facility	
» horticulture activity	» research station or centre	

Conservation

This zoning (dark green in Figure 6.4) is dedicated to BAC's Conservation area and is managed using BAC's Biodiversity Management Strategy.

Land within the Conservation area is dedicated to protecting and enhancing biodiversity values, and includes Environmentally Significant Areas (shown in hatched light green in Figure 6.4). No development is to occur within a designated Environmentally Significant Area.

Conservation areas will be managed to retain their biodiversity values in a way that does not compromise

airport safety, particularly from wildlife hazards. The Conservation area also provides opportunities for nature-based outdoor recreation, where considered appropriate.

The conservation area zoning covers areas of the airport with biodiversity values. As can be seen in Figure 6.3, the majority of the conservation areas lie along the western boundary of Brisbane Airport. The western on-airport conservation area complements the adjoining BCC-managed Kedron Brook floodway corridor, which BCC has zoned for conservation and park uses.

BAC intends to manage the conservation areas in close collaboration with BCC to maintain biodiversity values along the Kedron Brook floodway corridor (incorporating both on and off-airport land). Similarly, the conservation area along Brisbane Airport's western frontage also adjoins BCC land, as well as the intertidal flats of Moreton Bay. BAC will continue to collaborate with BCC and the Queensland Government in managing the biodiversity values of these foreshore areas.

Within the Conservation area intended uses include those listed in Table 6.12.

TABLE 6.12: CONSERVATION

Purpose	
The Conservation area provides for the protection, restoration and management of areas identified as supporting significant biological diversity and ecological integrity.	
Outcomes	
<div><div>1. Conservation and maintenance of the integrity of the local area's wildlife, habitats and other significant ecological assets and processes over time, where this is consistent with safe airport operations.</div><div>2. Land is managed primarily as a park or environmental facility, for its nature conservation values and ecological functions, including a broad range of ecosystem services.</div><div>3. Development provides for a natural environment-centred land use including sustainable outdoor recreation and educational activities that are provided in accordance with a best practice planning and management framework.</div><div>4. Development protects the values and function of the Conservation area through innovative design, planning and construction approaches, including application of noise, light and physical buffers external to the values being conserved.</div><div>5. Development responds to land constraints, and mitigates any adverse impacts on environmental values whilst protecting the existing and future infrastructure.</div></div>	
Intended Uses	
<div><div>» biodiversity zone</div><div>» ecotourism facility</div><div>» environmentally significant areas</div><div>» erosion control and protection</div></div>	<div><div>» landing</div><div>» operational airspace</div><div>» public safety area</div><div>» utility installation</div></div>

AIRPORT PRECINCTS

In establishing the five major development precincts (and their nine distinct sub-precincts), a high level of emphasis is placed on creating and maintaining clusters of businesses and land use synergies that generate a strong sense of identity and community. The intent of the five precincts is as follows:

AIRPORT CENTRAL

Airport Central is a mass of activity, energy and vitality including the International T1, Domestic T2, Airport Drive West, Moreton Drive West and Skygate. The high-quality retail, leisure and commercial environment of Skygate enlivens the precinct as the gateway to the airport.

Airport Central, in common with all the development precincts, has been designed according to the planning principle of consolidation and concentration of the development footprint. It allows the achievement of critical masses of activity on a manageable range of development fronts and works to maximise the value of expenditure on infrastructure.

AIRPORT WEST (CENTRAL PARKING AREA)

Covering a large area with a predominantly natural character, Airport West provides a buffer to Kedron Brook and links the airport to Moreton Bay. This area provides a significant future opportunity for protecting and enhancing the environment for Brisbane Airport through BAC's commitment to biodiversity, sustainable management and conservation.

This precinct includes the CPA and caters for a business park and combines a considerable area of parking with associated service buildings and small offices. Mixed industry and business uses in the sub-precinct include commercial offices, car rental depots, staff parking, remote public parking, ground transport operations holding areas and future maintenance facilities for transport and logistic operations.

1



2



1 International T1 is a primary component of the Airport Central precinct.

2 A Biodiversity Zone has been established at Brisbane Airport.

6 ECONOMIC

AIRPORT NORTH

Airport North provides a future logistics hub for industrial and aviation related developments and businesses that require airside access.

The Airport North precinct includes the General Aviation area, and is strategically located adjoining the taxiway systems to runways 01R/19L and 14/32 and the New Parallel Runway (NPR).

AIRPORT SOUTH

Airport South will be a connected village-like precinct with quality amenity and excellent motorway access. An emphasis on diverse built form outcomes and sustainable development initiatives will help differentiate this area.

This precinct provides for efficient flexible land options connected with good transport access.

AIRPORT EAST

The primary focus for this precinct is aviation maintenance, manufacturing and associated aviation support industries.

The Airport East precinct comprises maintenance and manufacturing facilities with direct airside access for defence suppliers, major domestic airlines and a range of other aviation industry operators.

As an industrial zone, landside areas of this precinct consist of aviation support and aviation-related activities, including maintenance, repair and overhaul hangars, workshops for manufacturing, light industry uses and fire fighting services.



1 The Royal Flying Doctor Service operates from Airport North.

2 Australian air Express is located in the Airport South precinct.

3 iSeek data storage centre in Airport South precinct.



Precinct Plans

Consistent with the Master Plan, BAC has developed indicative precinct development plans. Each precinct plan is guided by the Master Plan's development objectives, zoning and airport precinct overall outcomes to meet infrastructure demand, manage growth and facilitate business generation for the airport and region over the next 20 years.

The precinct planning process is used to identify and formulate a framework that is responsive, innovative and sustainable. The process includes an assessment of:

- » Constraints and opportunities
- » Alternative concepts to establish the preferred location of a specific land use activity

- » Environment, landscape, land use and transport integration
- » Development staging
- » Utility requirements.

Challenges to Airport Development

In planning for the further development of the airport, the site presents a number of challenges, which could impact on the ultimate development of the airport. These constraints include:

- » Much of the land is low lying and continues to require significant quantities of fill to raise the land above flood and storm tide levels and account for future sea level rise impacts

- » Environmental protection of Kedron Brook floodway to the west of the airport must be achieved, along with protection of marine areas along the Moreton Bay foreshore and the Brisbane River, near Boggy Creek
- » A number of easements over airport land including Queensland Urban Utilities', (QUU) sewer pipeline to Luggage Point, and Energex's 110 kilovolt-ampere (kVA) and 33 kVA underground power services.

Airport Design Principles

Brisbane Airport design is contemporary and sub-tropical reflecting the location of the airport in the 'Sunshine State'. Airport visitors, travellers and workers who use the two major airport terminals, the nearby car parking and other airport facilities experience a sub-tropical landscape. The physical setting of Brisbane Airport is intended to create a memorable and enjoyable experience for airport users and is achieved through the integration of built form (roads, bridges, signs and buildings), the airport's landscape values, and an open space network and transport system.

BAC's design principles will continue to strive for this distinctive sense of place and for Brisbane Airport to be a functional and pleasant place to work, relax and engage in travel.

The planning and design process adopts a number of principles to ensure that all elements co-exist in a complementary way. Single developments will typically not dominate within the landscape unless the development is strategically important in the overall design scheme for the airport precinct, such as the airport terminals and control tower. Urban design within each precinct is coordinated to achieve optimum heights, building setbacks to boundary lines, and landscaping and open space between buildings to enhance amenity.

Landscaping is a feature of Brisbane Airport's Skygate precinct



Development within the Airport Central (International T1) and the Airport Central (Domestic T2) sub-precincts is carefully considered to permit future terminal growth while optimising links to the terminals, rail stations, car parks, pedestrian links and other transport connections.

BAC will only consider commercial development where it does not compromise aeronautical infrastructure, which BAC recognises as a primary outcome.

The intensity of growth in the two terminal sub-precincts is substantial, creating considerable building density in these areas. As a result, particular care is being taken to ensure that buildings on Brisbane Airport are relevant and contemporary. Materials and colours that repel heat and solar gain and reflect the surrounding landscape are favoured along with low pitch roofs.

Wherever possible, building design will also provide for suitable micro climates between the buildings for external relaxation. The sea breezes from Moreton Bay can be readily encouraged through building and landscaping design within the airport precincts.

6.4 Utilities

BAC owns and operates a substantial utility network, which includes electrical, potable and recycled water, sewer and telecommunications. In total the combined utility network amounts to around 1,000 km of installations, which is equivalent to the distance between Brisbane and Sydney.

The general plan for significant elements of the utility network is shown as Figure 6.5.

As the utilities and services provider for the airport, BAC is responsible for:

- » Building and maintaining the water, sewer, communication and electricity infrastructure
- » Delivering a safe, compliant and reliable electricity and water supply to the airport community
- » Protecting public health and the environment through the provision of reliable services.

To put the scale of this network in context, in 2013 BAC:

- » Delivered approximately 170 gigawatt (GW) hours of electricity to airport facilities and tenancies
- » Supplied around 680 megalitres (ML) of potable water to facilities and tenancies
- » Supplied around 200 ML of recycled water through the extensive recycled water network
- » Removed approximately 550 ML of sewage and waste generated by 21.6 million passengers and multiple trade waste customers.

KEY OBJECTIVES

In planning, constructing and maintaining utility services, BAC applies key objectives including:

Reliability, redundancy:

- » Ensure the operation and growth of BAC distribution networks meets the required future demand and continues to improve network performance
- » Reshaping the network to allow for supply flexibility and timely investments
- » Maintaining data integrity through a metering system, which then informs the distribution network models and adds to enhanced decision-making.

Stakeholder relationship management:

- » BAC actively engages with the utility suppliers to plan for the airport's needs and ensure that the key objectives are addressed by the utility providers' future planning
- » BAC establishes solid relationships with the local, state and federal governments and delivers on its legal, compliance and corporate governance obligations.

Sustainability:

- » Harnessing technological changes offered by suppliers and industry to augment and upgrade the network
- » Develop and deliver on plans to present environmentally sustainable solutions in energy and water use
- » Promote energy efficiency and sustainability by marketing and encouraging tenants to adopt sustainable measures in their operations
- » Offsetting peak energy usage by adopting measures such as self supplying on site power through the use of stand-by generators.

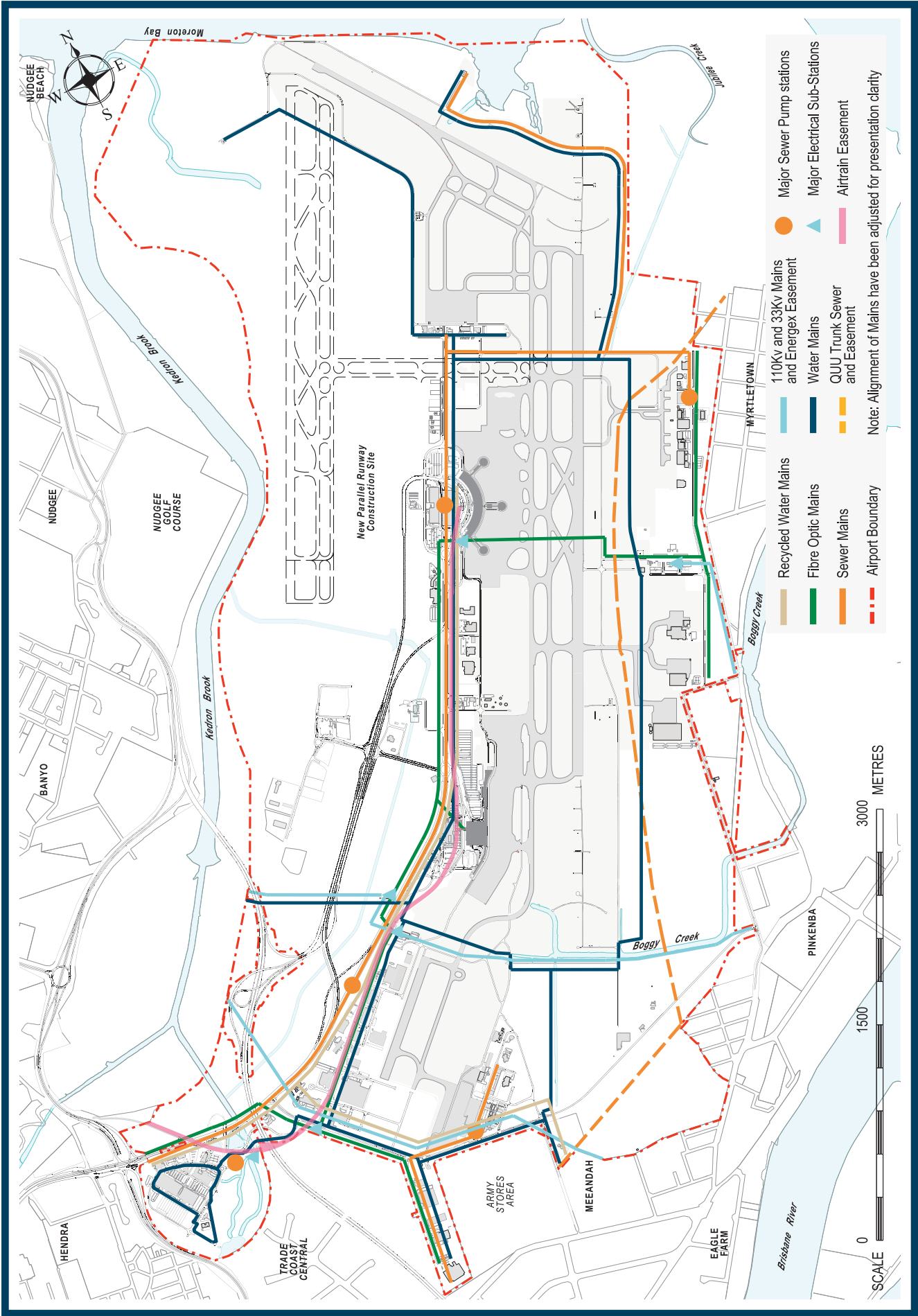
HISTORICAL (2009 – 2014)

Since the 2009 Master Plan, BAC has actively continued to plan, develop and maintain the utilities network across the airport, to ensure that it operates and responds reliably and grows in a proactive manner.

BAC's achievements include:

- » Commissioning of an upgraded major electricity intake substation
- » Installation of over 15 padmount distribution transformers and 10 km of 11 kVA cables
- » Managed through network upgrades an increase of recycled water use from 81 ML per year to more than 200 ML per year

FIGURE 6.5: EXISTING MAJOR UTILITIES AND EASEMENTS



Rainwater tanks near International T1



- » Harnessed the power of the sun through installation and commissioning of solar electrical power generation units of 99 kW and 132 kW
- » Saved more than 13.7 gigawatt hours of energy through energy technology and development sustainability initiatives
- » Established solid relationships with the state and federal governments
- » Implemented new technology street lighting, which reduces power consumption and increased asset life
- » Investigated new technologies to convert waste to power generation and commissioned feasibility studies on projects such as tri- and co-generation and bulk photovoltaic energy supply.

CURRENT PLANNING CONSIDERATIONS

With BAC's vast land holding, accessing new sites and providing utilities to service developments is a challenging task. Through the key objectives, BAC plans to maintain and continually operate a reliable and efficient service, and plans to accommodate the

forecast growth through active utility programming and delivery.

A summary of BAC's utility network and supporting utility supplier's arrangements are outlined in this section.

ELECTRICAL NETWORK

BAC's electricity network is underpinned by a robust Energex 11 kilovolt / 33 kilovolt (kVA) supply joining to three major intake substations:

- » Airport Intake Substation
- » Lomandra Drive Intake Substation
- » Pandanus Avenue Intake Substation.

From these sites, BAC operates and maintains the on airport 11 kVA networks reticulated to substations, then to individual points of supply.

Additionally, the network is supported through stand-by generators, capable of maintaining essential airport operations in the event of a mains supply outage.

In 2013, BAC reticulated around 164 gigawatt hours per year, with peak loads reaching up to 32 megawatt per hour.

Energex maintains two major 110 kVA network lines across the airport, which are within easements. These are both crucial to the airport and the greater Australia TradeCoast areas' ongoing energy supply demands and reliability. The 110 kVA lines service the Myrletown zone substation and the Meeandah zone substation, which benefit businesses in adjoining areas such as Port of Brisbane, Myrletown and Eagle Farm.

BAC has service agreements in place with Energex for future planning and a supply strategy to ensure that electricity demand associated with the future growth of airport is supported.

POTABLE WATER

BAC's potable water network is supplied by dual major intakes provided by QUU originating from the Bartley's Hill supply reservoir connecting to Sugarmill Road. The network, which is reticulated across airport via a network of pipes and valves, is owned and managed by BAC.

Due to the corrosive local coastal environment and high water table, pipes installed in ground are of a suitable material to ensure long serviceability and network reliability, with some older and susceptible pipe installations part of BAC's ongoing replacement program. A secondary water supply from Nudgee, originating from the Aspley reservoir, has been decommissioned due to unstable ground conditions and pipe deterioration. However, BAC plans to reinstate an alternate secondary point of supply in the future.

As at 2013, the potable water pipe network carries up to 680 ML of water per annum, with peak demand up to 2.1 ML per day.

In 2013 BAC supplied around 200 megalitres of recycled water across the airport through the extensive recycled water network.

RECYCLED WATER

Similar to the potable water supply, recycled water supply is provided by QUU through a dedicated line originating from the Gibson Island treatment plant. This service also provides recycled water to Royal Queensland Golf Club as well as some industry developments in Eagle Farm prior to connecting at the airport boundary, at Sugarmill Road.

From this supply point, BAC owns and manages a recycled water network that supplies class A recycled water to several sites including the International T1 and Domestic T2 terminals.

Through a series of on-site storage tanks, chlorination points, and nano-filtration plants, the recycled water is treated and reticulated to service air conditioning plant at the terminals. Additionally it provides for landscape irrigation, developments across airport that are dual plumbed for uses such as toilet flushing, irrigation, water for car washing and for construction activity such as dust suppression.

Two freshwater lakes located at the Skygate precinct supplement the recycled water supply by benefitting landscape irrigation during the hotter months.

On average, the recycled water network carries 500 kilolitres per day, limited by the point of supply, however BAC intends to access additional recycled water for future needs.

SEWER

Through a combination of gravity and rising mains supported by pump stations, BAC's sewer network is connected to the off-airport QUU sewer network at four locations, being Airport Drive (connecting to Nudgee Road), Viola Place, Lomandra Drive and Pandanus Avenue (connecting to Luggage Point).

These separate discharge points have the benefit of allowing a level of redundancy by design where re-routing of on airport sewer can occur in the event of a line or mains failure.

In 2013, the combination of uses across airport generated up to 550 ML of effluent with a peak daily discharge of up to 1.7 ML.

TRADE WASTE

As part of its sewerage services, BAC manages, using the sewerage system, the discharge of trade waste from airport business premises to the QUU sewerage network. In 2013, approximately 170 ML of trade waste was discharged from airport businesses to the QUU network.

Trade waste is managed through a series of pits and tanks, held, and then either extracted or discharged through to the sewer network. Waste from aircraft is collected via tankers and then transported to a special waste disposal unit located airside, which manages the transfer of the effluent prior to discharge into the sewer network.

RELATIONSHIPS WITH PROVIDERS

Various Energex and QUU service easements are located across the airport which either directly service the airport or the surrounding region. Figure 6.5 shows the location of these easements.

TELECOMMUNICATIONS

Brisbane Airport has a complex telecommunications network which services a variety of functions including telephony, data transfer and via relationship agreements with Airservices Australia, assists in aviation management systems.

BAC owns and manages an optical fibre infrastructure network to service its own requirements, as well as an extensive duct and access pit network to allow for telecommunications carriers to provide for the needs of their customers.

Telecommunication carriers such as Telstra, Optus and Vodafone own and maintain an array of telecommunication towers and antennae to ensure mobile network coverage is kept to a high standard across airport.

Telstra and Optus maintain some in-ground ducts and pits and provide direct to business connections. Telstra also maintains an exchange on-airport, which services the majority of their local network coverage. The area for this site and others including access to BAC duct and pit infrastructure benefitting the carriers are provided under lease and license arrangements.

BAC infrastructure is available to provide data and voice services for other carriers, tenants and agencies through BAC's nominated telecommunications carrier – Pivit. Services offered by Pivit are the same as those offered by other telecommunication carriers with the exception of mobile phone coverage. Pivit uses BAC's infrastructure to provide services to customers through licensing arrangements.

As the National Broadband Network (NBN) project continues its rollout of services across Australia, Brisbane Airport has been identified as a project site. BAC continues to discuss adoption of NBN to secure the high-speed service for current and future customers.

GAS SUPPLY

As at 2014, Brisbane Airport is not serviced by gas mains, however BAC is continuing negotiations with gas suppliers and distributors for the provision of a natural gas main to airport.

Notwithstanding the above, several businesses that rely on gas supply currently have their needs accommodated by gas cylinders or tanks located on premises. However, it is the future intent to manage their demands from a dedicated gas supply reticulated from a mains network.

UTILITIES DEVELOPMENT STRATEGY

The supply requirements of energy, water, sewer services, telecommunications and gas are expected to increase consistent with the rate of development.

The increasing rate of development is expected to place pressure on BAC's infrastructure capacity with substantial network upgrades required to accommodate increasing demands.

However, with the rising cost to supply services and maintain infrastructure, sustainable measures will be considered and adopted if feasible to add capacity.

BAC takes its challenge to the reliability, redundancy, sustainability and relationship management response seriously, with a dedicated team actively planning and managing the utility network and continually researching methods to provide a sustainable utility network. Additionally, the team actively engages across airport to explore options where existing and new developments can be designed to implement sustainable measures.

Over the period 2014 to 2019 and beyond the 20 year planning horizon of this Master Plan, BAC will invest resources and capital expenditure towards augmenting, upgrading and maintaining the utilities network. The following sections of the 2014 Master Plan detail the utilities development strategy.

FIVE-YEAR ELECTRICAL DEMAND

The allocation of the forecast loads in the 2014 – 2019 planning period has highlighted that a number of feeders will approach their rated capacity therefore additional feeders will be required to sustain development.

In particular, additional feeder capacity will be required from the Pandanus Avenue Intake Station to the Terminal Services Building (TSB) at Domestic T2, and additional feeders will be required in the Airport Central Export Park precincts.

It is expected that the electricity demand to 2019 will be as shown in Table 6.13. Table 6.14 highlights the additional electrical load for each precinct anticipated as a result of developments in those precincts.

Collaborative planning with Energex will continue to secure supply of electricity to airport.

ELECTRICAL NETWORK 2014 – 2019 DEVELOPMENT PLAN

BAC will plan for upgrades of its 11kVA network, but with a focus on green energy initiatives to potentially reduce the loads placed on the external feeder networks.

Projects include:

- » Additional transformer capacity and associated feeder work to accommodate growth in the International T1, Domestic T2 terminals and developed precincts such as Airport South, Airport East and Airport Central
- » Installation of additional substations to support developments
- » Connecting intake substations to allow re-balancing of the network and maintain resilience during peak loads
- » Upgrading the Lomandra Drive Intake Substation as contemplated in planning agreements with Energex

TABLE 6.13: FIVE-YEAR FORECAST INTAKE SUBSTATION LOADS IN MEGAVOLTS

Substation	2014 Max. Load	2014 Capacity	2019 Max. Load	2019 Capacity Required
Airport Intake Substation (33 kVA)	17.2	25	25.5	25
Lomandra Drive Intake Substation (11 kVA)	7.6	12	11.3	25
Pandanus Intake Substation (11 kVA)	11.3	12	20	25

TABLE 6.14: FORECAST POWER LOADING BY PRECINCTS FOR 2014 – 2019 PLANNING PERIOD

Precinct	Additional (kVA)
Airport Central	18,500
Airport North	100
Airport South	3,000
Airport East	140
Airport West	500
Airside	400

- » Upgrade switchboard equipment in the TSB at Domestic T2 to meet local distribution requirements
- » Extend the 11 kVA network to service new development in Airport South, Airport Central and Airport North
- » Operating existing generators during to peak period to offset network loads
- » Constructing Central Energy Plants (CEP) to support terminal growth at Domestic T2
- » Subject to mains gas availability, an analysis of the feasibility for installation of a tri- or co-generation plant at either Airport Central or Domestic T2 to support developments.

ELECTRICAL NETWORK PLAN POST 2019

After 2019 BAC will continue to develop its 11kVA network with a view to reduce loads through the application of open energy initiatives by adopting sustainable measures which are a cornerstone of BAC's Sustainability Charter outlined in Chapter 13 – Airport Environment Strategy (AES). Some key measures include:

- » Completion of a ring main connecting the intake feeder substations to maintain network resilience
- » Roll out of substations to support developments
- » Extending the 11 kVA network to service new developments
- » Investigating the opportunities to create a fourth intake substation supplied from the 110/33 kVA adjacent network

- » Investigating opportunities to construction additional tri- or co-generation plants supplemented by gas mains or use of biogas options
- » Investing in additional solar power generation including opportunities to store and reuse energy.

WATER DEMAND

it is expected that potable water consumption will increase in line with development and passenger growth.

Table 6.15 highlights the forecast consumption of potable water to 2019.

The current supply from QUU is via dual trunk mains supplied directly from the Bartley's Hill reservoir. Based on the current forecast demand this supply point is capable of servicing the airport as the primary point of supply up to 2031.

While the existing point is capable of meeting BAC's long term water needs, ongoing planning discussions are continuing on reliance of Bartley's Hill.

An additional supply source is proposed to increase supply reliability from the one point of supply and provide an additional level of system redundancy.

WATER NETWORK FIVE-YEAR DEVELOPMENT PLAN

The existing water network is capable of supplying potable water to meet demands for normal operation past 2019. To maintain fire flow conditions some augmentation plans will be implemented to solve deficiencies in firefighting capacity that may exist at dead end or small diameter mains.

Over the period from 2014 to 2019, BAC will plan for upgrades of its potable water network, but with a sustainable theme to reduce potable water consumption. Projects and planning required include:

- » New connecting pipes to service dead end and replacement of small diameter mains to maintain a consistent fire flow
- » Construction of new mains to service developments in Airport Central, Airport South and Airport North

1 BAC invests in power to support airport growth.

2 Natural light is used to complement energy sources.

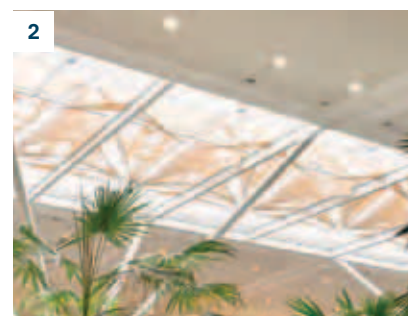


TABLE 6.15: FIVE-YEAR FORECAST POTABLE WATER CONSUMPTION

Supply Point	2014 ML/Year	2019 Additional ML/Year	2019 Total Projection ML/Year
QUU Sugarmill Road	721	491	1,212

TABLE 6.16: FIVE-YEAR FORECAST SEWER DISCHARGE

Discharge Point	Current L/Sec	2019 Additional L/Sec	2019 Total Projection L/Sec
Luggage Point	42.6	27.5	70.1
Nudgee Road	35.8	24.4	60.2
Viola Place	10.4	8.0	18.4
Lomandra Drive	0.1	Less than 0.1	0.2

- » Investigation of a new external supply connection and potable water main to supplement existing and augment network resilience and reduce the risk of a single point of supply
- » Continued roll out of BAC's water network metering plan.

WATER NETWORK PLAN POST 2019

After 2019, BAC will continue to develop its potable water network with a view to balance demands by adopting sustainable measures aligned with BAC's Sustainability Charter outlined in the AES. These measures include:

- » Onsite storage tanks to maintain and boost peak demands
- » Upgrade and maintenance of older network mains
- » Ongoing roll out of BAC network metering plan to manage water consumption and provide information for tenants on precinct water consumption
- » Supplementing the single water main connection with a secondary potable water main to airport
- » Extension of the potable water network on airport to service new developments.

SEWER DEMAND

BAC's sewerage network is split across several catchments, with flows north of the International T1 and along Pandanus Avenue discharged directly to the Luggage Point sewer treatment plant. Flows collected at the International T1, part of Airport South (Export Park) and Airport Central (Skygate) precincts discharge to the Nudgee Road outlet.

Airport South (Da Vinci) precinct is being discharged to the Viola Place outlet and the balance then discharged at the Lomandra Drive outlet point.

Table 6.16 highlights the additional loads forecast as a result of continued airport growth over the period 2014 – 2019.

The catchment serviced by the Nudgee Road discharge point is predicted to grow significantly and will exceed its allowable limit under Peak Wet Weather Flow (WWF) conditions by 2021.

As there are limitations on the Nudgee Road discharge point dictated by the external network, plans will be developed to divert flows from this location to an alternate catchment.

SEWER NETWORK FIVE-YEAR DEVELOPMENT PLAN

Over the period 2014 to 2019, BAC will plan for upgrades of its sewer network. Projects and planning required include:

- » Upgrade of sewer pump stations and rising mains to direct existing and new developments across catchments which have spare discharge capacity

- » Investigation of local sewer treatment plants to supplement the existing recycled water network
- » Installation of gravity and rising mains to service new developments.

SEWER NETWORK PLAN POST 2019

After 2019, BAC will continue to develop its sewer network with a view to reduce discharges by adopting sustainable measures and include:

- » Increase storage capacity at main pump stations to support ongoing development and address expected WWF increases
- » Installation of local sewer treatment plants which supplement the expanding recycled water network
- » Installation of gravity and rising mains to service new developments.

RECYCLED WATER DEMAND

The recycled water network is supplying an estimated 1,260 kilolitres per day during peak operation.

In 2013, the incoming supply to BAC's network was limited by infrastructure connections from Gibson Island treatment plant to the first point of supply at Royal Queensland Golf Course.

The demand for recycled water on-airport exceeds supply during peak consumption periods, which is generally during summer peaks when the air-conditioning cooling towers are operating at full capacity.

RECYCLED WATER FIVE-YEAR NETWORK PLAN

Over the five-year period 2014 to 2019, BAC will plan for upgrades of its recycled water network. Projects and planning required include:

- » Increased tank storage capacity at Sugarmill Road and Lakeside Drive to buffer against daily peak demands
- » Investigations to connect to the Luggage Point treatment plant Class A supply to augment the Gibson Island supply
- » Investigations to upgrade infrastructure thereby increasing available supply from the Gibson Island treatment plant
- » Extension of the recycled water network to service new developments
- » Investigation and trial of ground water to supplement the recycled water supply through bore water extraction.

RECYCLED WATER NETWORK PLAN POST 2019

After 2019, BAC will continue to develop its recycled water network with a view to reducing dependency on potable water supply and encourage use of recycled water where permissible. Projects for future development include:

- » Installation of local sewer treatment plants which supplement the expanding recycled water network
- » Investigation for connection to the Western Corridor Recycled Water Network Plant (currently in decommissioning phase)
- » Extension of the recycled water network to service new developments
- » Extension of the recycled water network and nano-filtration technology to service terminal and other air-conditioning plant.

TELECOMMUNICATIONS

The projected growth and the expectation for continued improvement in network reliability and performance will trigger expansion and upgrading of BAC's fibre optic network. Additionally as the dependency on mobile devices grows, telecommunication carriers such as Telstra, Optus and Vodafone will be requested to improve the level of service offered to their clients.

TELECOMMUNICATIONS FIVE-YEAR NETWORK PLAN

Over the five-year period 2014 to 2019, BAC will plan for upgrades of its telecommunications network. Projects and planning required include:

- » Upgrade to communications rooms and cabinets in buildings and across the airport
- » Extend BAC's fibre network as new land and building developments arise
- » Continue engagement with the Federal Government and NBN Co. to secure access to the NBN.

TELECOMMUNICATIONS NETWORK PLAN POST 2019

After 2019, BAC will continue to develop its telecommunications network with a view to managing access in BAC supplied conduits for telecommunications carriers to operate their network.

BAC works closely with the telecommunication carriers to limit the presence of telecommunications towers on airport. Whilst towers are necessary to improve the level of radio frequency coverage for mobile devices, BAC maintains a strategy that requests carriers to co-share existing or new infrastructure, design towers such that they blend in with the existing landscape and locate antennae on buildings and away from publicly accessible areas.

Upgrading telecommunications at Brisbane Airport



GAS NETWORK FIVE-YEAR DEVELOPMENT PLAN

Over the five-year period 2014 to 2019, BAC will plan for gas mains supply to airport. Projects and planning required include:

- » Installation of a gas mains connecting to airport developments where gas supply is required
- » Replacement of gas tanks / bottles with connections to mains supply
- » Investigate development of a biogas facility suitable to service a tri- or co-generation plant.

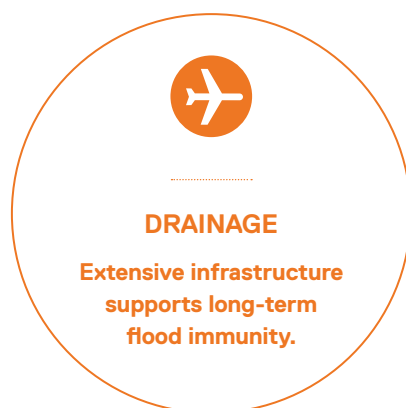
GAS NETWORK PLAN POST 2019

After 2019, BAC will continue to plan and implement the gas network to support continued development.

6.5 Drainage

Drainage across Brisbane Airport is complex due to the flat terrain and the range of flooding events resulting from catchment runoff, tidal and coastal influences. These events include local and regional flooding (Brisbane River and Kedron Brook) as well as the potential for inundation related to storm surge events.

Brisbane Airport is split into seven drainage catchment areas which cover the 2,700 hectare site and includes external feeding catchments as shown in Figure 6.6. These catchments discharge to the Brisbane River, Kedron Brook and Moreton Bay through a network of manmade or natural drainage channels, classified as either primary, such as the Kedron Brook floodway drain and Boggy Creek, or secondary such as Landers Pocket and the future secondary drain. These channels are influenced to varying degrees dependent on whether flooding is caused by regional, local or storm surge events.



If added together the combined total length of all drainage channels and culverts on-airport is around 120 km.

All major developments the airport are delivered with the appropriate drainage infrastructure to support long-term flood immunity, which is consistent with the Intergovernmental Panel on Climate Change allowance for sea level rise of 800 mm to year 2100. Adopting a risk-based approach, each new development or infrastructure element is designed to meet the immunity level suitable for its location and asset class.

Additionally, new drainage infrastructure such as the construction of major drainage channels for the NPR, which is known as the Kedron Brook floodway drain, is delivered to protect existing and future infrastructure investment. New drainage channels and existing augmented channels are maintained to provide the appropriate flood immunity to meet adopted national standards.

To manage airport safety, drains are designed to limit wildlife attraction with measures such as steep batter slopes, limited benching and selected landscape treatments employed to reduce wildlife presence in the proximity of airside areas.

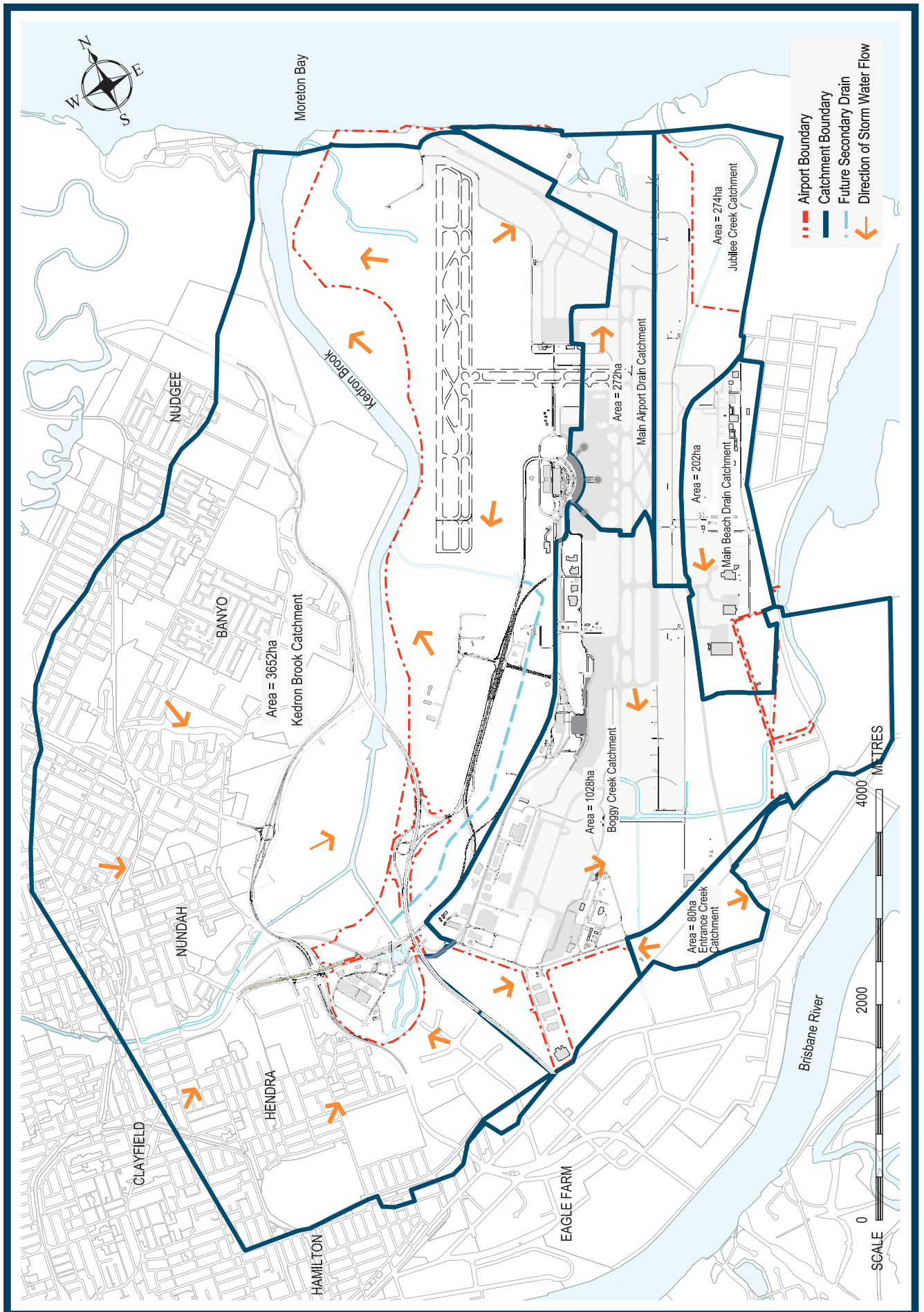
Due to its location and receiving position, BAC's drainage catchment accounts for flows transferred from upstream developments through airport drains prior to discharge into Moreton Bay. Two significant upstream catchments include the Doomben and Eagle Farm racecourse sites which connect to Battery Drain to the north of Skygate and the Trade Coast Central development site which connects to Battery and Army Drains to the north and east of Skygate respectively.

Both sites have local government development obligations imposed through approvals that require proof of no net worsening of drainage outcomes for adjoining sites, which includes Brisbane Airport. As these developments progress, BAC will continue to engage with BCC and the developers to ensure these conditions are proven and flood mitigation design is included in construction.

Apart from transferring water from development catchments and discharging into Moreton Bay, the on-airport drainage network is designed to maintain water quality standards as required by the Airports (Environment Protection) Regulations.

Through a series of measures that support water polishing, the drainage network addresses the quality of water as it is transferred from the development site through to the bay. These measures can include bio-retention systems, grass lined channels, landscaping design to trap gross pollutants, mangrove colonisation to promote ecological development and other water sensitive urban design WSUD measures.

FIGURE 6.6: DRAINAGE CATCHMENTS



HISTORICAL (PAST FIVE YEARS)

BAC invests heavily in drain maintenance and construction of new infrastructure to support the existing well-developed drain network. Additionally, BAC focuses on developing the flood immunity program to protect new infrastructure and maintain flood immunity to acceptable standards for existing infrastructure.

The performance of this approach has been proven most recently in both 2011 and 2012 during the significant Brisbane flood events. Bordered by two significant waterway corridors of Kedron Brook and Brisbane River, Brisbane Airport experienced limited and isolated flooding pockets in areas such as Airport East and around Airport Drive, which were influenced by high tide coinciding with river peaks.

According to the Queensland Floods Commission of Inquiry, the January 2011 flood was rated at an Average Recurrence Interval (ARI) of 1%* or equivalent 1 in 100 year event, which was the largest event of the two periods.

* ARI is defined as the average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration. The periods between exceedances are generally random.

During both events, BAC employed its Incident and Emergency Management Process and worked closely with BCC and the state government to share critical data on flooding progress but also to confirm with all stakeholders that operations of the airport remained unaffected.

As a testimony to its planning for flood resilience, BAC continues with projects that maintain and improve flood immunity. During the period 2009 to 2014 BAC has:

- » Updated the airport's master drainage plans
- » Updated flood studies for the NPR



1 Utility works on the site of the New Parallel Runway.

2 Site planning for utility networks.



- » Completed grading and staging studies for numerous development and infrastructure projects including the CPA, Airport South and Domestic T2 apron projects
- » Continued with localised flood immunity assessments to inform the Minimum Development Levels for land developments
- » Constructed the Kedron Brook floodway drain as part of the NPR project
- » Augmented and maintained drainage through re-grading, clearing and general maintenance
- » Constructed new drain crossings as part of infrastructure and land development projects that meet the needs of that development and forms part of the overall drainage strategy
- » Engaged with the local community to present findings and details on the outcomes of the 2011 and 2012 flooding events
- » Engaged with the local community, BCC and state government to present drainage maintenance works that maintain and improve on the level of immunity as offered by the existing topographical environment

- » Developed an interactive flood model reporting tool (Wateride) which provides flood immunity details for development sites based on location and risk profiling.

CURRENT SITUATION

All development programs undergo an analytic check to test their immunity effectiveness not only with the proposed drainage network but also their impact on the current drainage network and adjoining land developments. These assessments are extended to ensure that there is no net worsening flood effect on land upstream or downstream external to the airport.

The process includes gathering data, identifying the appropriate immunity requirements based on type, design life and location of the infrastructure or development, updating and interrogating BAC's detailed hydrology model, assessing risk inclusive of construction mitigation planning, reporting on findings then constructing to respond to a preferred drainage solution.

DRAINAGE FIVE-YEAR DEVELOPMENT STRATEGY

BAC's five-year development plan has been assessed to determine the necessary supporting drainage strategy to 2019.

As BAC's drainage network has been designed and progressively developed to the highest immunity standards for ultimate land use development scenarios since 1997, the five-year and 20-year development plans present limited upstream and downstream risks.

However, it is important for BAC to engage with BCC, state government and local communities to ensure they are informed of the network resilience and development plans as well as how the drainage network can respond.

Over the period 2014 – 2019 and beyond, BAC will continue to develop grading and staging plans for precincts and aprons, major drainage network requirements and updating the existing hydrology models to reflect updated predictions and standards similar to those as adopted by state and local governments.

All drainage studies and development reviews ensure that net benefits to the environment and the drainage networks around adjoining developed areas such as Pinkenba and Myrtletown result. BAC continues to engage with the relevant agencies and local community representatives to monitor storm and tidal events and water quality.

Over the five-year period 2014 to 2019, BAC will plan, develop and consequently expand the significant drainage network on airport.

Projects include:

- » Commencement of the secondary drain traversing Airport Central (a major new drain connecting Kedron Brook floodway to Battery Drain)
- » Upgrade to the drainage network in Airport West (Central Parking Area) and Airport South to support land development
- » Construction and upgrade of the drainage network to support the NPR site clearing and filling
- » Re-location of airside drains to support ongoing apron and other aeronautical projects
- » Ongoing maintenance of existing drains to reduce silt deposits and manage mangrove colonisation
- » Construction of road culverts in Airport Central (Skygate) and Airport South (Airport Industrial Park) to support development plans
- » Construction of tidal flaps to control water ingress to airside drains, which have the potential to remain stagnant.

DRAINAGE NETWORK PLAN POST 2019

In relation to the 20-year development strategy included in this Master Plan, BAC has evaluated the drainage network requirements which would satisfy that level of development without compromising the integrity of facility immunity standards.

As the drainage network across the airport has been established with complete future development in mind, the longer-term development strategy presents limited risk on how the airport's drains can respond. However, ongoing monitoring of design and infrastructure changes will continue to ensure that there are no net worsening effects to present and future infrastructure.

During 2011 and 2012 flood events in Brisbane, BAC shared critical flooding data with the Queensland State Government.