



JANDAKOT AIRPORT | 2020
MASTER PLAN

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FOREWORD

We are pleased to present the Jandakot Airport Master Plan 2020 which outlines the strategic direction for the efficient and economic development of Jandakot Airport for the next 20 years.

Since privatisation of the airport in 1998, our vision has been to successfully develop and manage Jandakot Airport as a strategically significant aviation hub with a supporting business campus.

Over the past 6 years, we have successfully implemented Master Plan 2014, making significant infrastructure investment to facilitate the development of the airport to achieve our vision.

General aviation does not generate sufficient income for the maintenance and development of airport infrastructure. Other income streams are therefore essential and the development of non-aviation land at Jandakot Airport provides this critical income diversity.

Master Plan 2020 retains the principle concepts of Master Plan 2014 including the provision of the fourth runway and associated taxiways, land use areas, mixed business land use areas and the general access management.

Master Plan 2020 has been prepared in accordance with the *Airports Act 1996* and is the guiding document for the development of Jandakot Airport for the next 20 years.

In preparing this Master Plan we have undertaken significant consultation with key stakeholders including Federal, State and Local Governments, aviation users and community groups.

Master Plan 2020 provides for an appropriate balance of aviation and non-aviation sectors of the airport.

John Fraser
Managing Director, Jandakot Airport Holdings

EXECUTIVE SUMMARY

Jandakot Airport is the only general aviation airport in the Perth Metropolitan Region and is an important infrastructure asset for Western Australia. The airport generates substantial economic benefits to the State economy and to the southwest region. Jandakot Airport occupies an area of 622 hectares and is located 16 kilometres south of the Perth Central Business District.

MASTER PLAN 2020

The review of Master Plan 2014 has been undertaken to meet the requirements of the *Airports Act 1996*.

Master Plan 2020 retains the principal concepts of Master Plan 2014 including the provision of the fourth runway and associated taxiways, aviation land use areas, mixed business land use areas and the general access arrangement.

AIRPORT VISION

Jandakot Airport Holding's vision is to successfully develop and manage Jandakot Airport as a strategically significant aviation hub with a supporting business campus.

REGIONAL AND ECONOMIC SIGNIFICANCE

The State Government has recognised Jandakot Airport as a vital piece of infrastructure. The *Airports Act 1996* encourages the airport to adopt a planning philosophy consistent with that of State and Local Government. Master Plan 2020 has been prepared in close consultation with relevant authorities, with the airport commercial areas adopting the City of Cockburn's planning framework.

The ongoing development and growth of Jandakot Airport will result in the sustained economic significance of the airport operations. Major capital works proposed for the future include the construction of a fourth runway, a minor extension to the primary runway, new road access to the east and continued mixed business development.

Jandakot Airport contributes both directly and indirectly to the economy of Western Australia.

FORECAST GROWTH

Jandakot Airport is one of the busiest general aviation airports in Australia in terms of aircraft movements, having averaged 215,000 movements per annum over the last three years. The airport could expect to reach the theoretical operating capacity of 460,000 fixed wing and 66,000 helicopter movements per annum within the 20 year planning horizon of this Master Plan.

AIRPORT LAND USE

The Jandakot Airport Master Plan 2020 projects the following land use and proportion of total land area:

- Conservation 119 hectares (19%);
- Aviation Operations (includes runways and taxiways and aviation development) - 257 hectares (42%);
- Mixed Business - 201 hectares (32%); and
- Roads and Services - 45 hectares (7%).

AVIATION DEVELOPMENT

The planned configuration of the airfield at the ultimate development of the airport includes the following potential new works:

- The proposed fourth runway 12L/30R, which is to be 990 metres in length and 18 metres wide, located parallel to the existing runway 12/30;
- The extension of runway 06L/24R from 1,392 metres to 1,600 metres; and
- The augmentation of the existing taxiway system to support the runway developments.

AIRPORT SAFEGUARDING

Land has been reserved for growth in aviation support facilities. Safeguarding systems such as airspace protection, restrictions to external lighting, bird and animal hazard management and public safety are outlined in the Master Plan.

NON-AVIATION DEVELOPMENT

A development strategy for the airport's non-aviation land has been established. The non-aviation precincts proposed are broadly consistent with the City of Cockburn's mixed business use, Directions 2031, Perth and Peel @3.5 Million, and State Planning Policy Activity Centres for Perth and Peel which recognise Jandakot Airport as a 'Specialised Activity Centre'.

The development of non-aviation land is critical to the future delivery of aviation and environment outcomes on the airport as the non-aviation land provides a strategic diversity of income to secure the sustainability of the airport.

GROUND TRANSPORT PLAN

Access to Jandakot Airport is via the following connections:

1. Existing access from Karel Avenue/Berrigan Drive intersection currently being upgraded to a dual lane roundabout;
2. Existing access from Berrigan Drive via Spartan Street (left in/left out only at Berrigan Drive);
3. Existing access from Pilatus Street via Jandakot Road/Berrigan Drive/Dean Road/Pilatus Street signalised intersection; and
4. Proposed East Link road - consultation with State and Local Governments has resulted in a plan to connect to Johnston Road and through to Ranford Road. JAH proposes to extend Orion Road to meet Johnston Road at the boundary of the airport.

SERVICES INFRASTRUCTURE

JAH has invested significantly in the upgrading of services and infrastructure on the airport and will continue to do this to meet the needs of aviation and non-aviation development within the airport.

ENVIRONMENT STRATEGY 2020

In accordance with the *Airports Act 1996*, the Environmental Strategy 2020 for the Jandakot Airport has been updated in this Master Plan and will act as a guide for environmental management of the airport for the next eight years.

STAKEHOLDER AND COMMUNITY CONSULTATION

Consultation with key stakeholders including airport tenants, State and Local Government and community groups was undertaken during the preparation of Master Plan 2020.

IMPLEMENTATION

Master Plan 2020 will be implemented in a staged manner driven by demand. A review of this Master Plan will be required in 8 years.

I. INTRODUCTION

I.1 JANDAKOT AIRPORT

Jandakot Airport is the main general aviation airport in Perth and is one of the busiest airports in Australia in terms of aircraft movements. The airport operates 24 hours a day, 7 days a week, and is vital to the local and regional economy of Western Australia as it provides facilities for tourism, pilot and aviation training, general aviation, services to resource and pastoral sectors and important emergency services such as the Royal Flying Doctor Service, Police Air Wing, RAC Rescue Helicopter and WA Department of Fire and Emergency Services bushfire response.

Jandakot Airport is a Certified Airport under the Civil Aviation Safety Authority Manual of Standards (MOS) Part 139 - Aerodromes.

I.2 OWNERSHIP OF JANDAKOT AIRPORT

Jandakot Airport is located on Commonwealth Government land.

On 1 July 1998 the Commonwealth Government sold a 50 year lease over Jandakot Airport, with an option of a 49 year lease extension, to Jandakot Airport Holdings Pty Ltd (JAH).

I.3 SITE CONTEXT

Jandakot Airport is located 16km south of the City of Perth and 13km east of the Port of Fremantle. The 622 hectare site is within the boundary of the City of Cockburn. The northern boundary of the airport abuts the City of Melville and the north east airport boundary abuts the City of Canning. Jandakot Airport is in close proximity to major population and commercial/industrial areas, providing easy access to the aviation and non-aviation businesses located at the airport. The Jandakot Airport estate in an aerial photograph context is shown in Figure I.1.

I.4 AIRPORT HISTORY

Plans for Jandakot Airport began in the mid-1950s when it became clear that the capacity and infrastructure of the Maylands Aerodrome was insufficient for the growth in air traffic. Light aircraft operations had continued at Maylands following the relocation of civilian aircraft services to the Guildford Aerodrome (now Perth

Airport) in 1946, but within a decade the aging infrastructure at Maylands was not able to support the light aircraft requirements. Land acquisition for a new general aviation airport began in 1959, with 520 hectares of unproductive farmland in Jandakot acquired before the official opening of Jandakot Airport on 1 July 1963. Over the next 11 years the land size was increased to 622 hectares.

Pilot training has been a main focus at Jandakot Airport since 1965 when the Royal Aero Club of WA (RACWA) relocated to Jandakot from Guildford Aerodrome. RACWA was, and continues to be, the largest pilot training organisation in WA. Jandakot Airport has been utilised for overseas pilot training since the 1970s, with the Aviation Academy of Australia set up to train Air Malawi and Air Zimbabwe pilots and RACWA training Singaporean pilots on a regular basis. In the early 1990s dedicated accommodation and training facilities were constructed on the airport for Singapore Flying College and China Southern WA Flying College. Pilot training activity currently constitutes 80% of all aircraft movements at Jandakot Airport.

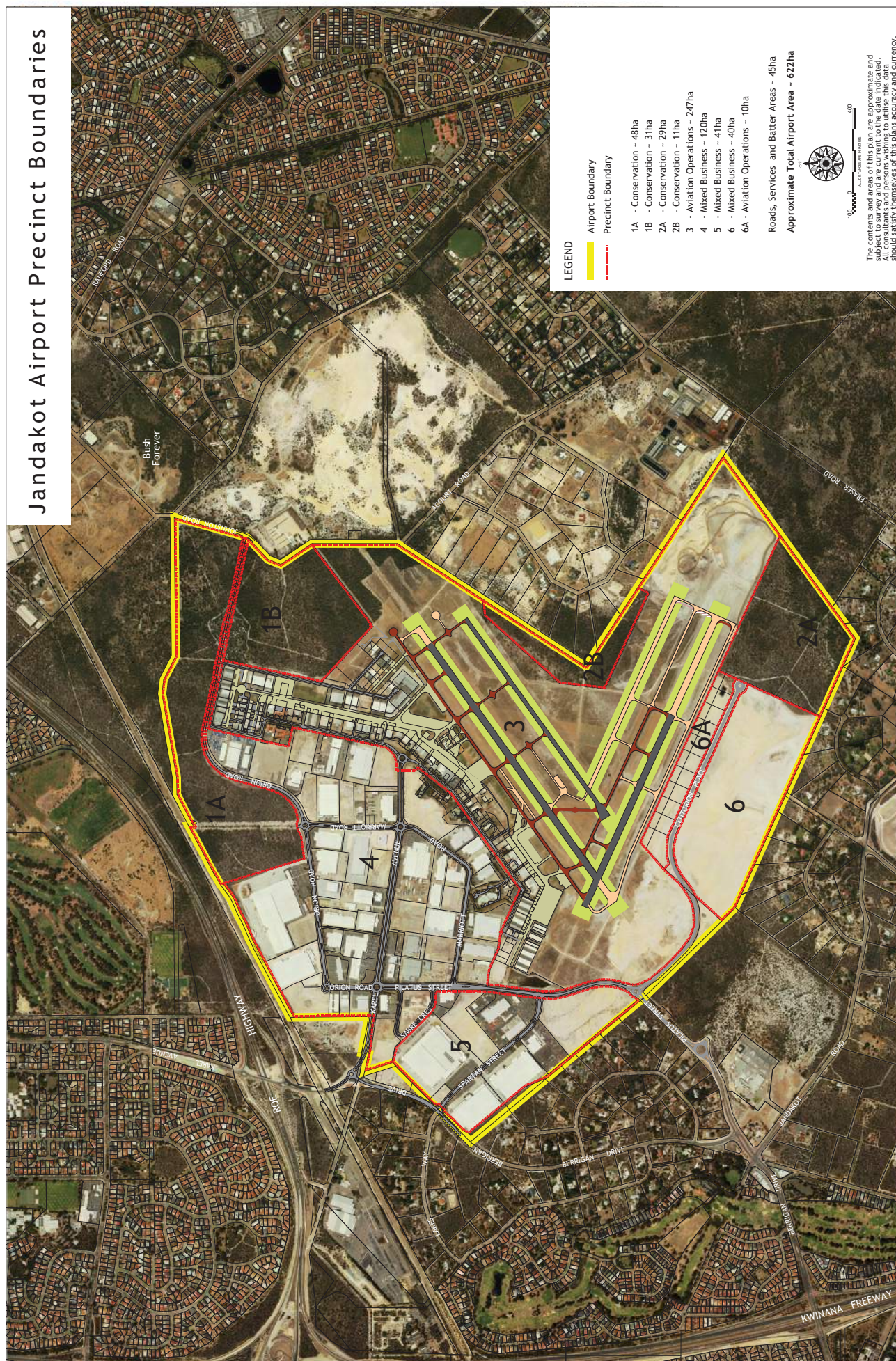
The role of Jandakot Airport as a major aviation training facility was further enhanced in 2010 when South Metropolitan TAFE redeveloped its Aerospace Training Centre at the airport. In addition to pilot studies, the Aerospace Training Centre provides courses in engineering and aircraft maintenance, ground and cabin crew operations, and airport management.

I.5 PROXIMITY TO OTHER AIRPORTS

Jandakot Airport is situated 19km south-west of Perth Airport, the domestic and international airport serving Perth. The appeal for commercial pilot training activity at Jandakot Airport is largely as a result of the close proximity to Perth Airport, as pilot training and licensing curriculum require students to be able to fly in and around controlled airspace and have access to a variety of suitable navigational aids.

Serpentine Airport is a small airfield situated 30km south of Jandakot. It has one sealed runway and one grass runway and is used primarily for glider and sports aircraft. The airport is unsuitable for commercial pilot training activity due to the short runways and lack of navigational infrastructure.

FIGURE I.1 - JANDAKOT AIRPORT AERIAL PHOTOGRAPH CONTEXT



Rottneest Island Airport is a small single-runway airfield servicing the holiday island. Located 34km west of Jandakot, it is used regularly for private operator and charter operations ferrying workers and holiday makers between Perth and Rottneest Island.

Murray Field Airport is a small airfield located 46km south of Jandakot near the suburb of Mandurah. It is owned and operated by the Royal Aero Club of WA. With one sealed and one gravel runway, it is used primarily for pilot training and private operator use. The limited facilities and lack of navigational infrastructure restrict its use for commercial pilot training activity.

Pearce RAAF Base is located in Bullsbrook, 49km north of Jandakot, and is the main Royal Australia Air Force (RAAF) base in WA. Its primary role is pilot training for both RAAF and Singapore Air Force and it is the busiest RAAF base in Australia in terms of total movement numbers. Civilian aircraft access to the airport is very limited and the airspace surrounding Pearce is restricted military airspace.

RAAF Gingin is a small airfield that is also owned and administered by the RAAF. It is located approximately 40 km north of RAAF Base Pearce and 70km north of Jandakot Airport, and is used mainly for RAAF pilot training.

Bunbury Airport is located 142km south of Jandakot Airport. It has a single sealed runway and is used for general and recreational flight training as well as charters and emergency services.

Busselton Airport is located on the South West coast 180km south of Jandakot. Due to residential developments adjacent to the airport, the City of Busselton has imposed stringent controls on the use of the airport for flight training purposes.

The location of Jandakot Airport in proximity to other airports is shown in Figure 1.2.

1.6 ECONOMIC SIGNIFICANCE OF JANDAKOT AIRPORT

Jandakot Airport is a significant infrastructure asset in Western Australia and generates substantial economic benefits to the State and local economy.

The airport's location has several natural advantages that make it a preferred location for:

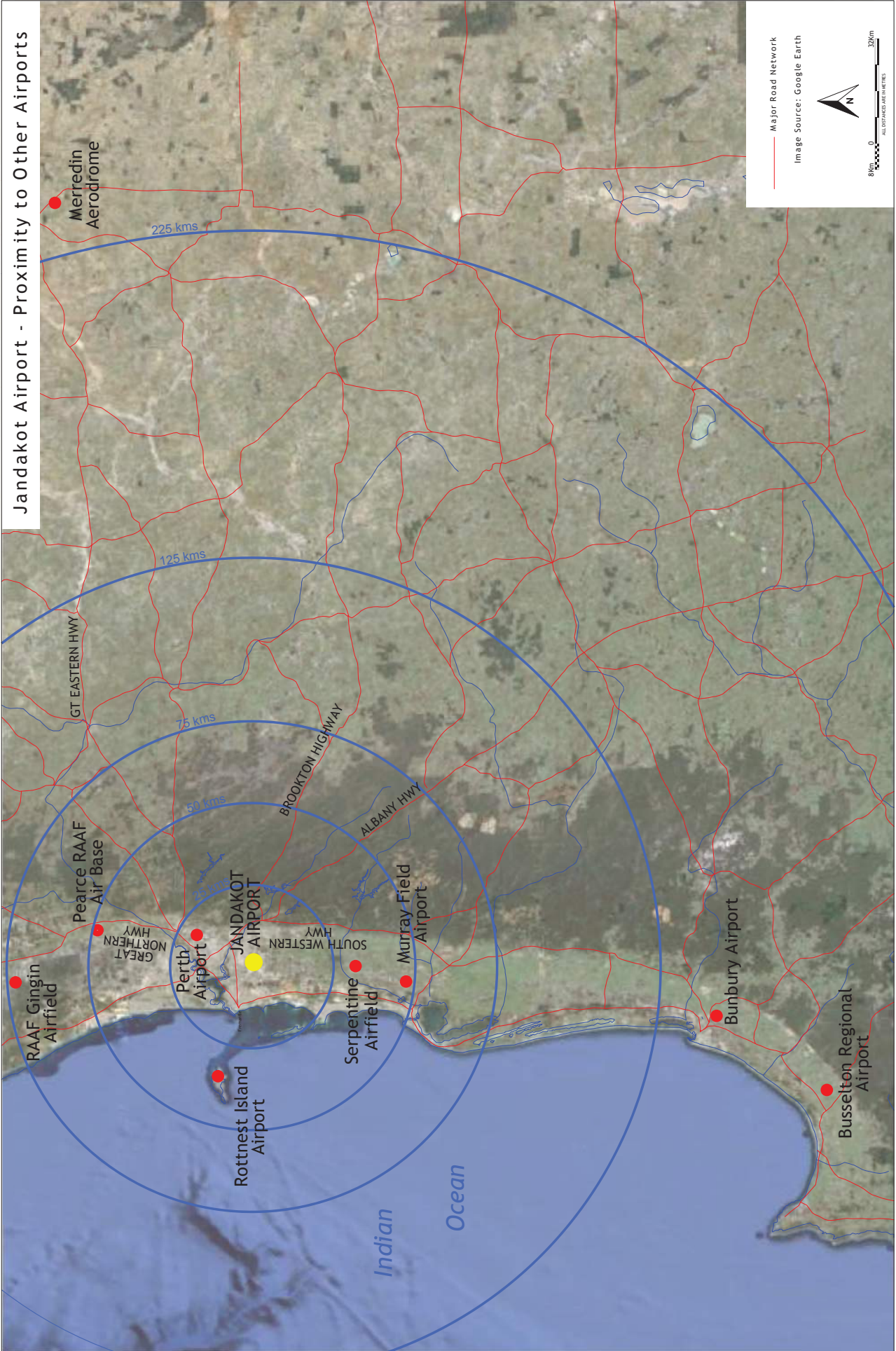
- Pilot training for domestic and international students;
- Servicing the general aviation needs of the metropolitan area, being just 16km south of the Perth CBD;
- Supporting the State's regional and remote areas with charter air transport services to the minerals and petroleum sectors;
- Servicing the public safety and emergency needs of the State through emergency air transport services;
- Capitalising on Western Australia's strong ties, geographical proximity and time zone correspondence to Asia; and
- Taking advantage of very favourable climatic conditions and long daylight hours that allow relatively long periods of flying time.

As a result of these advantages, Jandakot Airport has been able to capitalise on the international demand for flight training facilities. The flying schools based at the airport provide substantial export revenue to the State as well as relationship and reputation benefits from the long-term association with major international aviation businesses, including Singapore Airlines, and previously China Southern Airlines.

The development of the mixed business precincts over the past fourteen years has attracted leading-edge firms to the airport site and generated a number of spinoff service industries such as air tourism and safety training.

Jandakot Airport currently has an estimated 115,000 square metres of aviation related and aircraft hangar floor space, and an estimated 455,000 square metres of non-aviation floor space, of which approximately 330,000 square metres is warehousing, 80,000 square metres is manufacturing space, 40,000 square metres is office space and 5,000 square metres is retail space.

FIGURE 1.2 - LOCATION AND PROXIMITY PLAN



The current (2016) economic contributions of Jandakot Airport are summarised in Table 1.1:

Table 1.1 Current Economic Significance of Jandakot Airport

Number of businesses on site	213
Aviation Related Employees (Direct)	850
Non-Aviation Related Employees (Direct)	2276
Payroll	\$213.700 million
Payroll Tax	\$11.7 million
Ex-gratia payment in lieu of rates to the City of Cockburn (2018)	\$4.0 million
Export revenue international students	\$92.3 million
Total taxation revenue (excluding GST and taxes on profits)	\$39.0 million

Source: MacroPlan Dimasi, Jandakot Airport Holdings, Australian Bureau of Statistics 2016 Census

1.7 FUTURE ECONOMIC SIGNIFICANCE OF JANDAKOT AIRPORT

The future development and growth of Jandakot Airport will build on the already significant economic value of the airport estate. Proposed major capital works include the expansion of the aviation infrastructure.

The development of the aviation infrastructure and aviation development land in Precincts 6A will allow for additional aviation related businesses at the airport and therefore increase employment, resulting in consequential higher taxation revenues for government.

Upon the ultimate development of the Jandakot Airport estate, it is estimated that the wages and salaries generated by 7,793 employees across 480 businesses will be in the order of \$570.4 million. The following are estimates of taxes payable at full development:

- \$186.5 million per year in individual and company income tax payable to the Commonwealth Government;
- \$60.6 million per year in payroll tax and GST payable to the State Government; and
- \$19.2 million per year payment in lieu of rates to the City of Cockburn.

The total value-add or contribution to the Western Australian economy that will be generated by the construction will be in the order of \$858.5 million in addition to the initial \$319.8 million investment.

Within the eight year period of this Master Plan, the anticipated level of development is expected to employ an additional 2,028 people, generate around 452 full time annual equivalent jobs in the construction industry, and approximately \$57.4 million in construction industry salaries along with an additional \$69.1 million annually in income, payroll and company taxes and GST to Commonwealth and State Governments, and payments in lieu of rates to the City of Cockburn.

1.7.1 FUTURE AVIATION DEVELOPMENT

The proposed aviation related development at Jandakot Airport will facilitate a significant increase in the economic activity at the site. At full development, estimated within the 20 year period of this Master Plan, it is anticipated that the estate will accommodate approximately 155,000 square metres of aviation-related and aircraft hangar floor space. This increase will predominantly come from the development of Precinct 6A which will accommodate approximately 40,000 square metres of aviation-related and aircraft hangar floor space.

This construction is estimated to cost \$41.3 million and will generate substantial economic activity, including:

- 79 full time annual equivalent jobs in the construction industry; and
- \$10.2 million in wages and salaries paid to construction industry employees.

The total value-add or contribution to the Western Australian economy that will be generated by the construction will be in the order of \$110.9 million in addition to the initial \$41.3 million investment.

Upon completion, this future aviation development will generate \$15.0 million annually in income, payroll and company taxes and GST to Commonwealth and State Governments, and payments in lieu of rates to the City of Cockburn. When combined with the existing aviation uses at Jandakot Airport, the total annual contribution to all levels of government is estimated at \$59.6 million.

It is estimated that at the full development of the estate the number of aviation related businesses will be around 102, with approximately 1,741 employees.

I.7.2 FUTURE NON-AVIATION DEVELOPMENT

At full development, it is anticipated that the estate will accommodate approximately 725,000 square metres of non-aviation floor space, comprising 525,000 square metres of warehouse, 128,000 square metres of manufacturing, 67,000 square metres of office and 5,000 square metres of retail (already constructed) floor space.

The construction of the commercial estate, including the supporting infrastructure and buildings, upon full development is estimated to cost \$278.5 million and will generate substantial economic activity, including:

- 540 full time annual equivalent jobs in the construction industry; and
- \$68.6 million in wages and salaries paid to construction industry employees.

The total value-add or contribution to the Western Australian economy that will be generated by the construction will be in the order of \$747.6 million in addition to the initial \$278.5 million investment.

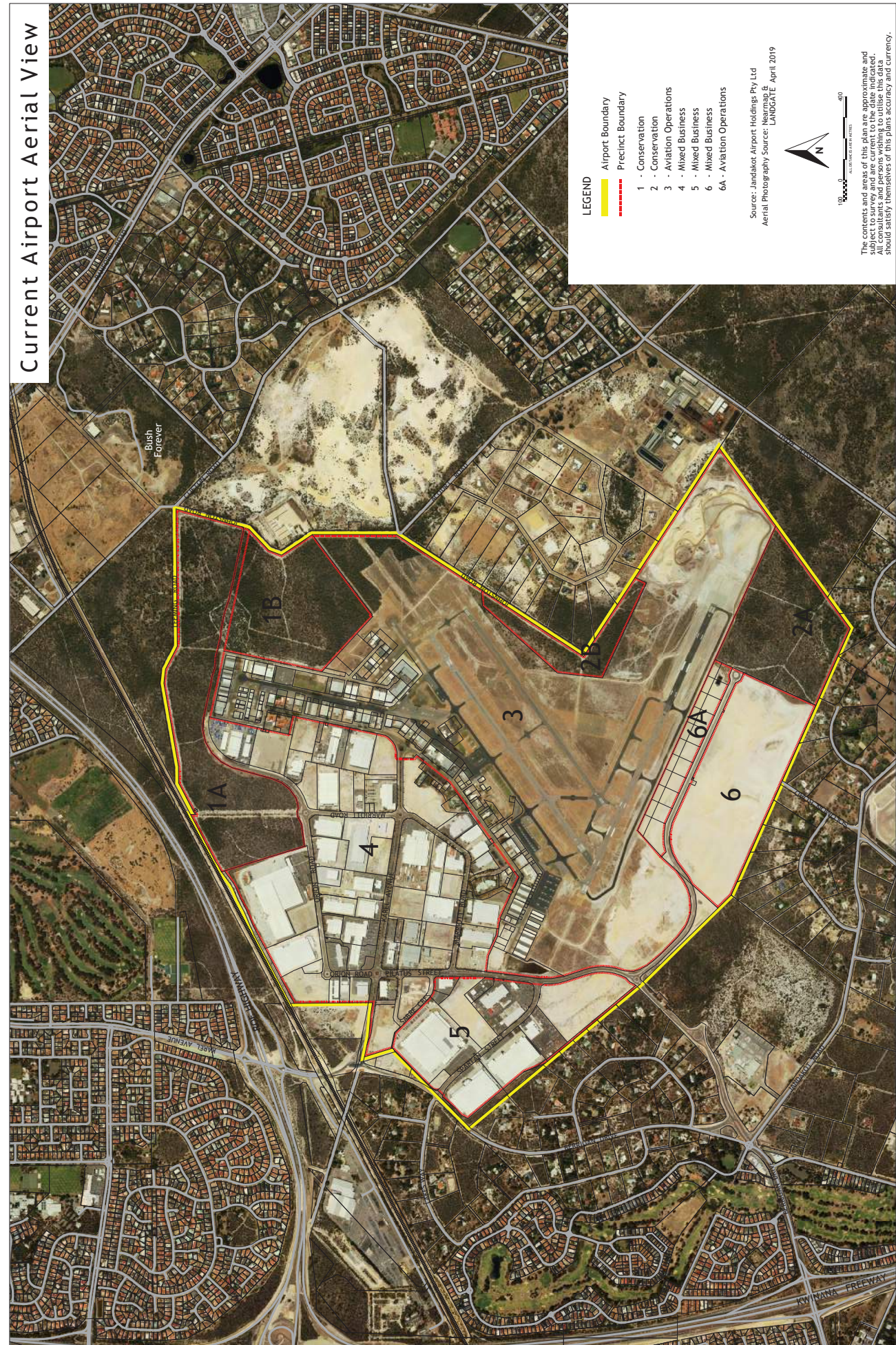
When the commercial estate is fully occupied it will have the potential to accommodate approximately 409 non-aviation related businesses with approximately 6,050 employees. Upon completion the non-aviation development (including existing and new development) will generate \$206.7 million each year in income, payroll and company taxes and GST to Commonwealth and State Governments, and payments in lieu of rates to the City of Cockburn.

I.8 DEVELOPMENT OBJECTIVES

The following objectives guide the planning and development of the airport site:

- Maintain Jandakot Airport as a leading General Aviation facility through investment in infrastructure necessary to satisfy the forecast operational requirements;
- Enhance the airport's contribution to WA employment and economic growth through appropriate aviation and non-aviation development;
- Ensure the long-term viability and sustainability of the airport and its stakeholders through effective planning, development and management; and
- Provide a safe, secure, reliable and efficient airport operating environment.

FIGURE 1.3 - AERIAL PHOTOGRAPH PRECINCT PLAN



2. PLANNING FRAMEWORK

2.1 PLANNING HISTORY

Prior to 1998 Jandakot Airport was owned and managed by the Federal Government. Initially this was through the Department of Civil Aviation, then Department of Transport (1973), Department of Aviation (1982), and finally as a Commonwealth business enterprise managed by the Federal Airports Corporation from 1988 to 1998. The Commonwealth had specific requirements for the approval and subsequent development at airports, with environmental and aircraft noise impacts of proposed developments evaluated by the State Environmental Protection Authority and/or Commonwealth Department of the Environment and Energy (or equivalent authority).

Since privatisation of Australian airports commenced in 1996, planning and environmental regulations governing airport development have been significantly enhanced and Jandakot Airport is now subject to the planning framework of the *Commonwealth Airports Act 1996*.

2.2 COMMONWEALTH GOVERNMENT

The Commonwealth Government regulatory framework relative to the planning and development of airports is established by the *Airports Act 1996* and the following key legislation and regulations:

- *Airports Regulations 1997*;
- *Airports (Building Control) Regulations 1996*;
- *Airports (Control of On-Airport Activities) Regulations 1997*;
- *Airports (Protection of Airspace) Regulations 1996*;
- *Airports (Environment Protection) Regulations 1997*; and
- *Environment Protection and Biodiversity Conservation Act 1999*.

2.2.1 AIRPORTS ACT 1996

The *Airports Act 1996* is the principal statute regulating the ownership, management and conduct of the leased federal airports. Part 5 of the Act prescribes a number of controls over land use, planning and building at airports and Part 6 details environmental management.

MASTER PLAN

Under Section 70 of the Act, each Commonwealth airport is required to produce a final master plan. A final master plan is one which has been approved by the Federal Minister of Infrastructure and Transport. Prior to submitting a draft master plan to the Minister, the airport is required to take into account public comments. Subsequent development at the airport must be consistent with the final master plan.

Section 70 of the Act requires that the purposes of a final master plan for an airport are to:

- Establish the strategic direction for efficient and economic development at the airport over the planning period of the plan;
- Provide for the development of additional uses of the airport site;
- Indicate to the public the intended uses of the airport site;
- Reduce potential conflicts between uses of the airport site, and to ensure that the uses of the airport site are compatible with the areas surrounding the airport;
- Ensure that all operations at the airport are undertaken in accordance with relevant environmental legislation and standards;
- Establish a framework for assessing compliance at the airport with relevant environmental legislation and standards; and
- Promote the continual improvement of environmental management at the airport.

A new master plan must relate to a planning period of 20 years. At the time of approval of Master Plan 2014 the Act required that a new master plan be developed every five years, however, relevant to Jandakot Airport, the Act has since been amended to require this to occur every eight years.

Section 71 of the Act requires that a master plan include:

- (a) *the airport-lessee company's development objectives for the airport; and*
- (b) *the airport-lessee company's assessment of the future needs of civil aviation users of the airport, and other users of the airport, for services and facilities relating to the airport; and*

- (c) the airport-lessee company's intentions for land use and related development of the airport site, where the uses and developments embrace airside, landside, surface access and land planning/ zoning aspects; and
- (d) an Australian Noise Exposure Forecast (in accordance with regulations, if any, made for the purpose of this paragraph) for the areas surrounding the airport; and
- (da) flight paths (in accordance with regulations, if any, made for the purpose of this paragraph) at the airport; and
- (e) the airport-lessee company's plans, developed following consultations with the airlines that use the airport and local government bodies in the vicinity of the airport, for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels; and
- (f) the airport-lessee company's assessment of environmental issues that might reasonably be expected to be associated with the implementation of the plan; and
- (g) the airport-lessee company's plans for dealing with the environmental issues mentioned in paragraph (f) (including plans for ameliorating or preventing environmental impacts); and
- (ga) in relation to the initial period of the master plan—a plan for a ground transport system on the landside of the airport that details:
 - (i) a road network plan; and
 - (ii) the facilities for moving people (employees, passengers and other airport users) and freight at the airport; and
 - (iii) the linkages between those facilities, the road network and public transport system at the airport and the road network and public transport system outside the airport; and
 - (iv) the arrangements for working with the State or local authorities or other bodies responsible for the road network and the public transport system; and
 - (v) the capacity of the ground transport system at the airport to support operations and other activities at the airport; and
- (vi) the likely effect of the proposed developments in the master plan on the ground transport system and traffic flows at, and surrounding, the airport; and
- (gb) in relation to the initial period of the masterplan detailed information on the proposed developments in the masterplan that are to be used for:
 - (i) commercial, community, office or retail purposes; or
 - (ii) for any other purpose that is not related to airport services; and
- (gc) in relation to the initial period of the master plan—the likely effect of the proposed developments in the master plan on:
 - (i) employment levels at the airport; and
 - (ii) the local and regional economy and community, including an analysis of how the proposed developments fit within the planning schemes for commercial and retail development in the area that is adjacent to the airport; and
- (h) an environment strategy that details:
 - (i) the airport-lessee company's objectives for the environmental management of the airport; and
 - (ii) the areas (if any) within the airport site which the airport-lessee company, in consultation with State and Federal conservation bodies, identifies as environmentally significant; and
 - (iii) the sources of environmental impact associated with airport operations; and
 - (iv) the studies, reviews and monitoring to be carried out by the airport-lessee company in connection with the environmental impact associated with airport operations; and
 - (v) the time frames for completion of those studies and reviews and for reporting on that monitoring; and
 - (vi) the specific measures to be carried out by the airport lessee company for the purposes of preventing, controlling or reducing the environmental impact associated with airport operations; and
 - (vii) the time frames for completion of those specific measures; and

- (viii) details of the consultations undertaken in preparing the strategy (including the outcome of the consultations); and
- (ix) any other matters that are prescribed in the regulations; and
- (j) such other matters (if any) as are specified in the regulations.

In accordance with these requirements, Jandakot Airport's first master plan, Master Plan 2005, was approved by the then Minister for Transport and Regional Services on 3 January 2006. The second master plan, Master Plan 2009, was approved by the then Minister for Infrastructure, Transport, Regional Development and Local Government on 9 March 2010. The Jandakot Airport Environment Strategy 2009 was also approved by the Minister on 9 March 2010. As a result of amendments to the *Airports Act 1996* in 2012, the Environment Strategy is required to form part of the master plan. The third master plan, and the first incorporating the Environment Strategy, Master Plan 2014, was approved by the then Minister for Infrastructure and Regional Development on 17 February 2015. This Master Plan 2020 was approved by the Minister for Infrastructure, Transport and Regional Development on 22 August 2021.

A complete table of the requirements of the *Airports Act 1996* and associated key regulations, and the references within the Master Plan is contained in Appendix A.

MAJOR DEVELOPMENT PLAN

Some of the development activities planned for in a master plan may require further consultation and approval. Section 88 of the *Airports Act 1996* requires a major development plan (MDP) for designated major airport developments which are then subject to further community consultation, environmental assessment and Ministerial approval. Section 91 of the Act requires an MDP to be consistent with the final master plan for the airport. The major airport developments subject to a MDP include:

- Constructing a new runway, extending the length of a runway, or altering a runway in any way that significantly changes flight paths or the patterns or levels of aircraft noise;
- Constructing a new building wholly or principally for use as a passenger terminal, where the building's gross floor space is greater than 500 square metres;

- Extending a building that is wholly or principally for use as a passenger terminal, where the extension increases the building's gross floor space by more than 10%;
- Constructing a new building, where the building is not wholly or principally for use as a passenger terminal and the cost of construction exceeds \$25 million;
- Constructing a new taxiway or extending a taxiway, where the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft and the cost of construction exceeds \$25 million;
- Constructing a new road or new vehicular access facility, or extending a road or vehicular access facility, where the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft, and the cost of construction exceeds \$25 million; and
- A development of a kind that is likely to have significant environmental or ecological impact; or a development which affects an area identified as environmentally significant in the environment strategy.

The following MDPs have been approved since, or were approved shortly prior to, the approval of the Master Plan 2014:

- ALDI Distribution Centre, located within Precinct 4; approved by the Minister for Infrastructure and Regional Development on 12 August 2014;
- K Mart Distribution Centre, located within Precinct 5; approved by the Minister for Infrastructure and Regional Development on 12 January 2015;
- Extension of Runway 12/30 and Taxiway System, located within Precinct 3; approved by the Minister for Infrastructure and Transport on 15 June 2016; and
- Western Power Depot, located within Precinct 6; approved by the Minister for Infrastructure and Transport on 2 March 2018. This Major Development Plan was subsequently withdrawn.

2.2.2 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the key environmental legislation of the Commonwealth Government that provides a framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, defined in the EPBC Act as matters of national environmental significance.

In addition, the EPBC Act confers jurisdiction over actions that have the potential to have a significant impact on the environment where the actions affect, or are taken on, Commonwealth land or are carried out by a Commonwealth agency.

EPBC referral 2009/4796 (Jandakot Airport Expansion, Commercial Development and Clearance of Native Vegetation, WA) was approved with conditions by the then Minister for Environment, Water, Heritage and Arts in March 2010. This approval allowed for clearing of native vegetation within Precincts 1B, 3, 4 and 5 to enable commercial development and the proposed airfield development as detailed in Master Plan 2009 and Master Plan 2014. The conditions of approval included conserving in perpetuity the remaining vegetation in Precincts 1A, 1B, 2A and 2B, and the development and implementation of various management plans, including an Offset Plan, Conservation Management Plan, Construction Environmental Management Plan and Groundwater Management Plan. All of these plans have been developed and implemented (refer to Chapter 9). The majority of the proposed actions associated with this EPBC referral have been completed, with the remaining actions scheduled to be undertaken as part of the implementation of Master Plan 2020. Annual compliance reports, addressing the conditions of approval, and the implementation of associated management plans, are required to be submitted to the Department of Agriculture, Water and the Environment and the Department of Infrastructure, Transport, Regional Development and Communications.

EPBC Referral 2013/7032 (Jandakot Airport Precinct 6 and 6A) was approved by the then Department of the Environment in July 2014. This approval allowed for the clearing of native vegetation within Precincts 6 and 6A for mixed business and aviation developments. The conditions of approval included the acquisition of offset land, the development and implementation of a Construction Environmental Management Plan, and measures to protect the Jandakot Groundwater Mound.

The proposed actions associated with this EPBC referral have been completed and all conditions have been satisfied.

2.2.3 AVIATION TRANSPORT SECURITY ACT 2004

Jandakot Airport was a category 6 security controlled airport under the *Aviation Transport Security Act 2004* and *Aviation Transport Security Regulations 2005*. This requirement was revoked in October 2020 and Jandakot Airport is no longer a security controlled airport.

2.2.4 NATIONAL AIRPORTS SAFEGUARDING FRAMEWORK

The National Airports Safeguarding Advisory Group was established to prepare a National Airports Safeguarding Framework (NASF). The NASF is a national land use planning framework that aims to:

- Improve community amenity by minimising aircraft noise-sensitive developments near airports including through the use of additional noise metrics and improved noise-disclosure mechanisms; and
- Improve safety outcomes by ensuring aviation safety requirements are recognised in land use planning decisions through guidelines being adopted by jurisdictions on various safety-related issues.

The national land use planning framework will ensure future airport operations and their economic viability are not constrained by incompatible residential development and activities.

The draft NASF was released for public comment in March 2012 and endorsed by Commonwealth, State and Territory Ministers at the Standing Council on Transport and Infrastructure meeting in May 2012.

JAH supports the measures to improve the long-term safety and viability of Jandakot Airport and has considered the NASF guidelines in Chapter 8.

2.3 STATE GOVERNMENT PLANNING FRAMEWORK

The State Government recognises Jandakot Airport as a vital piece of infrastructure and has identified the airport as a 'specialised activity centre', as outlined in Section 2.3.3. As the land on which the airport is located is owned by the Commonwealth Government and the airport is subject to Commonwealth legislation, State planning laws do not apply to the airport site.

However, the Act and subsidiary regulations require that a master plan, where possible, describe proposals for land use planning and zoning in a format consistent with that used by the State or Territory in which the airport is located.

Where possible, this Master Plan has considered State planning requirements and has incorporated zoning and land use descriptions derived from the surrounding local government planning frameworks.

The developments anticipated at Jandakot Airport will complement the existing and future land uses in the surrounding locality and are considered to be consistent with the respective local government land use zones. This future development will be entirely consistent with the activity centre and employment generation objectives of the State Government as identified in the planning framework.

State Government planning is controlled by the Western Australian Planning Commission, which, with the professional and technical support of the Department of Planning, Lands and Heritage, administers the Metropolitan Region Scheme and publishes policies on a wide range of planning matters.

2.3.1 STATE AVIATION STRATEGY (2015)

A draft State Aviation Strategy was prepared by the WA Department of Transport and released for public comment in September 2013. The final State Aviation Strategy was published in February 2015. The State Aviation Strategy is the first developed for Western Australia and is aimed at supporting the economic and social development of WA through the provision of safe, affordable, efficient and effective aviation services and infrastructure. It seeks to respond to current opportunities in the State's aviation infrastructure, airport governance and levels of aviation service competition.

The Strategy proposes a suite of actions whereby the State will work in partnership with airports, regional shire councils, airlines and the resources and energy sector to ensure adequate services continue to meet demand. The Strategy is designed to provide a sound framework for policy setting, and future planning and investment in Western Australian international and domestic air services and airport infrastructure.

The Strategy acknowledges that *"For several decades, successive WA governments have encouraged the development of aviation training facilities in WA. The objective has been to attract international pilot and other aviation skills training to provide increased economic opportunities for WA's aviation industry and infrastructure."*

A finding of the Strategy is that *"There are opportunities to improve and develop aviation training in WA, building on the State's strong track record and its inherent advantages of clear skies and good flying weather."*

Jandakot Airport has been the largest pilot training airfield in Australia since opening in 1963. With the development included in this Master Plan, the airport will continue to play a significant role in maintaining, encouraging and enhancing pilot training activities.

2.3.2 STATE PLANNING STRATEGY 2050

The State Planning Strategy 2050 is the lead strategic planning document of the State Government. The Strategy provides the strategic guide for land use planning through to the year 2050 and provides a vision and a set of principles by which coordinated, sustainable development will be implemented. The strategy does not provide a specific land use plan for the Perth metropolitan area, but identifies as a principle the need to provide efficient transport routes and hubs. Specifically, the draft strategy seeks to protect land for key transport hubs where air, road and rail transport is integrated and identifies Jandakot Airport as an airport in the Perth region.

2.3.3 DIRECTIONS 2031 AND BEYOND – METROPOLITAN PLANNING BEYOND THE HORIZON

Directions 2031 and Beyond – Metropolitan Planning Beyond the Horizon (Directions 2031) is the State's high level strategic plan that establishes a spatial framework and vision for the future growth of the Perth and Peel regions.

Directions 2031 predicts a population increase of more than half a million people over the next 20 years, growing to a city of 3.5 million people after 2050. The plan identifies Jandakot Airport as a 'specialised activity centre', which provides an important and high level logistical function in the metropolitan region. Directions 2031 identifies that specialised centres have features in common with other activity centres and which complement, rather than compete, with other activity centres.

The continual development of the airport as envisaged under this Master Plan is consistent with, and represents the implementation of, the specialised activity centre status of Jandakot Airport as designated by Directions 2031.

2.3.4 PERTH AND PEEL @ 3.5 MILLION

Since the release of the Directions 2031 strategic plan in 2010, the State Government has built on the key principles and vision of this document in publishing the Perth and Perth @ 3.5 Million suite of land use planning and infrastructure frameworks. The intent of the Central, North-West, North-East and South Metropolitan Peel frameworks is to guide the future growth of the Perth and Peel regions as a compact, consolidated and connected city that can accommodate a population of 3.5 million by 2050.

Jandakot Airport is located within the South Metropolitan Peel Sub-Regional Planning Framework (Framework) which identifies the airport as a 'specialised activity centre', that has the potential to provide regionally-significant economic and institutional activities that attract substantial numbers of people, particularly focused on aviation and logistic services. The Framework also recognises the specialised education and training facilities available at the airport.

The continual development of the airport as envisaged under this Master Plan is consistent with, and represents the implementation of, the specialised activity centre status of Jandakot Airport as designated by Perth and Perth @ 3.5 Million and the associated South Metropolitan Peel Sub-Regional Planning Framework.

2.3.5 STATE PLANNING POLICY 4.2 – ACTIVITY CENTRES FOR PERTH AND PEEL

Published in 2010, and developed in conjunction with Directions 2031, State Planning Policy 4.2 – Activity Centres for Perth and Peel (SPP 4.2) identifies Jandakot Airport as a 'Specialised Centre' with a primary aviation and logistic services function.

The policy acknowledges that as Jandakot Airport is subject to Commonwealth legislation, it is outside of the realm of the policy provisions which address activity centre planning requirements. With respect to the 'Specialised Centre' designation, the policy notes that:

"Specialised centres provide opportunities for the development of complementary activities, particularly knowledge-based businesses. A range of land uses that complement the primary function of these centres will be encouraged on a scale that will not detract from other centres in the hierarchy."

The continual development of the airport as envisaged under this Master Plan will enable aviation and logistics related businesses to locate at the airport, taking advantage of the available developable land whilst not detracting from other centres.

2.3.6 STATE PLANNING POLICY 5.3 – LAND USE PLANNING IN THE VICINITY OF JANDAKOT AIRPORT

The State Government recognises Jandakot Airport as a vital piece of infrastructure in terms of the aviation facilities it provides, as well it being a strategic employment hub. As a result, the Western Australian Planning Commission (WAPC) has prepared State Planning Policy 5.3 – Land Use Planning in the Vicinity of Jandakot Airport in January 2017 (SPP 5.3), replacing the previous SPP 5.3, titled Jandakot Airport Vicinity, that was prepared in March 2006.

The objectives of SPP 5.3 are to:

- Protect Jandakot Airport from encroachment by incompatible land use and development, so as to provide for its ongoing, safe, and efficient operation; and
- Minimise the impact of airport operations on existing and future communities with particular reference to aircraft noise.

The policy seeks to control the zoning, development and subdivision of land outside of Jandakot Airport to protect both the operations of the airport and noise impacts for surrounding residents.

The previous version of SPP 5.3 (March 2006) included the Australian Noise Exposure Forecast (ANEF) 2025 contours from the Jandakot Airport Master Plan 2005, which included the proposed fourth runway. The current SPP 5.3 (January 2017) takes a different approach, in that the ANEF is referenced into the policy, via the ANEF prepared by Jandakot Airport, and endorsed for technical accuracy by Airservices Australia in accordance with the requirements of the *Airports Act 1996*.

This approach ensures that the current ANEF, as endorsed by Airservices Australia, applies via the policy.

2.3.7 STATE PLANNING POLICY 2.3 – JANDAKOT GROUNDWATER PROTECTION

State Planning Policy 2.3 – Jandakot Groundwater Protection (SPP 2.3) has been prepared by the WAPC to protect the Jandakot Groundwater Protection Area from development and land uses that may have a detrimental impact on the water resource.

2.3.8 STATE PLANNING POLICY 3.7 – PLANNING IN BUSHFIRE PRONE AREAS

State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7) has been prepared by the WAPC to appropriately recognise and plan for the risk associated with bushfire in those areas identified by the Department of Fire and Emergency Services (DFES) as being “bushfire prone”. Parts of Jandakot Airport are identified as bushfire prone, with DFES mapping updated annually to reflect changes in clearing, development, and the scientific evidence informing the level of bushfire risk. A working group involving State and Commonwealth Government agencies is presently undertaking a review of the State’s bushfire planning framework and it is anticipated that an updated map and proposed changes to SPP 3.7 will be released for public comment in 2021.

As individual developments are proposed, the bushfire risk can most appropriately be addressed as part of the further development approval requirements, as outlined at Section 11.1, for example through the requirement for a Bushfire Management Plan as part of a Major Development Plan or Application for Development Approval.

2.3.9 STATE PLANNING POLICY 2.8 - BUSHLAND POLICY FOR THE PERTH METROPOLITAN REGION

State Planning Policy 2.8 - Bushland Policy for the Perth Metropolitan Region (SPP 2.8) has been prepared by the WAPC to identify measures that will apply to proposals or decisions that are likely to have an adverse impact on regionally significant bushland within a ‘bush forever’ area. Bush forever is not binding on Commonwealth land and does not prevent any use or development at Jandakot Airport. Whilst one of the objectives of SPP 2.8 is to seek to protect regionally significant bushland, it recognises that the airport site can be developed in accordance with its purpose as an airport owned by the Commonwealth Government and subject to Commonwealth legislation.

2.3.10 METROPOLITAN REGION SCHEME

The Metropolitan Region Scheme (MRS) is prepared and administered by the Western Australian Planning Commission as the principal planning scheme for the Perth metropolitan region. The MRS provides broad scale land use zones and sets out regional reservations.

The whole of the Jandakot Airport estate is reserved for ‘Public Purposes: Commonwealth Government’ under the MRS, along with the whole of the estate being identified as ‘Bush Forever Area’ notice of delegation area (which does not affect the ‘Public Purposes: Commonwealth Government’ reserve). The western and southern extent of Jandakot Airport is also identified as a ‘Water Catchments’ reserve overlay (which does not affect the ‘Public Purposes: Commonwealth Government’ reserve), consistent with the alignment of the Jandakot Groundwater Protection area, as identified in SPP 2.3.

The MRS does not place any limitations on permissible uses in the designated reservations. That is, under the provisions of the MRS, any use can be approved on any reserved land. The ‘Public Purposes: Commonwealth Government’ and ‘Water Catchments’ reservations, and ‘Bush Forever Area’ identification do not prevent the approval of any use or development on the Jandakot Airport site.

Current land use zoning and reservations in the area surrounding Jandakot Airport, as depicted in the Metropolitan Region Scheme, include:

- Public Purposes – Special Uses;
- Other Regional Roads;
- Railways;
- Urban;
- Rural;
- Parks & Recreation;
- Industrial; and
- Rural – Water Protection.

The Jandakot Airport estate in the context of the MRS is shown in Figure 2.1.

2.4 LOCAL GOVERNMENT PLANNING FRAMEWORK

2.4.1 CITY OF COCKBURN LOCAL PLANNING SCHEME NO. 3

The Jandakot Airport estate lies wholly within the boundary of the City of Cockburn. Part of the northern boundary of the estate (Leeming Road and Ken Hurst Park) abuts the southern boundary of the City of Melville, and the western boundary of the City of Canning abuts the north east airport boundary.

The majority of the City of Cockburn local government area is predominantly zoned for residential development, with significant industrial zones and areas reserved for regionally significant open space.

The continual development of the airport as envisaged under this Master Plan is consistent with the aims of the Local Planning Scheme, which seeks to ensure that the development and use of land is appropriate with regard to public amenity, convenience, quality of life, and compatible land uses. This is established by the City of Cockburn's Local Commercial and Activities Centres Strategy outlined below, which identifies Jandakot Airport as a strategic employment centre with a high density of jobs in a single location, where more of the future businesses and jobs are forecast to be located.

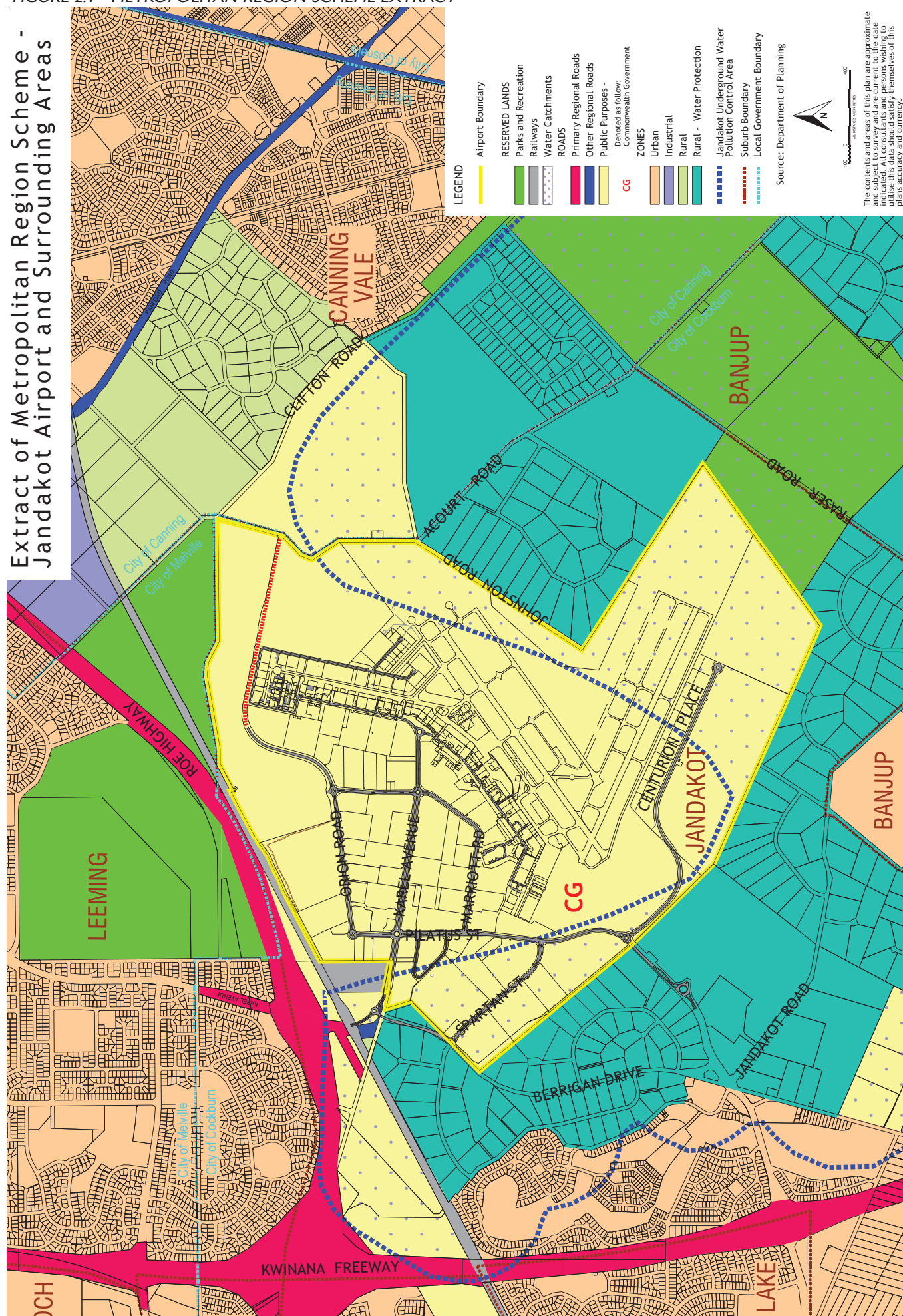
The ongoing aviation use and development of Jandakot Airport is also consistent with the Local Planning Scheme, in that land surrounding the airport has been zoned 'Resource' so as to prevent more intensive residential development which may be sensitive to aircraft noise.

2.4.2 CITY OF COCKBURN LOCAL COMMERCIAL AND ACTIVITIES CENTRES STRATEGY (2012)

In December 2012 the Council of the City of Cockburn adopted the Local Commercial and Activities Centres Strategy for the local government area. This strategy was prepared in the context of the WAPC's Directions 2031 and SPP 4.2 documents and represents the strategic guide for the planning and development of activity centres within the City of Cockburn. With respect to Jandakot Airport the strategy identifies that the estate provides a strategic employment centre with a high density of jobs in a single location. The strategy notes that the airport (along with other strategic employment centres) is forecast to contain more of the future businesses and jobs within the City of Cockburn.

Consistent with the WAPC documents identified above, the strategy identifies the airport as a specialised activity centre, and notes that as it is subject to Commonwealth legislation, State planning laws do not apply.

FIGURE 2.1 - METROPOLITAN REGION SCHEME EXTRACT



3. JANDAKOT AIRPORT LAND USE

JAH is committed to maintaining and upgrading infrastructure for the airport to operate safely, efficiently and effectively. The cost of the aviation infrastructure development and maintenance is not sustainable without income from diversified commercial activities.

The *Airports Act 1996* provides for the efficient economic development of the airport site and development for additional uses.

3.1 JANDAKOT AIRPORT LEASE

On 1 July 1998 the Commonwealth Government sold a 50 year lease over Jandakot Airport, with an option of a 49 year lease extension, to Jandakot Airport Holdings Pty Ltd.

An essential term of the lease is that the lessee must comply with all legislation relating to the airport site, including the *Airports Act 1996*. Whilst the Act requires that JAH operate the airport site as an airport, it also provides for the efficient economic development of the site and for its development for additional uses. The non-aviation development of the airport estate is crucial for the economic viability of Jandakot Airport.

3.2 INTERESTS ON AIRPORT LAND

There are a number of existing interests registered on the Certificates of Title for Jandakot Airport which pre-date the lease of the airport site to Jandakot Airport Holdings. These are identified in Appendix B, in accordance with Section 71(5) of the *Airports Act 1996* and Regulation 5.02(3) of the *Airports Regulations 1997*.

3.3 MASTER PLAN 2020

This Master Plan 2020 provides for the development of the airport, taking into account aviation operations, the environment, non-aviation land use, services infrastructure and ground transport. In accordance with the Act, this Master Plan relates to a planning period of 20 years with the Master Plan to be replaced every eight years. This Master Plan replaces the existing Master Plan 2014 and fulfils JAH's statutory obligations under the *Airports Act 1996*.

This Master Plan retains the precincts as shown in the existing Master Plan 2014.

The precincts of the airport site are shown on Figure 3.1.

The land use precincts and discretionary land uses for each of the Precincts are outlined in Sections 3.5.3 and 3.5.4.

3.4 JANDAKOT AIRPORT LAND USES

- Conservation – 119 hectares (19%);
- Aviation Operations (includes runways and taxiways) – 257 hectares (42%);
- Non-Aviation Development – 201 hectares (32%); and
- Existing and Proposed Internal Roads and Services Area – 45 hectares (7%).

3.5 LAND USE PRECINCTS

Figure 3.1 identifies the Master Plan 2020 land uses precincts for the estate, which are as follows:

- Precinct 1A (48ha) – Conservation.
- Precinct 1B (31ha) – Conservation.
- Precinct 2A (29ha) – Conservation.
- Precinct 2B (11ha) – Conservation.
- Precinct 3 (247 ha) – Aviation Operations.
- Precinct 4 (120 ha) – Mixed Business.
- Precinct 5 (41 ha) – Mixed Business.
- Precinct 6 (40 ha) – Mixed Business.
- Precinct 6A (10 ha) – Aviation Operations.

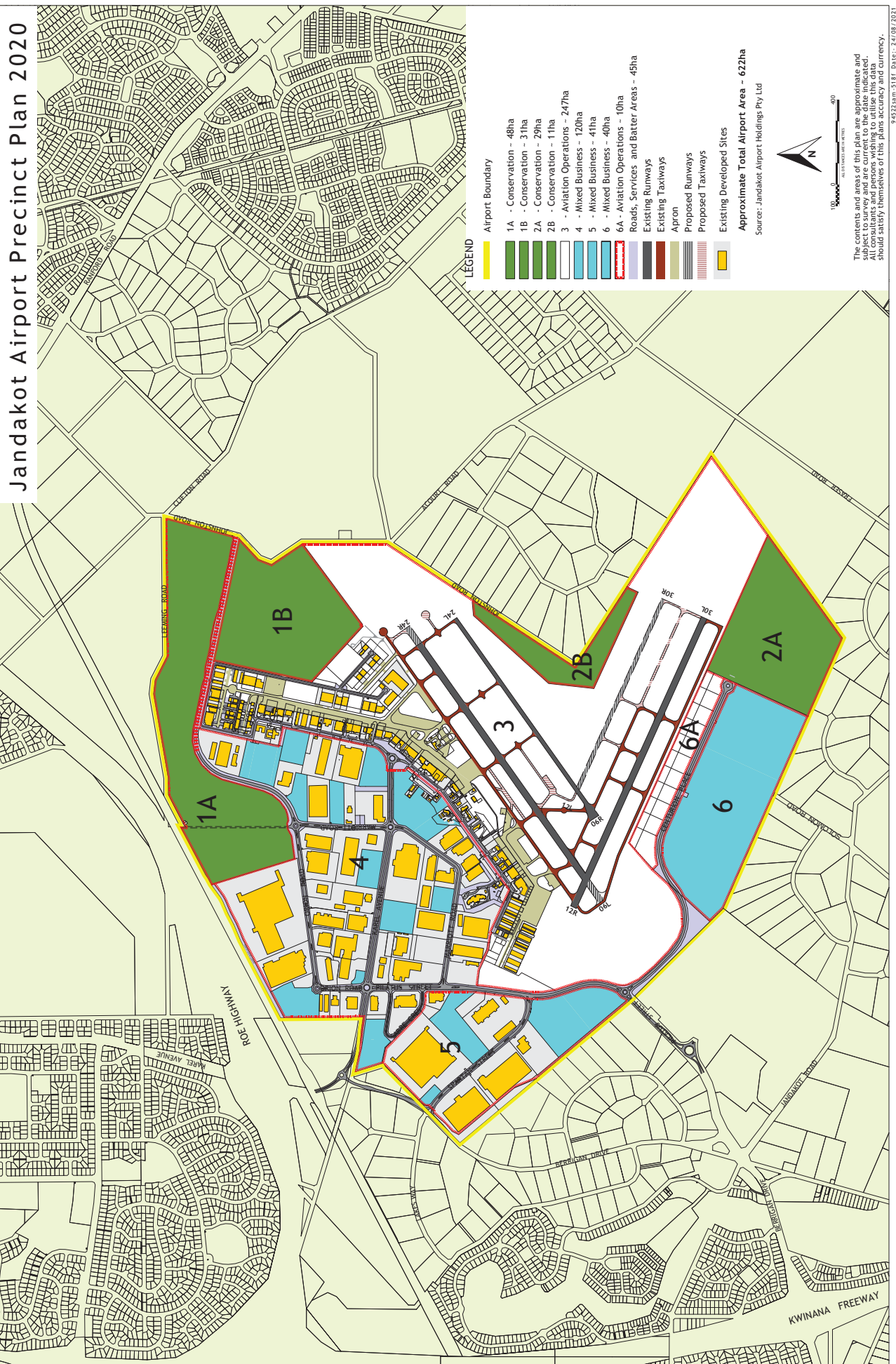
The remainder of the 622ha site is allocated to existing and proposed roads and service areas.

3.5.1 CHANGES IN LAND USE FROM THE MASTER PLAN 2014

Regulation 5.02 of the *Airports Regulations 1997* requires that a master plan must specify an area of the airport where a change of use is proposed of a kind described in sub-regulation 6.07(2) of the *Airports (Environment Protection) Regulations 1997*.

The boundary between Precinct 4 and Precinct 3 has been marginally amended to exclude the site of the former China Southern Accommodation Facility from Precinct 3.

FIGURE 3.1 - JANDAKOT AIRPORT PRECINCT PLAN



3.5.2 CONSERVATION (PRECINCTS 1A, 1B, 2A AND 2B)

Precincts 1A, 1B, 2A and 2B are identified 'Conservation', with these areas to be retained as bushland.

3.5.3 AVIATION OPERATIONS (PRECINCTS 3 AND 6A)

Precinct 3 and 6A are set aside for Aviation operations which comprises the runway, taxiways, aprons, helicopter landing sites and all associated infrastructure required for the current and future movement of aircraft. This Precinct also includes navigation aids, aviation fuel storage, aircraft maintenance facilities, aircraft hangars, and administration offices associated with the operations of aviation related tenants.

The airport has some land reserves available to cater for the near future expansion of aviation facilities.

3.5.4 NON-AVIATION (MIXED BUSINESS) DEVELOPMENT (PRECINCTS 4, 5 AND 6)

Precincts 4, 5, and 6 are identified as 'Mixed Business' land use areas for non-aviation development. This land use area is based on the 'Mixed Business' zone, as contained in the City of Cockburn Town Planning Scheme No. 3.

PRECINCT 4

The objective of Precinct 4 is to provide a mixed use business park-like setting supporting a landscaped entrance to the airport, taking advantage of this entrance location by supporting high activity generating uses. The Precinct has been developed for, and will continue to support warehouse, manufacturing, storage, office, business and professional services and existing retail type development land uses.

PRECINCT 5

The objective of Precinct 5 is to provide a mixed use business park-like setting and to provide uses appropriate for the Jandakot Underground Water Protection Control Area (JUWPCA) outlined in Section 9.2.1. The Precinct has been developed for, and will continue to support warehouse, manufacturing and storage type development and land uses that will be generally consistent with the City of Cockburn's 'Mixed Business' zone and will be controlled to prevent impacts to the Jandakot Water Mound. In this regard no bulk chemical storage operations are to be located within the portions of the Precinct within the JUWPCA.

PRECINCT 6

The objective of Precincts 6 is to provide a mixed use business park-like setting and to provide uses appropriate for the JUWPCA (for the eastern half of Precinct 6). Precinct 6 will support warehouse, manufacturing and storage type development and land uses that will be generally consistent with the City of Cockburn's 'Mixed Business' zone and will be controlled to prevent impacts to the Jandakot Water Mound. In this regard no bulk chemical storage operations are to be located within the portions of the Precincts within the JUWPCA.

Discretionary land uses within Precincts 4, 5, and 6 are identified in Table 3.1.

Table 3.1 Precincts 4, 5, and 6 – Discretionary Land Uses

Animal Establishment	Amusement Parlour
Bank	Betting Agency
Club Premises	Commercial Vehicle Parking
Farm Supply Centre	Fast Food Outlet
Garden Centre	Hardware Store
Hotel/Tavern	Industry – Cottage
Industry – Light	Industry – Service
Market	Motor Vehicle, Boat or Caravan Sales
Motor Vehicle Hire Premises	Motor Vehicle Wash
Motor Vehicle Repair	Lunch Bar
Nursery	Office
Service Station	Public Amusement
Reception Centre	Recreation – Private Private
Restaurant	Showroom
Storage Yard	Vehicle – Disused
Veterinary Centre	Warehouse

3.6 CONSISTENCY WITH STATE AND LOCAL PLANNING FRAMEWORK

Regulation 5.02(2) of the *Airports Regulations 1997* states that "an airport master plan must, in relation to the landside part of the airport, where possible describe proposals for land use and related planning, zoning or developments in an amount of detail equivalent to that required by, and using terminology (including definitions) consistent with that applying in, land use planning zoning and development legislation in force in the State or Territory in which the airport is located."

Whilst the terminology of land use 'precincts' has been used in this Master Plan, consistent with the two previous master plans for Jandakot Airport, these precincts effectively operate as, and are consistent with, land use 'zones', being the terminology used in the State and Local Government planning framework. To demonstrate this, and as stated in Section 3.5.4, the 'Mixed Business' Precincts have been based on the 'Mixed Business' zone as contained in the City of Cockburn Town Planning Scheme No. 3. In this regard, the land uses that may be developed on Jandakot Airport within the Mixed Business Precincts 4, 5, and 6, as identified in Table 3.2, are consistent with the range of land uses that may potentially be approved for development by the City of Cockburn within the 'Mixed Business' zone under Town Planning Scheme No. 3.

In this regard, where possible the Jandakot Airport land use plan as contained in this Master Plan has been developed in an amount of detail and using terminology and definitions consistent with that of the Western Australian Planning Commission Model Provisions, as contained in the *Planning and Development (Local Planning Schemes) Regulations 2015*, and is also consistent as far as practicable with the local planning scheme of the City of Cockburn.

The Cities of Cockburn, Canning and Melville have been involved in the preliminary consultation at the initiation of the master plan review process. Consultation with the City of Cockburn regarding the envisaged development and land uses for the airport estate, has been ongoing during the preparation of this Master Plan 2020.

3.7 SENSITIVE DEVELOPMENTS

Section 71A of the Act requires a master plan to identify any proposed 'sensitive developments', defined as development, or redevelopment that increases the capacity, of the following:

- Residential dwelling;
- Community care facility;
- Pre-school;
- Primary, secondary, tertiary or other education institution; and
- Hospital.

Sensitive developments are prohibited on Commonwealth leased airports apart from in exceptional circumstances, and require an airport to

apply to the Minister for Infrastructure and Transport for approval to prepare a draft major development plan for the proposed development. The Minister may approve the preparation of the draft major development plan only if he or she is satisfied that there are exceptional circumstances that support its preparation.

There are no specific proposals for sensitive developments in this Master Plan 2020.

4. AVIATION DEVELOPMENT

4.1 AIRCRAFT MOVEMENTS

4.1.1 NATIONAL TRENDS

Many of the cost pressures that have negatively affected general aviation activity in Australia over the past five years continue to impact the industry, most notably the price of aviation fuel and more recently Covid 19. It is uncertain whether training bases such as Jandakot Airport stand to benefit from an upsurge in flying training activities in the next eight years as previously anticipated. Although flying training numbers are steady at this time there may be a temporary future drop off of training activity due to the difficulties of international students being granted access into Australia during the Covid19 pandemic. Flying training and charters continue to make up the largest categories in the general aviation sector, whilst other categories such as private and aerial work remain relatively flat. Helicopter activity will continue to grow, as evidenced by the increasing proportion of helicopters within the overall Australian general aviation fleet mix.

Figure 4.1 shows the number of aircraft movements at Jandakot Airport compared with the other major general aviation airports in Australia over the last 10 years.

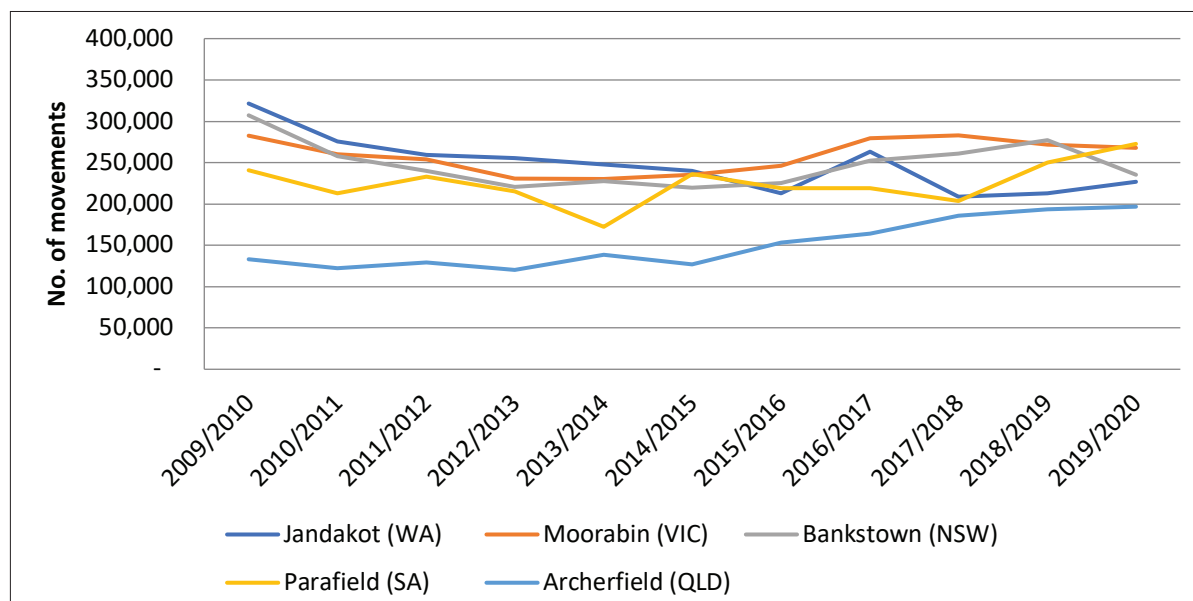
4.1.2 JANDAKOT AIRPORT

Jandakot Airport operates 24 hours, 7 days a week. The airport has a significant role as a major training base for both local and international pilots. Flying training activities account for approximately 80% of the annual movements conducted at the airport, with some 60% of movements being repetitive 'touch-and-go' circuit operations.

Pilot training is provided by two major flying schools at Jandakot Airport – Singapore Flying College, and the Royal Aero Club of Western Australia. Other training organisations include Airflite, Air Australia International, Minovation, Cloud Dancer, Jandakot Flight Centre, Major Blue Air, Pacific Flight Services and the University Flying Club. Heliwest and Corsaire are the largest providers of helicopter training.

Charter and aerial work operations related to agriculture, mining, tourism related activities and rural services have been estimated to contribute about 16% of the total aircraft movements at Jandakot Airport. Flights related to mining are mainly ad-hoc charters that fly out to remote areas not covered by major airline routes or 'fly-in fly-out' operators. Aerial work services include air ambulance (e.g. Royal Flying Doctor Service and Formula Aviation), bushfire surveillance and water

FIGURE 4.1 - GENERAL AVIATION AIRPORTS MOVEMENT COMPARISON



bombing, media, aerial spraying and surveying. Other operations relate to private flying and general helicopter operations.

Figure 4.2 shows the total aviation movements recorded by Airservices Australia for the last 10 years for Jandakot Airport.

Airservices Australia data summarises movements of helicopter, military, fixed wing under 7 tonne maximum take-off weight and fixed wing above 7 tonnes. These are shown in Table 4.1 for the past five years.

FIGURE 4.2 - JANDAKOT AIRPORT TOTAL ANNUAL AIRCRAFT MOVEMENTS

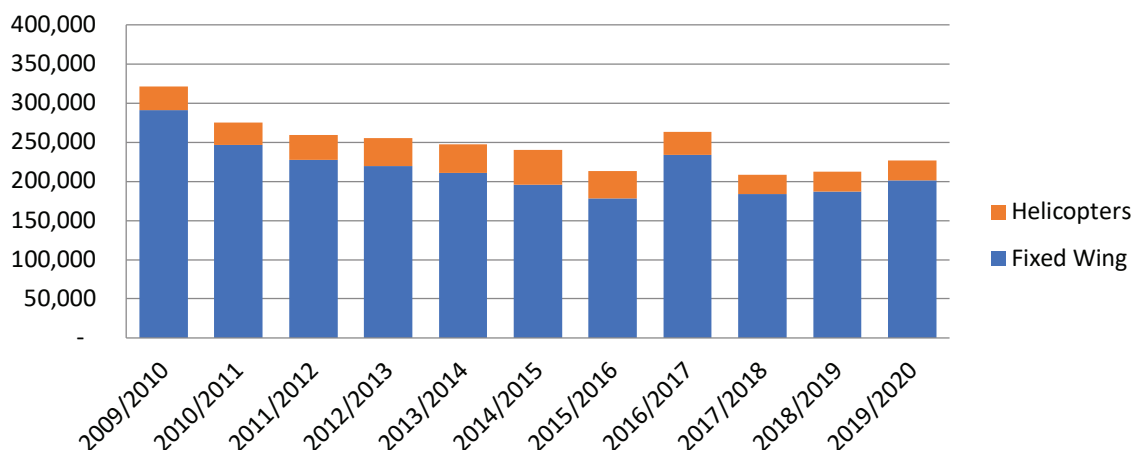


Table 4.1 Jandakot Airport Aircraft Movements

Aircraft Weight/Type	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2019/2020 %
Between 7-136 tonnes	1,466	580	778	1,428	2,398	1.06
Under 7 tonnes	176,422	230,012	181,576	185,306	198,214	87.6
Helicopter	35,092	29,698	24,664	25,586	25,636	11.33
Military	80	56	66	36	16	0.007
Total	213,060	260,346	207,084	212,356	226,264	

Source: Airservices Australia

4.2 MOVEMENT CAPACITY

Identifying overall future aircraft movement capacity is important for planning purposes.

When endorsing the Australian Noise Exposure Forecast (Refer to Chapter 8), Airservices Australia needs to be satisfied that the forecast numbers of aircraft movements, operating times and the aircraft types carrying out operations are not greater than the physical ultimate capacity of the existing or proposed runways at the airport.

Jandakot Airport movement capacity was assessed in Master Plan 2014 showing the airport's maximum theoretical operating capacity as 460,000 fixed-wing movements and 66,000 helicopter movements per annum. This has been reviewed and the movement capacity remains the same.

It should be noted that any future changes to airspace or operational procedures, such as circuit area restrictions or other aircraft separation requirements, will impact the movement capacity of the airport.

4.3 MOVEMENT FORECASTS

Future demand for pilot training is extremely difficult to predict. Student intake is largely driven by the forecast demand for pilots by the airline industry.

Private general aviation operators are vulnerable to cost, administrative impacts and more recently the impact of Covid 19. Increasing operating costs and additional regulatory controls are cited as the major reasons for private operators reducing their flying hours.

Air traffic movements at Jandakot Airport reached a peak of 415,284 annual movements in 2005/2006, and declined significantly after the Global Financial Crisis. While the past ten years have seen very little movement growth and local training schools previously indicated that the demand for pilot training was expected to increase in 2015/2016, this did not eventuate. China Southern Flying College Western Australia (CSFCWA) was grounded by CASA for the majority of 2018 which accounted for the overall decrease in movements at the airport for the financial year 2017/2018. The training schools were confident of continued growth over the next eight years. This view is supported by the addition of three new flying schools commencing operations at Jandakot Airport in the latter half of 2018, the resumption of operations at CSFCWA and the commencement of a large flying school in 2020 (Pacific Flight Services). All of these flying schools have been impacted by Covid 19. CSFCWA no longer operates at Jandakot Airport.

There are currently 700 students undertaking fixed-wing pilot training at Jandakot Airport, resulting in approximately 70,000 flying hours per annum. The training schools have estimated that over the next 5-10 years student numbers will increase by 40% and their flying hours will reach 126,000 hours per annum.

At an average projected growth rate of 4.0% per annum for fixed-wing movements and 3.4% average growth rate for helicopter movements, the theoretical operating capacity of 460,000 fixed wing and 66,000 helicopter movements identified in this Master Plan could be reached within the 20 year planning horizon. While the assumed average growth rate of 4% is higher than growth rates forecast at similar general aviation airports, the expected student pilot intake, and aircraft fleet changes have been taken into consideration and it is likely that this growth could be achieved.

4.4 FLEET MIX

Due to runway and taxiway pavement characteristics, aircraft operating regularly at Jandakot Airport are restricted to types with a maximum take-off weight less than 5,700kg.

Fixed-wing aircraft currently account for 87% of all movements at Jandakot. Over 60% of all fixed-wing traffic is attributed to three of the most popular aircraft types used for pilot training at Jandakot Airport – the Cessna 172 (35% of all fixed-wing movements), Cessna

152 (16% of all fixed-wing movements), and Grob 115 (10% of all fixed-wing movements). Fixed-wing movements have declined substantially from 390,940 in 2005/2006 to 184,100 in 2017/2018 primarily due to a downturn in commercial and private pilot training demand following the Global Financial Crisis as well as the suspension of CSFCWA operations.

A number of flying schools have indicated that aircraft fleets will be upgraded within the next 5-10 years. The majority of the upgrades are replacing older aircraft with a similar aircraft type, so the type of aircraft currently used at the airport is not expected to change. The Royal Flying Doctor Service continues to operate mainly Pilatus PC-12 aircraft and added two PC-24's in 2019. PC-12s are also used by Police Air Wing and private charter companies. Formula Aviation is operating two Lear Jets for medical mercy flights to Indonesia and far reaches of Australia.

Helicopter activity showed a substantial increase between 2005 and 2014 and this rate of increase appears to be slowing. Helicopter circuit training operations represent over 50% of all rotary-wing movements. Nearly 53% of all helicopter activity is conducted by Robinson R22 types (2 seater single engine), with a further 23% attributed to the larger

Robinson R44 (4 seater single engine). The high percentage of R22 activity is due to the small helicopters being favoured for pilot training, with circuits accounting for 80% of all R22 activity.

Helicopters are also increasingly being used for emergency services response and support activities. Helicopters are preferred over fixed-wing aircraft due to the immediate deployment capability, manoeuvring flexibility and ability to be stationary for observation and reporting of events. This includes the Department of Fire and Emergency Services and Department of Biodiversity, Conservation and Attractions bushfire season surveillance and incident support operations, Police Air Wing surveillance and incident response, RAC Rescue helicopter medical and emergency response and seasonal activities such as aerial spraying and summer shark patrols. These operations are generally conducted in the larger helicopter types, such as the Bell 206 JetRangers, Eurocopter AS-350, Eurocopter AS-365, BK-117, Bell 214 and Bell 412. Each of these helicopter types make an average of 5 or less daily movements.

4.5 AVIATION DEVELOPMENT

Since approval of the Master Plan 2014, JAH has continued to develop aviation facilities at the airport. These works include:

- New apron for RFDS PC24 aircraft and new hardstand for fixed wing water bombers (completed in 2019);
- Extension of runway 12/30 by 500m and the construction of 2000m of associated new taxiways (completed in 2019);
- Construction of Centurion Road and services for new aviation development land in Precinct 6A (completed in 2019);
- Replacement of the entire airfield lighting system including new runway lights, taxiway lights and ATC interface (completed in 2019); and
- Continuation of the runway and taxiway resurfacing programme.

The current airfield layout is shown at Figure 4.3.

Of the 622 hectare land holding, 257 hectares (42%) has been identified in this Master Plan 2020 as being for aviation operations. JAH is committed to providing appropriate aviation infrastructure to accommodate future growth. The growth in aviation infrastructure will need to be undertaken in parallel with increased commercial activity to sustain the economic future of the airport. Without diversifying income to support aviation infrastructure the operating cost of aviation activities would need to increase significantly which would not be viable for the airport or its tenants.

Further aviation development to achieve the vision of a strategically significant aviation hub is proposed to include a fourth runway with associated taxiways and aviation support facilities as described below.

Airport development by 2040 is shown in Figure 4.4 Aviation Development Plan. Primary facilities shown in Figure 4.4 include:

- Extensions to runway 06L/24R;
- Proposed new runway 12L/30R;
- Proposed taxiways and aprons;
- Proposed non-directional beacon relocation;
- Potential future compass swing bay;
- Existing and proposed run-up bays; and
- Proposed aviation support facilities (eg wind indicators).

As detailed in Section 2.2.1, a major development plan is required to be prepared for the construction of a new runway and altering existing runways.

4.6 PLANNING STANDARDS

The International Civil Aviation Organization (ICAO) determines international standards and recommended practices for aviation operations. Australia also has its own regulatory requirements pertaining to the operation of aerodromes. These are based on the ICAO standards and recommended practices.

Australia's Civil Aviation Safety Authority (CASA) is responsible under Section 9(1)(c) of the *Civil Aviation Act 1988* for developing and promulgating appropriate clear and concise aviation safety standards through the Civil Aviation Safety Regulations 1998 Part 139. CASA prescribes the detailed technical requirements that are determined to be necessary for the safety of aerodromes and air navigation.

The Manual of Standards (MOS) Part 139 – Aerodromes sets out the standards to be adopted for Australian aerodromes. These standards are generally based on the standards and recommended practices set out in

ICAO Annex 14. Siting and operating standards for all airfield infrastructure at Jandakot Airport is determined in accordance with MOS Part 139.

ICAO has developed international standard Aerodrome Reference Codes for airport classifications which relate to particular aircraft groupings. These standard groupings are also adopted in MOS Part 139.

A critical aircraft of Code 2B is used as the basis for planning the layout of the primary runway 06L/24R, runway 12R/30L and associated taxiways at Jandakot Airport. A typical Code 2B aircraft in widespread use in Australia is the Fairchild Metro II, which is a twin engine turbo-prop aircraft with a passenger carrying capacity of up to 19. The bulk of Jandakot fixed wing traffic is made up of light single engine types such as Cessna 172 and Piper PA28 series aircraft which are Code 1A types. Code 1A aircraft types are adopted for planning the secondary runways 06R/24L and 12L/30R.

Current Airfield Layout

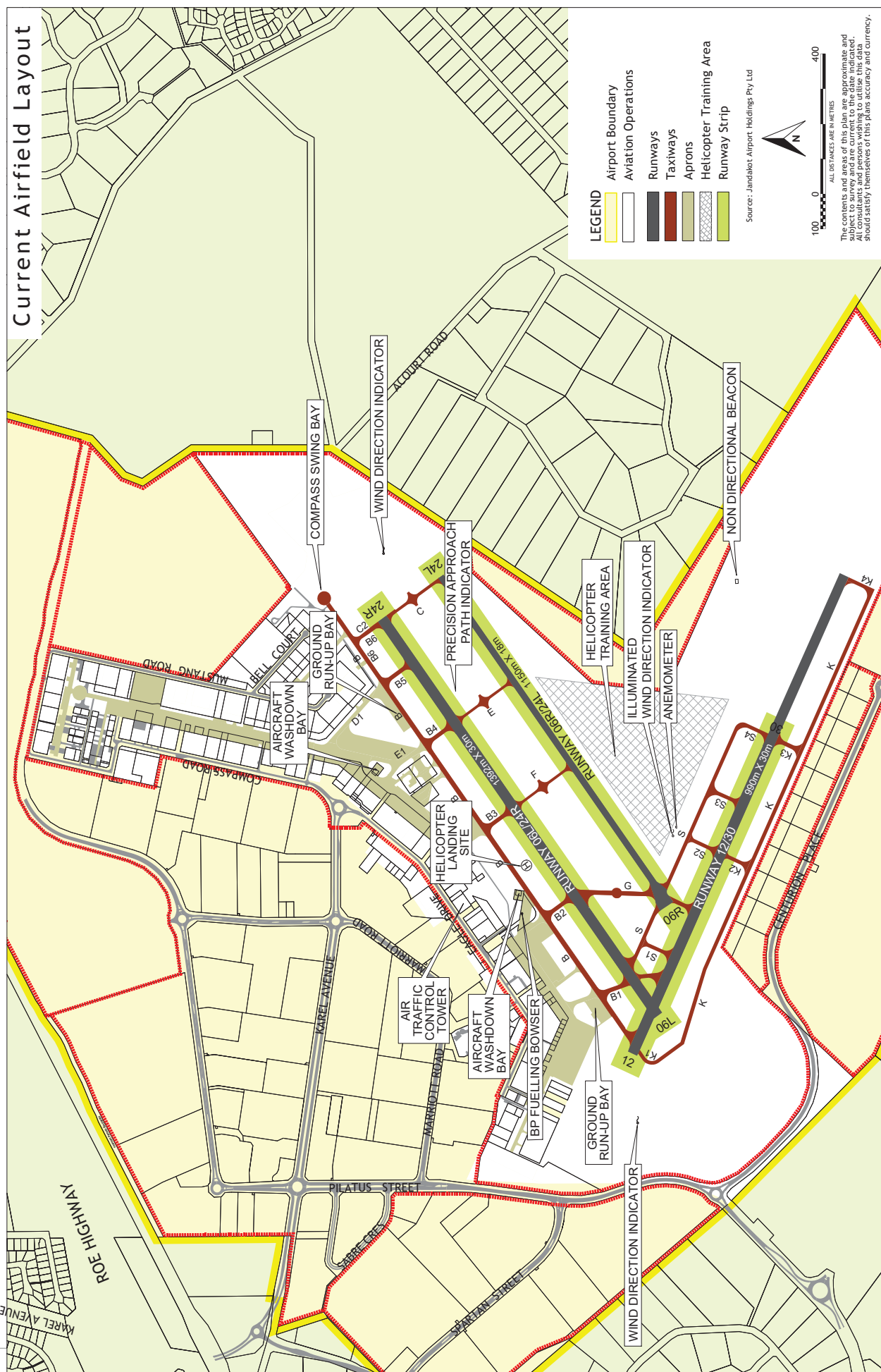
LEGEND

- Airport Boundary
- Aviation Operations
- Runways
- Taxiways
- Aprons
- Helicopter Training Area
- Runway Strip

Source: Jandakot Airport Holdings Pty Ltd

100 0 400
ALL DISTANCES ARE IN METRES

The contents and areas of this plan are approximate and subject to survey and are current to the date indicated. The contents of this plan are not to be used for any purpose other than that for which they were prepared and should satisfy themselves of this plan's accuracy and currency.



4.7 AIRFIELD INFRASTRUCTURE

4.7.1 RUNWAYS

Jandakot Airport has a multi-runway configuration, comprising two NE/SW parallel runways and a SE/NW cross runway. The proposed fourth runway will also run SE/ NW.

The bearing strength of an aerodrome pavement is expressed as a Pavement Classification Number (PCN). Aircraft can operate unrestricted on a runway pavement that has a PCN rating equal to or greater than the Aircraft Classification Number (ACN). The ACN value expresses the relative damaging effect of the aircraft on a pavement for the specified standard subgrade strength.

Runway pavement strengths at Jandakot Airport are designed primarily for aircraft with a maximum take-off weight of 5,700kg. The primary runways do have the capacity to accommodate occasional movements by heavier aircraft. A Pavement Concession may be issued by JAH for aircraft with a maximum take-off weight greater than 5,700kg, dependent on the PCN-ACN assessment of the specific aircraft type and subject to the aircraft wing-span satisfying the taxiway separation requirements.

RUNWAY 06L/24R

Runway 06L/24R is the primary runway and is used for the majority of aircraft operations. Constructed for the opening of the airport in 1963, the runway is currently 1,392m in length and 30m wide. This length is adequate for the current needs of most operators, although some aircraft types may experience payload restrictions on very hot days. For planning purposes, Master Plan 2009 and this Master Plan have allowed for a minor extension at each runway end, potentially providing for an overall length of 1,600 metres.

RUNWAY 06R/24L

Parallel runway 06R/24L was constructed in 1991 to support the increasing pilot training activities. The existing runway length of 1,150 metres and the width of 18 metres is adequate for the touch-and-go circuit training by current types of aircraft used for training and there are no changes proposed to this runway.

RUNWAY 12/30

Constructed for the opening of Jandakot Airport in 1963, runway 12/30 is the primary runway used for aircraft operations in north-westerly and south-easterly wind conditions.

The length of runway 12/30 is 1508 metres and the width is 30 metres.

Less than 15% of all movements at the airport are on runway 12/30 due to the prevailing weather conditions at Jandakot. Because of the nature of the wind conditions that exist for operations to revert to the 12 or 30 directions and the extra runway length preferred for pilot training operations

Due to the circuit capacity restrictions of single runway operations, use of the 12 or 30 runway directions is currently only implemented when cross-winds exceed 12 knots. Once the fourth runway is operational, the 12/30 direction will be used for a higher proportion of flight movements than currently occurs as the standard cross-wind criterion of 10 knots will be implemented in common with other Class D Airspace airports. In terms of movement numbers, runway 12/30 currently has an average of 85 movements per day. Once the fourth runway is operational, at the maximum airfield operating capacity there could be expected to be an average of 126 movements per day on runway 12/30 and 189 movements per day (or 94 touch-and-go circuits) on the fourth runway 12L/30R.

RUNWAY 12L/30R

The development of the fourth runway was first proposed by the Federal Airports Corporation in 1986 to support the growth in pilot training activity.

This new runway, to be called 12L/30R when operational, is planned to be 990 metres long and 18 metres wide, located parallel to the existing runway 12/30. This runway will perform essentially the same role as runway 06R/24L, which is touch-and-go circuit training for aircraft under visual meteorological conditions during daytime hours.

Provision of the fourth runway will not significantly add to the airport's overall movement capacity. The fourth runway will add to efficiency by providing an equivalent level of capacity in any wind condition, with both a primary runway and dedicated parallel training runway that can be used. This will benefit the flying training

schools that can currently be forced to curtail training activities when the 12 or 30 directions are in use due to the airspace capacity restriction of a single runway operation. The fourth runway will be built if it is required and if it is financially viable.

4.7.2 TAXIWAYS

The existing taxiway system will be augmented to support the proposed fourth runway.

The taxiway design was discussed in detail with local Air Traffic Controllers and flying schools to determine the most efficient layout. Particular attention has been given to avoiding surface movement conflict points and the potential for head-to-head taxiing conflicts. The taxiway layout also reduces the amount of time runways are occupied by taxiing aircraft.

Taxiways supporting runways 06L/24R and 12/30 (future 12R/30L) will be 10.5 metres wide meeting Code B standards, and taxiways supporting runways 06R/24L and fourth runway 12L/30R will be 7.5 metres wide meeting Code A standards.

The taxiway layout is shown in Figure 4.4

4.7.3 RUNWAY END SAFETY AREAS

A runway end safety area (RESA) is provided at the end of a runway strip for safety reasons, in the event of an aircraft undershooting or overrunning the runway. MOS Part 139 requires provision of RESAs for new runways and existing runways when lengthened, unless the runway is Code 1 or 2 and is not an instrument runway. Thus RESAs exist for runways 06L/24R and 12/30 (future 12R/30L) at Jandakot Airport. The fourth runway will not require RESAs.

As the critical design aircraft is Code 2 for both runways 06L/24R and 12R/30L, in accordance with MOS Part 139, the minimum required length of a RESA is 60m (being twice that of the associated runway width). RESAs must be prepared or constructed so as to reduce the risk of damage to an aeroplane, enhance aeroplane deceleration and facilitate the movement of rescue and fire fighting vehicles. As most aircraft operating at Jandakot Airport have a maximum take-off weight of below 5,700kg, the RESA surface can be grass or gravel with sufficient strength to meet the above requirements.

4.7.4 PUBLIC SAFETY ZONES

Public Safety Zones (PSZ's) also termed Public Safety Areas (PSA's) or Runway Protection Zones (RPZ's) are designated areas of land at the end of airport runways within which development may be restricted in order to control the number of people on the ground at risk of injury or death in the event of an aircraft accident on take-off or landing.

While air crashes are rare events and Australia has an excellent safety record, there will always be an inherent risk associated with the operation of aircraft around airports. The consideration of PSAs in land use planning can further reduce this already low risk.

The National Airports Safeguarding Framework (NASF) is a national land use planning framework which has introduced a new guideline in November 2018 to provide guidance on the planning of Public Safety Areas (PSA's). Guideline I - Managing The Risk In Public Safety Areas At The Ends Of Runways. The guideline mentions the different PSA models that have been applied around the world such as the United Kingdom (UK), the Netherlands and United States of America. Queensland was the only state in Australia which had a recommended policy for PSA's.

JAH prepared a Major Development Plan (MDP) for the extension of runway 12/30 and taxiway system which was approved by the Federal Government in June 2016. The MDP incorporated provision of PSA's based on the US Federal Aviation Administration (FAA) requirements. The PSA's extended 300m from the end of each runway strip and were contained within the airport boundary, with the exception of a small portion at the north-eastern end of Runway 06R/24L which falls onto land zoned "Rural – Water Protection" under the Metropolitan Region Scheme.

The US FAA is a recognized and a significant aviation authority, with many ICAO rules and regulations being based or originating on work done by FAA.

Planning at Jandakot Airport to date has been based on a PSA consistent with the MDP and the Master Plan maintains this consistency.

The WA State Government does not yet have a policy addressing PSA's, and at the time of drafting this Master Plan has yet to create a policy based on the recently published NASF guidelines.

Whilst there is no policy yet, Jandakot Airport will continue to work with the State on planning policies to implement airport safeguarding including consideration of PSA's in local planning in the airport environs.

Figure 4.4 illustrates the PSA's at each of the future runway ends.

4.8 NAVIGATIONAL AIDS AND LIGHTING

4.8.1 AIRFIELD LIGHTING

Runways 06L/24R and 12/30 (future 12R/30L) are equipped with medium intensity LED runway lighting, LED holding point lighting and blue LED edge taxiway lighting. The Northern, Central and Southern aprons are equipped with green LED centreline lighting.

Existing runway 06R/24L is not lit and therefore only permits operations during full daylight hours. As the proposed fourth runway 12L/30R will fulfil the same operational use as 06R/24L (being touch-and-go circuit operations in visual meteorological conditions), lighting will not be installed on this runway.

4.8.2 NON-DIRECTIONAL BEACON

Airservices Australia provides a Non-Directional Beacon (NDB) at Jandakot Airport to facilitate location navigation for aircraft arrivals and departures. Master Plan 2009 acknowledged that the development of the fourth runway would require the relocation of the NDB.

Airservices undertook a review of NDB locations around Australia and has subsequently taken some NDBs out of service. However, it has been determined that the NDB at Jandakot Airport will need to be retained and upgraded. Due to the runway configuration at Perth Airport and Perth Airport flight tracks, other navigational aids, such as an Instrument Landing System (ILS) or Distance Measuring Equipment (DME), are not considered suitable for Jandakot Airport.

A large part of the pilot training syllabus involves flight practice using an NDB. The State Aviation Strategy (outlined in Section 2.3.1) identifies that the lack of access to common use navigation aids, such as an NDB, is a concern to the general aviation sector. Local flying schools have confirmed the importance of the NDB for pilot training activity at Jandakot. In addition, the majority of the aging aircraft fleet at Jandakot are not equipped with suitable equipment for an alternate instrument procedure. It is estimated that the NDB will be required

for at least 5 years to allow time for aircraft operators to install newer navigational equipment to suit alternate instrument procedures.

Following analysis of procedural design and engineering requirements by Airservices and JAH, a preferred site for the NDB relocation has been selected in the south-west corner of the airside area as shown in Figure 4.4. The specific requirements for the siting of a NDB are detailed in the Manual of Standards. The main limitations affecting suitable locations for the NDB are the proximity to buildings and equipment such as overhead power and telephone lines, and the Obstacle Limitation Surfaces and Procedures for Air Navigation Services - Aircraft Operations which is the boundary of airspace protected by Commonwealth Legislation from intrusion or interference by anything which could affect aviation safety.

4.8.3 MOVEMENT AREA MARKINGS AND MARKERS

The airport is equipped with the prescribed movement area markings and markers, including a Movement Area Guidance (MAG) signage system. The MAG system is unlit and due to the low volume of movements at night there are currently no plans to provide illuminated signs.

4.8.4 PRECISION APPROACH PATH INDICATOR

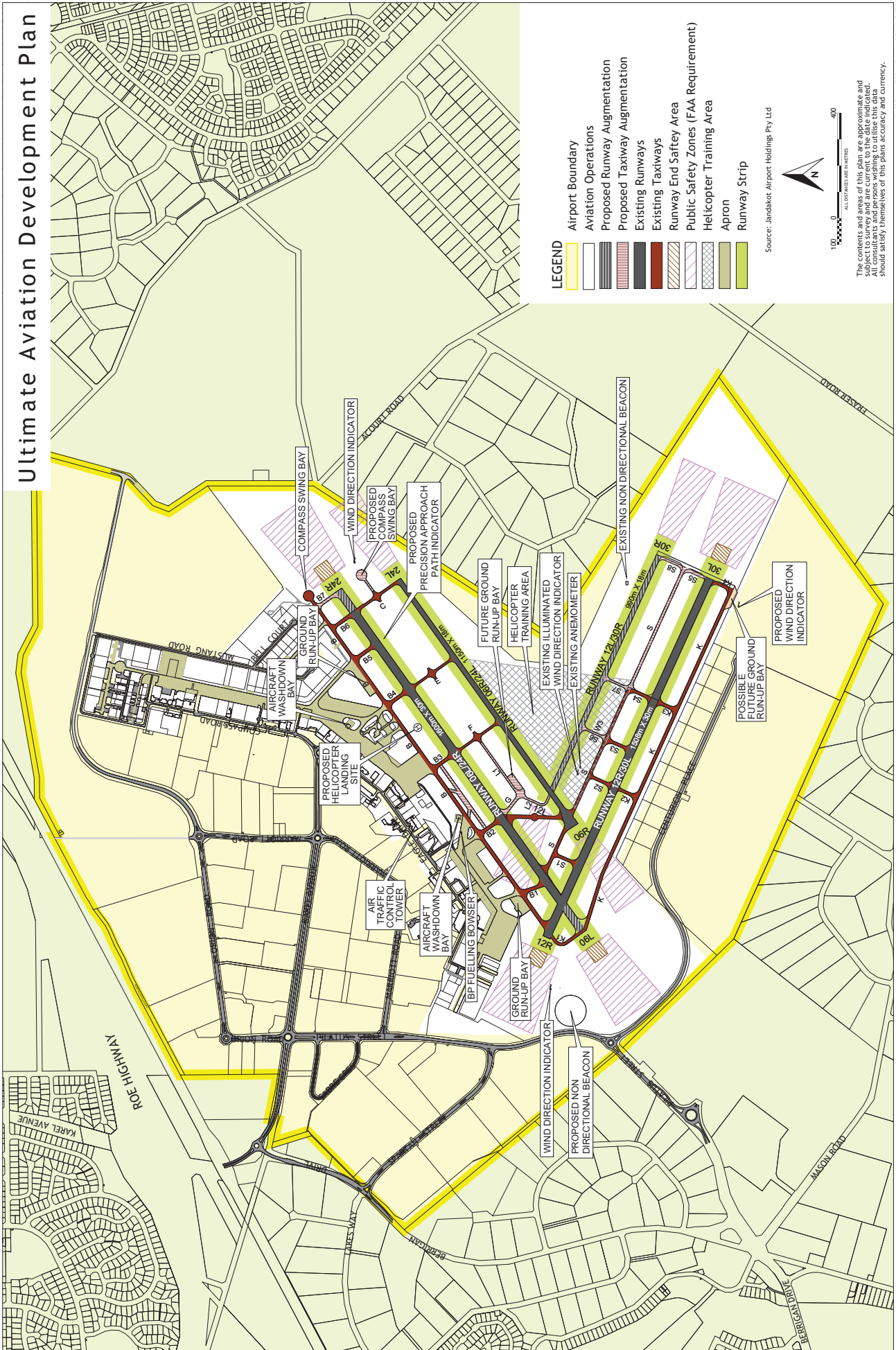
The runway 24R approach has a Precision Approach Path Indicator (PAPI), which will be relocated as part of the runway 24R extension. A preliminary review of the Obstacle Assessment Surface for the PAPI relocation has been conducted in accordance with the MOS Part 139 standards and no obstacles were identified.

4.8.5 WIND INDICATORS

Wind indicators are required for runways with non-precision approach operations. The wind indicator, or windsock, provides pilots with a visual representation of the wind direction and velocity.

ILLUMINATED WIND INDICATOR

The illuminated wind indicator, currently located north of taxiway S4, will need to be relocated when the fourth runway is constructed. The illuminated wind indicator will be relocated at least 21.5m north of taxiway S4 in order to comply with clearance requirements from this taxiway and to be below the transitional airspace surfaces associated with runway 12/30 (future 12R/30L) and the proposed fourth runway.



NON-ILLUMINATED WIND INDICATORS

Non-illuminated wind indicators are located close to the runway 24L and 24R thresholds, and near the runway 12 threshold.

4.8.6 AUTOMATIC WEATHER STATION

The Bureau of Meteorology's existing automatic weather station (AWS), which includes an anemometer mast to measure wind speed, is co-located with the Illuminated Wind Indicator.

Construction of the fourth runway will require the AWS to be relocated due to the height of the anemometer mast infringing into the proposed new runway's Obstacle Limitation Surface (transitional surface). Discussions with the Bureau of Meteorology have identified two possible preferred locations which will satisfy the communication and power requirements of the AWS. These locations are the existing Non- Directional Beacon site and the proposed Non- Directional Beacon relocation site. The exact location for the AWS relocation will be determined as part of the detailed NDB relocation design brief.

4.8.7 AERODROME BEACON

An aerodrome beacon is a visual cue for pilots that is required to be visible from all angles of aircraft operations and not shielded by any obstacles. An aerodrome beacon is located on top of the Air Traffic Control tower and is activated when the runway lights are activated.

4.9 GENERAL AVIATION FACILITIES

4.9.1 APRONS AND AIRCRAFT PARKING

Sealed aprons are provided in front of most existing aircraft hangar building areas. It is a JAH requirement that all new hangar developments provide adequate apron space for aircraft parking.

JAH also provides both hardstand and grass aircraft parking bays at various locations within the apron area. These bays are available for long-term or short-term (casual) aircraft or helicopter parking. Tie-down facilities are provided as required on some hardstand areas.

4.9.2 AVIATION FUEL

The two aviation refuellers operating at Jandakot Airport are Air BP and Viva Energy. Jet A-1 and AVGAS fuel is mainly provided to aircraft by mobile re-fuelling vehicles. Air BP also has a fuel storage facility and a dispensing bowser on the southern apron.

4.9.3 COMPASS SWING BAY

Compass swings are required as a component of some aircraft maintenance activities to determine and reduce magnetic deviation coefficients and record the residual deviations.

The current compass swing bay at the northern end of taxiway B is closer to the hangar at the end of Bell Court than what is suggested in the design guidelines detailed in Advisory Circular 139-15, however surveys over the last ten years have indicated that the hangar has no magnetic effect on the swing bay. A potential new compass swing bay position has been identified to the north of taxiway C3/C4 (between runways 06L/24R and 06R/24L).

4.9.4 GROUND RUN-UP

Engine ground running is required for pre-flight run-up and for engine testing after maintenance. The airport has two existing designated engine ground run-up bays, with a further two potential locations identified.

The existing northern bundled run-up bay is located opposite the north-eastern end of runway 06L/24R, adjacent to taxiway B5. This bay is located close to major aircraft maintenance facilities and is frequently used for engine run-up after maintenance or overhaul.

The existing southern run-up bay is located near the Royal Aero Club of WA building adjacent to taxiway B1.

An un-bundled central run-up bay is proposed between the two 06/24 runways adjacent to taxiway L1 to be used primarily for proposed runway 12L departures.

A fourth possible run-up bay could be provided at the end of new taxiway K to serve aircraft operating on runways 30R and 30L, depending on operator requirements.

The tie down run-up position on taxiway G is no longer used and will be decommissioned when proposed runway 12L/30R is constructed.

4.9.5 AIRCRAFT WASH BAYS

There are two common-user aircraft wash bays which are currently provided free-of-charge to operators. The bays are located on the southern and central aprons, away from the Jandakot Underground Water Pollution Control Area.

4.10 AIR TRAFFIC CONTROL

Jandakot Airport is designated as a general aviation aerodrome and operates to Class D Airspace procedures. The Jandakot Control Zone encompasses the airspace within a 3 nautical mile radius of Jandakot Airport, with an airspace upper limit of 1,500 ft (457.2 meters) Above Mean Sea Level.

4.10.1 AIR TRAFFIC CONTROL TOWER

Air Traffic Control (ATC) is administered by Air services Australia from a control tower located centrally along the airfield apron. The interior of the tower was refurbished in 2013.

4.10.2 TOWER LINE OF SIGHT

The ATC Tower is required to be sited in a location that enables clear lines of sight, unimpaired by direct

or indirect external light sources such as apron lights, car parking lights, surface traffic and street lights and reflective surfaces. There is no development proposed in this Master Plan that will compromise appropriate lines of sight from the ATC Tower.

4.10.3 HOURS OF OPERATION

The current hours of operation of the ATC Tower are:

- 7.00 am to 9.00 pm weekdays (or 7.00 am to 8.00 pm June to August only); and
- 8.00 am to 6.00 pm weekends.

The ATC Tower is currently operational for over 95% of all movements. There is no expected change to ATC Tower operating hours as a result of the airfield development as the proposed fourth runway will not be lit and will therefore be used in daylight hours only.

The airport continues to operate while the ATC Tower is closed, with set Common Traffic Area Frequency procedures for pilots to make mandatory radio calls advising their position and to sequence themselves within the Jandakot Control Zone.

4.10.4 NOMINATING DUTY RUNWAYS

Runway selection is determined by wind direction and strength as pilots prefer to take-off and land into the prevailing wind. During ATC Tower operating hours, the Air Traffic Controllers stipulate which runway direction must be used. When the tower is closed, the pilot will determine which runway to use based on the direction and speed of the wind.

Currently the two parallel runways (06L/24R and 06R/24L) are used for approximately 85% of all movements and runway 12/30 is used for 15% of all movements. While use of the runway 06 and 24 directions is consistent throughout the year, use of the runway 12 and 30 directions is very seasonal. Nearly 95% of all movements in the runway 12 direction occur between October and May due to the easterly winds that favour use of runway 12. The runway 30 direction is generally only used in north-westerly winds experienced during periods of stormy weather (currently less than 6% of all movements use runway 30).

Jandakot Airport procedures will revert to the standard 10 knot crosswind criteria for use of the 12 and 30 runway directions once the proposed fourth runway is constructed. It is expected that the use of the 12 and 30 runway directions will then increase from 15% to 25% of all movements.

4.10.5 SEQUENCING OF AIRCRAFT

The high volume of aircraft traffic and radio frequency congestion add to convoluted sequencing requirements and instructions when single runway 12/30 is in use. The addition of the proposed fourth runway 12L/30R will minimise and simplify sequence instructions to aircraft as arriving aircraft will no longer be required to be sequenced with aircraft conducting circuits, thereby facilitating additional capacity for training aircraft.

4.11 HELICOPTER OPERATIONS

4.11.1 LANDING SITES

Jandakot Airport currently has two helicopter landing sites. The central pad is located in front of the ATC Tower and is used mainly for itinerant (casual) helicopter operations. The landing site will be relocated 300m north-east, adjacent to taxiway B4 as shown in Figure 4.4, to make way for a taxiway parallel to B3 that will act as a bypass lane during times of heavy surface

traffic. The proposed helicopter landing site remains within line of sight of the ATC Tower. Due to increased helicopter movements in the helicopter precinct a second helicopter landing site (the eastern pad) was constructed in 2015. This pad is situated 50m north east of taxiway C, opposite the helicopter precinct, and also has direct line of sight to the control tower.

During tower hours all helicopter movements are controlled by ATC. During CTAF hours all helicopter arrivals/departure are required to occur on either of the two helicopter landing sites or on the runways.

4.11.2 TRAINING AREA

A dedicated grass helicopter training area is provided in the area bounded by the runway 06R/24L strip, taxiway S and the airport boundary as shown in Figure 4.4. An auto-rotative aiming point is identified by an asphalt marker within the training area.

Unless otherwise directed by ATC, helicopter operations in the training area are required to be conducted 100m away from the runway and are limited to a maximum height of 200ft (61m) above ground level.

When the 06 and 24 runway directions are in use, helicopter training can also be conducted on runway 30. Similarly, the runway 06R/24L strip can be utilised for helicopter training activities when the 12/30 runway is in use. This allows three helicopters to conduct training concurrently, subject to ATC workload and approval.

Helicopter aiming points will be positioned between each of the parallel runway systems to assist with ATC control and appropriate separation of helicopter training activity.

5. NON-AVIATION DEVELOPMENT

This chapter outlines a development strategy for the precincts identified for non-aviation (mixed business) development in Chapter 3. The purpose of the strategy is to provide development direction guided by sound on-airport and off-airport planning principles to achieve the objectives of the Master Plan.

Airport development since Master Plan 2014 was approved includes:

- The extension of Pilatus Street to Jandakot Road beyond the boundary of the airport, to provide another access point for the airport;
- Clearing, earthworks and construction of roads and services for Precincts 6 and 6A;
- Upgrade of water supply, streetlights and footpath to Eagle Drive;
- Installation of a secondary water supply and pump station; and
- Development of a number of mixed business sites.

5.1 NON-AVIATION DEVELOPMENT OBJECTIVES

The non-aviation development objectives of JAH are consistent with the development objectives of the airport site as identified at Section 1.9. The non-aviation development objectives are to:

- Integrate the airport's overall aviation and non-aviation development;
- Integrate the current regional and local planning schemes surrounding the airport with the aviation and non-aviation land uses, as required by the *Airports Act 1996*;
- Ensure that development provides a pleasant environment for visitors to, and workers at, the airport; and
- Provide alternative revenue streams to diversify income and reduce the risk of a single source income.

5.2 DEVELOPMENT DRIVERS

5.2.1 COMPETITIVE ADVANTAGE

Jandakot Airport is located 16km south of the Perth city centre and is a short distance from direct access points to Kwinana Freeway and Roe Highway. During off-peak periods, travel time by car is 15-20 minutes to the Perth

CBD and 35 minutes to Perth's east, west and northerly suburbs and industrial areas.

Strengths of the Perth metropolitan region and Western Australia that are especially relevant to non-aviation development include:

- Proximity to the south east Asian market - which is projected to enjoy strong economic growth in the coming decades;
- Strong resource industries - with the strong mining, agricultural, oil and gas industry base, the long term economic outlook for Western Australia is strong;
- Good lifestyle - Western Australia enjoys a quality lifestyle;
- Attractive tourist destination - Western Australia is expected to continue to grow as a tourist destination;
- Above average population growth - by maintaining a strong economic base and providing a quality lifestyle, Western Australia is experiencing strong population growth;
- High demand for commercial and industrial property - the Perth metropolitan region is experiencing a shortage of commercial and industrial land. As a result, the non-aviation land at Jandakot Airport offers attractive opportunities, particularly given its convenient access to the port of Fremantle and the surrounding major regional and district road systems and its flexibility in providing for larger lot sizes;
- Economic stability - Western Australia's economy remains stable in the current difficult economic conditions being experienced worldwide;
- Political freedom and stability - Western Australia enjoys a stable political and social environment;
- High quality infrastructure - development and growth in the Perth metropolitan region is supported by well managed governance and high quality infrastructure; and
- Educated and skilled workforce - economic growth in the Perth metropolitan region is supported by an educated and skilled workforce.

5.2.2 COMMERCIAL OPPORTUNITIES

Based on the development of Jandakot Airport to date, demand for non-aviation development is envisaged to predominantly be warehouse, business, office, workshop

and storage type uses. Jandakot Airport has become an oil and gas hub with tenants such as General Electric (Oil & Gas), Halliburton, Schlumberger, Oceaneering and IOT Group based at the airport.

5.2.3 DIVERSIFIED INCOME STREAM

The Commonwealth lease for Jandakot Airport stipulates that the lessee (JAH) must maintain the runways, taxiways and all parts of the airport. The incomes derived from general aviation activities falls well short of that required to maintain the airport in accordance with the lease. The shortfall in income was one of the key reasons for the “privatisation” of airports by the Commonwealth. It is essential therefore that the lessee derives income from other sources.

The lease provides for the development of airport land not required for aviation purposes. Development of this land, as outlined in this Master Plan will provide essential income for the maintenance of the airport.

5.3 DEVELOPMENT STRATEGY

The 622 hectares of land which comprise the Jandakot Airport estate has been divided into six precincts (plus sub-precincts), as shown in Figure 3.1, with the three land uses as outlined in Chapter 3 being ‘Conservation’, ‘Aviation Operations’ and ‘Mixed Business’. The land use identified for the precincts will facilitate the identification of specific activities and will assist with the development programming and marketing.

The precincts have been formulated with regard to:

- Location and access;
- High value bushland;
- Aviation constraints (e.g. aircraft noise and airspace requirements);
- Flexibility of use and subdivision; and
- Provision of infrastructure.

5.4 RECENT NON-AVIATION DEVELOPMENT

As noted at Section 2.2.1, the following MDPs for non-aviation development were approved since, or were approved shortly prior to, the approval of the Master Plan 2014, and have since been completed:

- ALDI Distribution Centre, located within Precinct 4; approved by the Minister for Infrastructure and Regional Development on 12 August 2014; and

- K Mart Distribution Centre, located within Precinct 5; approved by the Minister for Infrastructure and Regional Development on 12 January 2015.

These developments comprise a total built footprint area of approximately 87,000sqm and will provide direct employment for approximately 420 staff.

Non-aviation development that has occurred over the last 5 years is summarised as follows:

- Civil and services infrastructure for Precinct 6 and 6A;
- Extension of Pilatus street from the airport to the Berrigan Drive/Jandakot Road intersection; and
- Commercial development (inclusive of the MDPs noted above): 460,000sqm of land, 138,000sqm of warehouse space, 17,000sqm of workshop space and 10,000sqm of office space.

Detail on the non-aviation development that has occurred at Jandakot Airport to-date more generally is provided at Section 1.6, and also at Section 5.2.2 which notes a number of oil and gas industry tenants that have chosen to locate at Jandakot Airport.

5.5 MIXED BUSINESS PRECINCTS

Development on airport land is not subject to State or Local Government planning processes, however, the designation of the Mixed Business Precincts is consistent with the City of Cockburn’s ‘Mixed Business’ zone.

5.6 DEVELOPMENT OVER THE NEXT EIGHT YEARS

Over the eight year period of this Master Plan, it is forecast that the following floor space could be developed, providing for approximately 2,028 employees:

- 146,250 square metres of warehouse space;
- 36,000 square metres of manufacturing space; and
- 20,250 square metres of office space.

The timing of this development will be subject to the market and prospective tenant demand for commercial floor space as experienced in the Perth metropolitan region and is expected to be primarily located within Precincts 4, 5 and 6.

The economic benefits of this level of floor space being developed and people employed are outlined in Section 1.7.

5.7 SIGNIFICANCE OF NON-AVIATION DEVELOPMENT

As outlined in Chapter 1 it is envisaged that ultimate non-aviation development of Jandakot Airport will occur within the 20 year period of this Master Plan, and will accommodate a total of approximately 725,000 square metres of non-aviation floor space, comprising 525,000 square metres of warehouse, 128,000 square metres of manufacturing, 67,000 square metres of office and 5,000 square metres of retail (already constructed) floor space. Upon this ultimate development it is expected that approximately 6050 employees associated with non-aviation development will be located on the airport estate.

5.8 CONSISTENCY WITH STATE AND LOCAL GOVERNMENT PLANNING FRAMEWORKS

5.8.1 STATE GOVERNMENT PLANNING FRAMEWORK

The State Government recognises Jandakot Airport as a vital piece of infrastructure and has identified the airport as a specialised activity centre. As the land on which the airport is located is owned by the Commonwealth Government and the airport is subject to Commonwealth legislation, State planning laws do not apply to the airport site.

The State's planning framework encourages the non-aviation development of the airport, with the planning documents outlined in Chapter 2 designating the airport a 'Specialised Activity Centre', with available industrial land that can be developed in the short term to contribute to local employment and the economic development of the State.

The proposed non-aviation development of the airport is consistent with the State planning framework as it will support the growth of the aviation sector of the airport and has identified land uses consistent with the local government planning framework.

5.8.2 LOCAL GOVERNMENT PLANNING FRAMEWORK

The land uses proposed for the non-aviation development ('Mixed Business') precincts on the airport are based on the City of Cockburn's 'Mixed Business' zone to provide a consistent approach to land use planning between the airport and the surrounding area. This approach is consistent with the City of Cockburn's Local Commercial and Activity Centres Strategy (2012)

which recognises Jandakot Airport as a Specialised Centre, (as per the State planning framework), and a strategic employment centre that is forecast to provide more businesses and jobs into the future.

5.8.3 SURROUNDING LAND USE

Land located immediately south and west of the airport is predominantly zoned 'Resource' under the City of Cockburn Town Planning Scheme No. 3. This 'Resource' zoned land is predominantly rural-residential in use and provides protection to the Jandakot Underground Water Protection Control Area. More intense residential development on surrounding land zoned 'Resource' would not be appropriate due to its proximity to the airport and the Jandakot Underground Water Protection Control Area.

Roe Highway borders the north of the airport and creates a physical barrier between the airport and residential areas located further north within the City of Melville.

Land located immediately east of the airport varies and includes 'Resource' zoned land under the City of Cockburn Town Planning Scheme No. 3 and land reserved for 'Parks and Recreation' and land reserved for 'Public Purposes – Special Uses' under the Metropolitan Region Scheme, each of which is reflected under the City of Cockburn Town Planning Scheme No. 3 and the City of Canning Town Planning Scheme No. 42, respectively.

6. GROUND TRANSPORT PLAN

Additional transport links to the Perth Metropolitan Region are essential to maximise Jandakot Airports' potential for aviation and non-aviation land uses.

Since approval of the Master Plan 2005, JAH has contributed \$3.8 million for the construction of a bridge over the Roe Highway railway track to negate the dangerous level crossing that existed at the entrance to the airport. The entry road, Karel Avenue, has been upgraded to a four-lane carriageway with bicycle lanes in both directions. JAH has contributed \$3.8 million to the Berigan Drive Upgrade project which included the extension of Pilatus Street beyond the airport boundary to Jandakot Road. JAH has also agreed to contribute \$2.5 million to the Karel Avenue Upgrade Project. The internal road network has been built to facilitate the development of the airport as provided for in this Master Plan 2020.

6.1 ROAD ACCESS

Jandakot Airport's location enables good access via the surrounding key road network to the wider Perth metropolitan region. However, during morning and afternoon peak periods the road network surrounding the airport experiences significant traffic volumes, primarily due to traditional metropolitan peak periods unrelated to Jandakot Airport traffic, resulting in some of these roads and intersections operating beyond their design capacity.

The key primary distributor roads providing access to Jandakot Airport include Kwinana Freeway, Roe Highway and South Street. Other key distributor roads include Ranford Road, Berrigan Drive, Karel Avenue and Jandakot Road.

Access to Jandakot Airport is currently provided from Berrigan Drive to Pilatus Street (from the south) or Karel Avenue (from the north). Karel Avenue has been upgraded by JAH from a two-lane undivided road to a four-lane divided road from Marriott Road up to the Berrigan Drive intersection. The section of Pilatus Street from Karel Avenue to Marriott Road is also constructed to this standard. All other roads within the airport boundary are two-lane divided or undivided roads.

Karel Avenue is currently being upgraded from a two-lane to a four-lane divided road from Berrigan Drive to Roe Highway.

Berrigan Drive is two-lanes undivided from Karel Avenue to Pilatus Street and then two-lanes divided west of Pilatus Street. The southern section of Pilatus Street was constructed to two-lane divided standard by the City of Cockburn in 2017 to complete the southern link from Berrigan Drive into Jandakot Airport.

Jandakot Road is currently an undivided two-lane road except for the western end which was upgraded to four-lane divided standard in 2017 when the Berrigan Drive/Jandakot Road/Dean Road/Pilatus Street intersection was upgraded to a signalised four-way intersection by the City of Cockburn. The section of Jandakot Road from Solomon Road to Fraser Road has also been upgraded to four-lane divided standard in 2020.

Freight traffic is appropriately accommodated on the surrounding road network. Rigid trucks up to 12.5m and semi-trailers up to 19m long (with various other restrictions on maximum load, height, width etc.) are 'as-of-right' vehicles that are generally allowed to use any road in Western Australia without requiring special permits. Almost all roads in WA, except sections of four roads in the metropolitan area, are automatically included in the Restricted Access Vehicles (RAV) Network 1, which is permitted for several vehicle combinations such as short B-doubles up to 20m long (maximum mass 50 tonnes). Kwinana Freeway (north of Roe Highway), Jandakot Road, Pilatus Street, Berrigan Drive (east of Kwinana Freeway) and Karel Avenue (south of Roe Highway) are all included in RAV Network 4, which allows 2-trailer vehicle combinations up to 27.5m long and maximum load up to 87.5 tonnes. Roe Highway and Kwinana Freeway south of Roe Highway are included in RAV Network 7, which allows 2 or 3-trailer vehicle combinations up to 36.5m long and maximum load up to 107.5 tonnes. The major roads within Jandakot Airport are also included in RAV Network 4, including Karel Avenue (west of Marriott Rd), Pilatus Street, Spartan Street, Marriott Road and Orion Road (west of Marriott Road).

6.2 PROPOSED ROAD NETWORK

Access to Jandakot Airport is via the following connections:

1. Existing access from Karel Avenue/Berrigan Drive intersection is being upgraded to a two-lane roundabout;

2. Existing access from Berrigan Drive via Spartan Street (left in/left out only at Berrigan Drive);
3. Existing access from Pilatus Street via Jandakot Road/ Berrigan Drive/Dean Road/Pilatus Street signalised intersection.
4. Karel Avenue Upgrade Project – Main Roads WA is currently widening Karel Avenue to four lanes divided from Farrington Road to Jandakot Airport. Funding has been sourced from JAH, Metronet and the State Government; and
5. Proposed East Link road – consultation with State and Local Governments resulted in a plan to connect to Johnston Road through to Ranford Road. Accordingly the State Government has amended the Metropolitan Region Scheme to include an “Other Regional Roads” Reservation for the East Link road from Ranford Road to the Jandakot Airport boundary at Johnston Road. JAH propose to extend Orion Road to meet Johnston Road at the boundary of the airport.

In March 2018 the State Government finalised its Perth and Peel @ 3.5million suite of land use planning and infrastructure frameworks. Jandakot Airport is located within the area of the South Metropolitan Peel Sub- regional Planning Framework. Significantly, it proposes to expand the network of regional roads to include Jandakot Road, Pilatus Street and Orion Road as ‘integrator arterial’ roads. In that Framework these are treated as the same status as existing Other Regional Roads Reservations in the Metropolitan Region Scheme. (In terms of the naming system in the Main Roads WA functional road hierarchy, various ‘integrator arterial’ roads correspond to District Distributor A and B or Regional Distributor classifications.)

Figure 6.1 shows the current road network, with the proposed road network comprising the roads identified as ‘Future District Distributor A’ or ‘B’. It is anticipated that all of these road network connections identified as Future District Distributor A or B will be in place within the 8 year time frame of this Master Plan. Within the airport these will be constructed as two-lane roads. Jandakot Airport does not plan to upgrade these roads to four-lane standard within the airport.

6.3 TRAFFIC GENERATION – EIGHT YEAR AND ULTIMATE DEVELOPMENT IMPACT

Traffic generation from the full development of Jandakot Airport was previously forecast at 23,100 vehicles per day using the Main Roads WA ROM traffic model based on a development scenario that anticipated a workforce of approximately 8,050 employees at Jandakot Airport, including all aviation and non-aviation related land uses.

These projections remain unchanged for Master Plan 2020.

The proposed road network on the Jandakot Airport estate has been capacity tested to both the 2039 ultimate development traffic forecast of 23,100 vehicles per day, and the eight year development traffic forecast of 12,600 vehicles per day (based on approximately 4,400 workforce), which has confirmed that the proposed road network can accommodate the forecast traffic volumes.

6.4 TRAFFIC FORECAST

Road modelling has been undertaken for year 2039. The traffic modelling assumes full development of Jandakot Airport by this time.

Figure 6.2 shows the modelled total daily traffic flows at 2039 and the traffic associated with land uses at Jandakot Airport, in the context of the general regional traffic volumes unrelated to Jandakot Airport. This demonstrates that whilst traffic accessing Jandakot Airport uses the surrounding road network, the airport traffic has less impact on the surrounding network than the impact that will be felt within the airport site as a result of through traffic from the surrounding area.

The State Government is currently undertaking significant road upgrades on Kwinana Freeway and Armadale Road in the vicinity of Jandakot Airport to address existing traffic congestion on these primary regional roads. However, regional traffic growth over the next twenty years is anticipated to use up all that additional capacity, resulting in traffic congestion again during peak periods. The new ‘integrator arterial’ roads through the Jandakot Airport site could be attractive short-cuts for some of that regional traffic in this longer term planning horizon.

The traffic modelling indicates that Jandakot Airport traffic is anticipated to represent the following proportion of total traffic on key road links in 2039:

- 35% on Karel Avenue extension east of Berrigan Drive (within the airport estate) – 9,100 airport-related vehicles per day out of a total 25,800 vehicles per day;
- 59% on Pilatus Street (within the airport estate) – 9,500 airport-related vehicles per day out of a total 16,000 vehicles per day;
- 23% on the East Link road (within the airport estate) – 4,200 airport-related vehicles per day out of a total 18,300 vehicles per day;
 - 22% on Karel Avenue (northwest of Berrigan Drive)
 - – 10,000 airport-related vehicles per day out of a total 44,600 vehicles per day;
 - 15% on Berrigan Drive (southwest of Jandakot Road) – 5,400 airport-related vehicles per day out of a total 37,000 vehicles per day;
 - 12% on Jandakot Road (southeast of Berrigan Drive) – 3,000 airport-related vehicles per day out of a total 24,400 vehicles per day; and
 - 6% on Berrigan Drive (south of Karel Avenue) – 1,100 airport-related vehicles per day out of a total 19,700 vehicles per day.

6.5 ROAD UPGRADES

Traffic modelling indicates significant growth of regional traffic in the vicinity of the airport. A number of upgrades will be required to the existing road network to accommodate the increased traffic demand in this area, primarily associated with the growth of regional traffic unrelated to Jandakot Airport, as demonstrated in Figure 6.2.

The road upgrades required around Jandakot Airport, triggered by regional growth and the airport development, are shown in Figure 6.3 and are summarised as follows:

- Karel Avenue between Berrigan Drive and Roe Highway which is currently being upgraded to a four-lane divided road.;
- The Berrigan Drive and Karel Avenue intersection is being upgraded to a two-lane roundabout to replace the existing single-lane roundabout in conjunction with the Karel Avenue upgrade works in 2020;

- The East Link road requires a two-lane arterial road with turn lanes at controlled junctions to be built along the Johnston Road alignment to join Ranford Road. JAH will then build the extension of Orion Road to meet Johnston Road at the airport boundary. The timing of these works is yet to be determined. The 'Other Regional Roads' reservation in the Metropolitan Region Scheme from the airport boundary to Ranford Road is wide enough for this new road to be upgraded to four-lane divided if required in future; and
- Pilatus Street has been constructed as a two-lane arterial road with roundabouts or with turn lanes at controlled junctions. The road reserve is wide enough for this road to be upgraded to four-lane divided if required in future.

In addition to the road upgrades above there are other longer term regional road capacity issues on the surrounding regional road network (e.g. Kwinana Freeway, Roe Highway, Ranford Road and Armadale Road). These issues are related primarily to regional traffic generation, unrelated to Jandakot Airport and are matters to be resolved by State and Local Governments.

6.6 RESPONSIBILITY AND FUNDING OF ROAD UPGRADES

The proportion of total traffic that is associated with the airport, as discussed in Section 6.4 and shown in Figure 6.2.

6.6.1 EAST LINK ROAD

The East Link road located on the Jandakot Airport estate will be constructed and maintained by JAH. The cost of the intersection of this road at the airport boundary with Johnston Road (controlled by Local Government) will be determined and agreed through discussions between JAH and the relevant Local Governments. JAH has recommended an unsignalised T-intersection to discourage unnecessary traffic travelling through the airport precinct.

Ownership, responsibility and maintenance of the intersection and Johnston Road (off the airport) will remain with Local Government.

FIGURE 6.1 - ROAD HIERARCHY PLAN

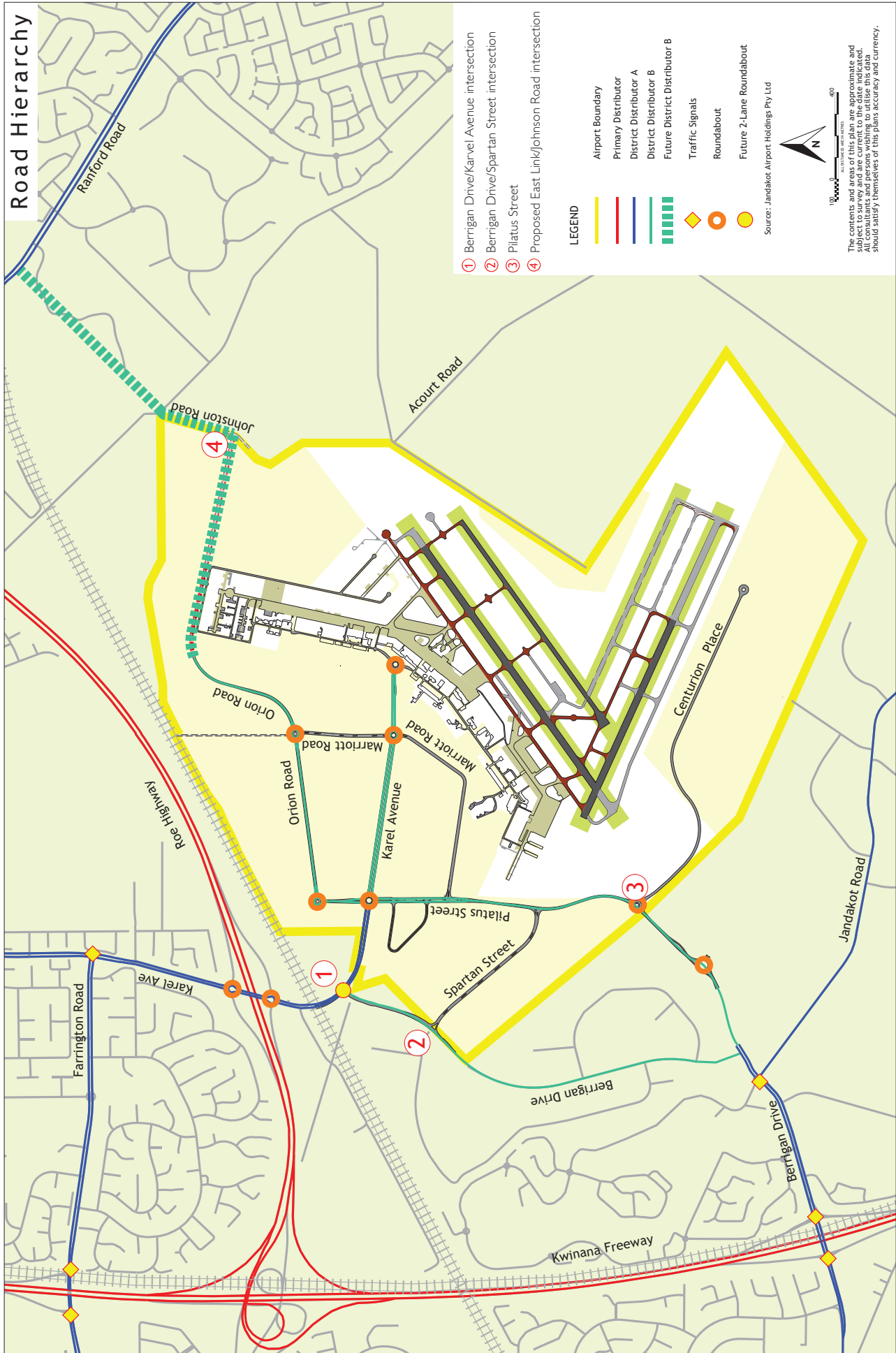
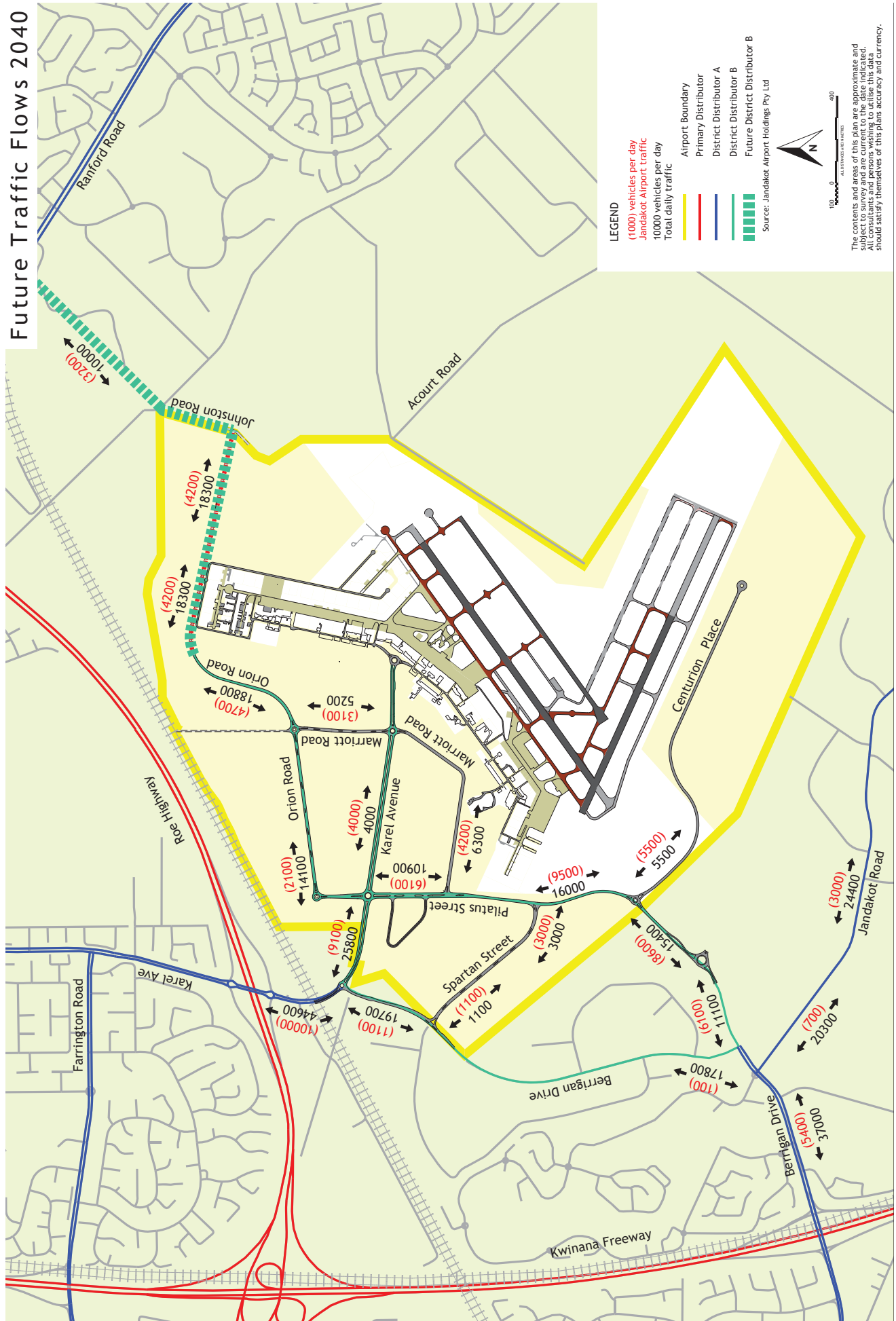


FIGURE 6.2 - FUTURE TRAFFIC FLOWS 2039



6.6.2 BERRIGAN DRIVE (NORTH) AND KAREL AVENUE INTERSECTION

It is proposed that ownership and responsibility for maintenance of this intersection will remain with the Local Government. Funding of the intersection upgrade has been agreed with the Local Government.

6.7 PUBLIC TRANSPORTATION

6.7.1 BUS SERVICE

Transperth commenced a public transport bus service into Jandakot Airport in February 2013 with regular weekday services linking the airport to Murdoch Station. As at June 2020 there were 8 daily services from Murdoch Station to the airport and 9 daily services from the airport to Murdoch Station (routes 515 & 516). Demand for the public bus services will be monitored by JAH in consultation with Transperth.

6.7.2 PASSENGER RAIL SERVICE

The State Government's METRONET policy includes the extension of the existing Thornlie passenger rail line to Cockburn Central as part of its Stage One projects a new station at Ranford Road near the northeast corner of the Jandakot Airport site. It is noted that this is now a committed project under construction.

6.7.3 PEDESTRIAN/ CYCLIST FACILITIES

The existing paths located at the perimeter of the site include the following:

- A principle shared path located on the north side of the Roe Highway reserve;
- A shared path located on the west side of Karel Avenue, along the bridge over the Roe Highway.
- North of the Roe Highway the path continues on the west side to up to Farrington Road. There is also a section of shared path on the east side of Karel Avenue south of the Dimond Court intersection; and
- A shared path located on the north side of Berrigan Drive (south of Jandakot Road).

Additional paths have been constructed as part of the ongoing development of Jandakot Airport which provide a significant and convenient network for pedestrians and cyclists including mid-block and intersection crossings. It is acknowledged that the Department of Transport has prepared the Long-Term Cycle Network, which identifies key routes that connect to and from Jandakot Airport.

6.8 CAR PARKING

The majority of existing building and hangar sites include car parking areas for staff and visitors. It is a JAH requirement that all developments provide adequate carpark facilities within the development site, based on car parking standards similar to City of Cockburn requirements. This practice has resulted in sufficient car parking being provided on the airport estate.

FIGURE 6.3 - FUTURE ROAD IMPROVEMENTS

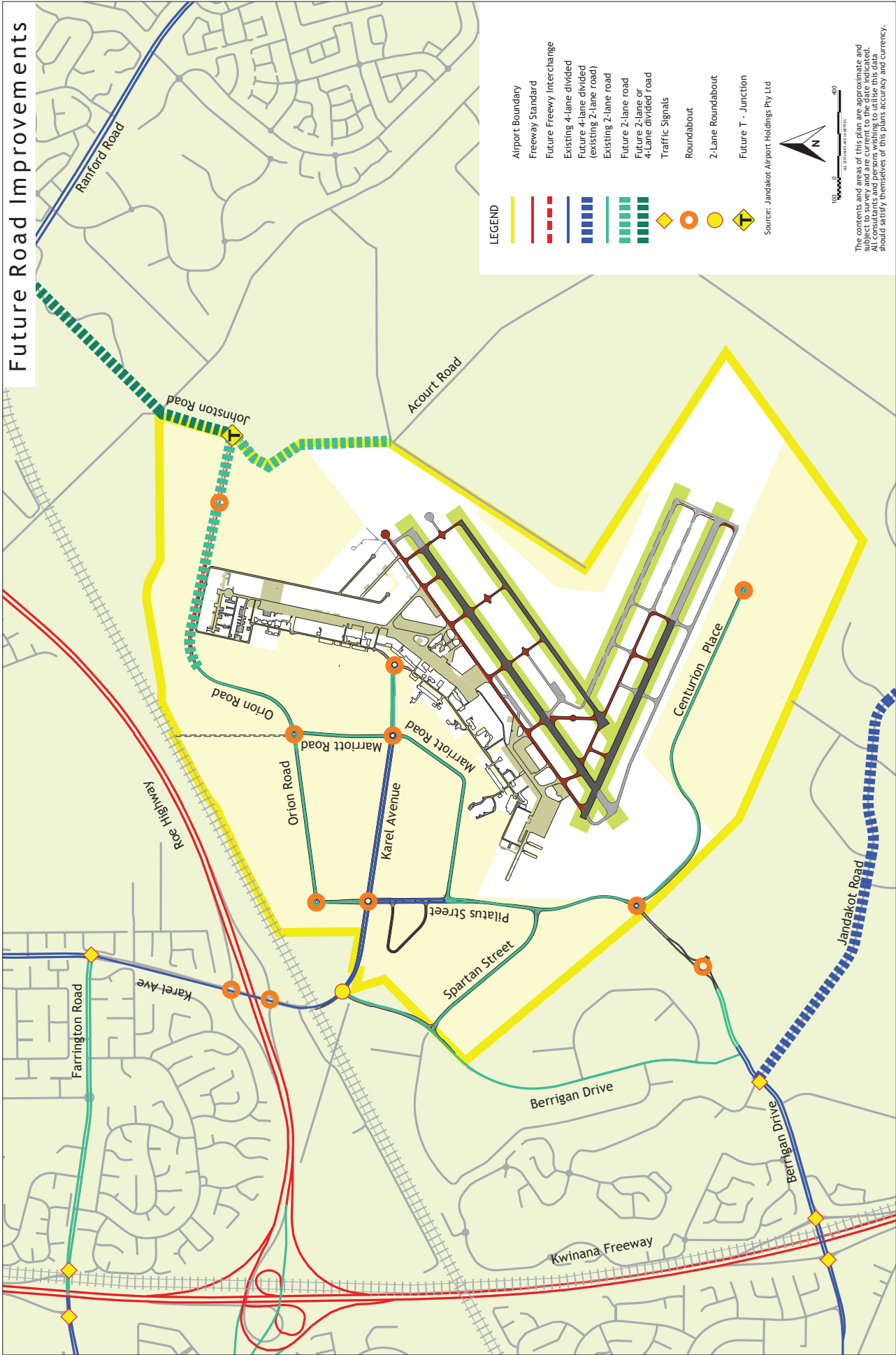
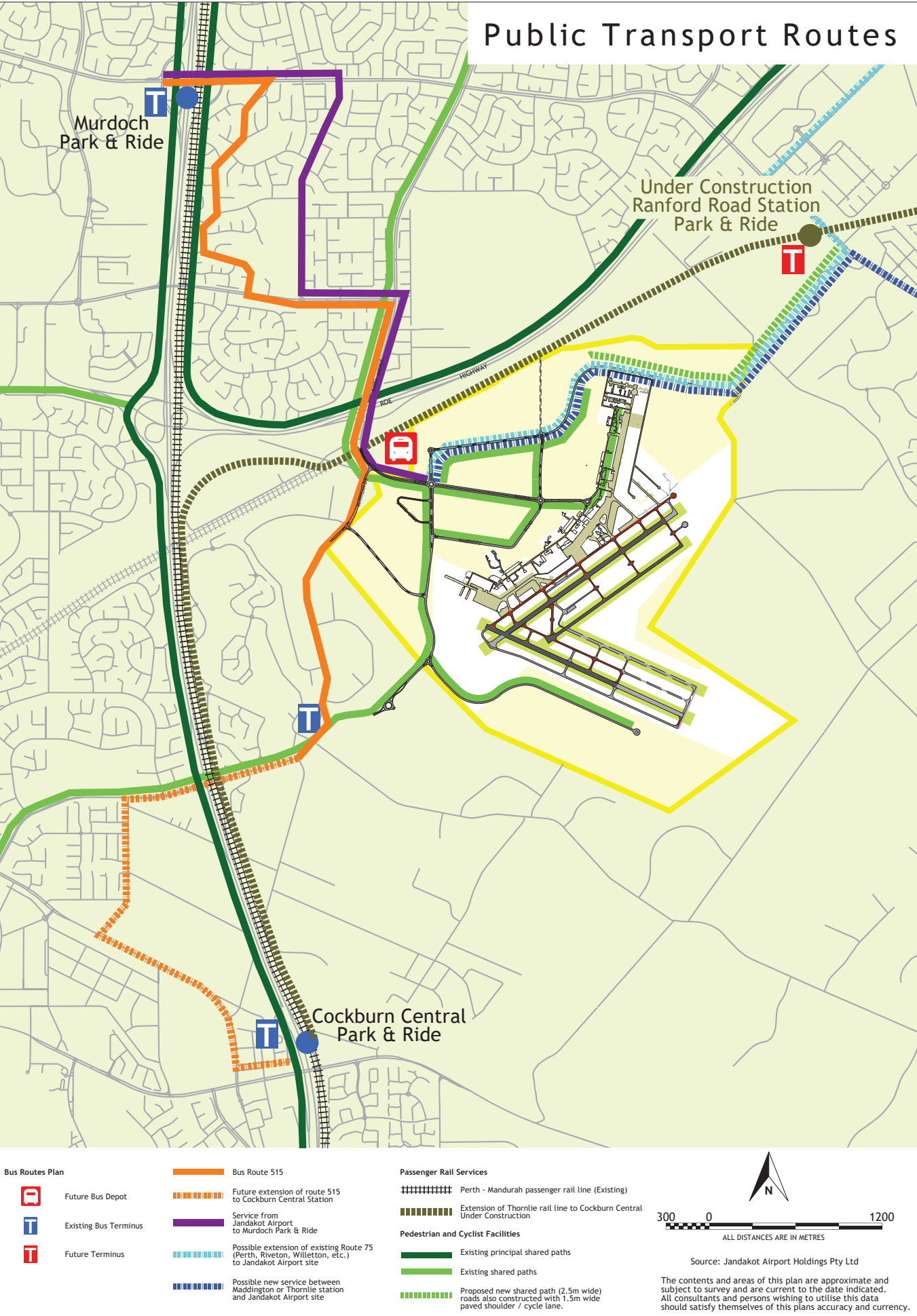


FIGURE 6.4 - PUBLIC TRANSPORT ROUTES



7. SERVICES INFRASTRUCTURE

JAH has invested significantly in the upgrading of services and infrastructure to meet the needs of aviation and non-aviation development at the airport. This investment totals approximately \$50 million in road, water, power, sewer and communications upgrades since the approval of the Master Plan 2005.

7.1 WATER SUPPLY SYSTEM

Jandakot Airport is currently serviced by two 150mm metered connections provided by Water Corporation, at the northern and southern boundaries of the airport. Both metered connections are fed directly into storage tanks fitted with booster pumps which are subsequently connected back into the internal main line. The booster pumps have been installed to maintain and regulate the internal mains reticulation pressure during peak demand periods and fluctuating Water Corporation service pressures/flows.

Existing fire hydrant services are compliant with Australian Standard 2419.1-2005.

7.2 SEWERAGE SYSTEM

Through the adoption of a Local Water Management Strategy, JAH remains committed to controlling domestic wastewater discharges and protecting groundwater resources.

The existing sewered portion of the airport is serviced by a reticulated sewerage network connected to a Type 40 Wastewater Pumping Station located on Marriott Road. Existing un-sewered leasehold sites manage wastewater disposal via septic tanks and aerobic treatment units.

The continued development of the sewerage system will ensure the progressive redundancy of existing wastewater systems in favour of a reticulated wastewater network where possible.

The sewer network runs to two underground wastewater pumping stations that are maintained by the Water Corporation. All wastewater is discharged offsite, via an underground pressure main. This main discharges into the Bibra Lake main sewer in Farmhouse Drive, Bibra Lake, a distance of approximately 3.5 kilometres.

Precincts 6 and 6A are serviced with a local precinct gravity sewer network which discharges into a precinct sewer pump station, located in the middle of Precinct 6.

This Precinct 6 pump station discharges via a pressure main into the existing gravity sewer on Pilatus Street which discharges into the existing Wastewater Pump Station.

7.3 DRAINAGE SYSTEM

A Local Water Management Strategy has been developed to ensure 'best practice' drainage principles are adopted and maintained across the airport.

As development increases so does the area of impermeable surfaces requiring drainage, infrastructure and management systems to cater for additional volumes of surface runoff.

Due to the high permeability of the underlying sandy soils, run-off is localised and short term as it generally infiltrates very quickly. Ponding rarely occurs and existing stormwater basins are only observed to hold water for short periods after sustained rainfall of high intensity, avoiding the creation of habitats that might otherwise attract water birds. As a result, 'at source' infiltration via soakwells and open drains/swales are the most efficient and sustainable means of drainage management.

Stormwater run-off from paved areas in existing older developed areas of the airport, including runways and taxiways is filtered through adjacent grassed areas. This is complemented by an underground pipe drainage network to prevent ponding over paved areas. The existing underground pipe network discharges to an open drain between the central and southern aprons, which directs flows to the basin at the north eastern end of the airport.

Drainage from wash bays is managed consistent with the Jandakot Airport Equipment and Washdown Policy, which requires appropriate treatment and disposal of water including the use of approved interceptors and/or separators. Similarly, stormwater drainage from fixed refuelling areas is captured and discharged via purpose built plate separators or interceptor pits.

Stormwater throughout the more recent developments (e.g. Precinct 5 and Precinct 6 outside of the JUWPCA) is managed via a combination of soakwells, open drains and swales complemented by an underground pipe drainage network. The soakwells, open drains and swales aim to maximise local groundwater recharge.

All lot developments maintain onsite attenuation of 1 in 20 year storm events without ponding through use of soakwells or small infiltration areas within their respective lots. Developments are also required to attenuate the 1:100 year/24hr average recurrence internal (ARI) storm event. Larger storm events discharge into road reserves and are directed to open drains/swales and/or drainage basins.

Management of stormwater in proposed developments will be consistent with the measures described above. The principle of 'at source' infiltration will further be promoted via all drainage pits having 'drops' and open bases. Stormwater discharge via the pipe network will be directed to nearby open drains/swales within road reserves, or nearby drainage basins (within 'trapped' drainage catchments).

For developments that overlay the JUWPCA, all stormwater collected from roof surfaces, with the exception of that which may be diverted to rainwater tanks, is discharged directly to soakwells within each lease boundary via downpipes in order to facilitate and maximise groundwater recharge. Stormwater from all roads, carparks and external hardstands within the JUWPCA will be discharged via piped drainage networks into drainage basins located outside of the JUWPCA boundary and sized to cater for the 1:100 year/24hr ARI storm event.

7.4 ELECTRICAL POWER SUPPLY

Electricity is supplied to the airport site through two feeders located on Karel Avenue. Since the approval of the Master Plan 2009, the power supply has been upgraded to 22KV high voltage supply.

The overall power demands for the future development of the airport will depend upon the land uses and intensity of development of these areas.

JAH provides and maintains a stand-by power supply by way of an emergency generator for essential services, including the Airservices Air Traffic Control Tower, runway and taxiway lighting, JAH administration and maintenance facilities, and the airside emergency access gate.

7.5 GAS SYSTEM

The airport includes a reticulated gas network along some road reserves. The main gas feed into the development is via the DNI60PE pipeline along Karel Avenue, which in turn is connected into the Westnet Energy high pressure main running along the northern side of the railway line that forms a portion of the northern boundary of the airport. The gas is converted from the high pressure to the reticulation pressures at the connection to the high pressure main.

If required, Precincts 6 and 6A, will be provided with a reticulated gas network through the road reserves constructed to service the future development of the area.

7.6 COMMUNICATION SYSTEMS

Telstra remains the governing authority for landline telecommunication services throughout the airport.

7.7 NAVIGATION INFRASTRUCTURE

JAH will work cooperatively with Airservices Australia to establish cable corridors between infrastructure on the airport to prevent future access and cable location issues. Early consultation is undertaken with Airservices for all proposed ducting work to address future requirements to consolidate or relocate cabling. This is outlined further in Section 8.8.

8. AIRPORT SAFEGUARDING

8.1 SAFEGUARDING FRAMEWORK

The National Airports Safeguarding Framework provides guidance on planning requirements for development that affects aviation operations. The Framework has been developed by the National Airports Safeguarding Advisory Group, which includes representatives from Commonwealth Infrastructure and Defence departments, aviation agencies; state and territory planning and transport departments, and the Australian Local Government Association. The framework consists of:

- Principles for National Airports Safeguarding Framework;
- Guideline A: Measures for Managing Impacts of Aircraft Noise;
- Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports;
- Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports;
- Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation;
- Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports;
- Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports;
- Guideline G: Protecting Aviation Facilities – Communication, Navigation and Surveillance (CNS);
- Guideline H: Protecting Strategically Important Helicopter Landing Sites; and
- Guideline I: Managing the Risk in Public Safety Areas at the ends of Runways.

8.2 AIRCRAFT NOISE

One of the most obvious impacts of airport operations on the surrounding community is aircraft noise. While the Jandakot Airport site was originally farmland, the close proximity of Jandakot to the Perth CBD and the rapid population growth in Perth has resulted in residential communities becoming established around the airport.

The *Airports Act 1996* requires that a master plan include an Australian Noise Exposure Forecast (ANEF) chart and the airport's plans for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels.

8.2.1 AIRCRAFT NOISE MODELLING

There are four types of noise chart indicators used in Australia:

- Australian Noise Exposure Index (ANEI), which depicts the actual noise exposure over a previous period of time, usually a year;
- Australian Noise Exposure Concept (ANEC), which is a planning tool used to test possible changes to noise exposure resulting from possible changes to airport operations;
- Australian Noise Exposure Forecast (ANEF), which is endorsed for technical accuracy by Airservices Australia and is the official land use planning reference. There can only be one ANEF in force at a particular time. Under the Act, Jandakot Airport's ANEF is required to be updated at least every eight years, in conjunction with the Master Plan update; and
- Noise Above Contour (N60/65/70) charts, which calculate the average daily noise events above 60, 65 or 70 decibels (dB(A)). The Noise Above Contours represent the frequency of the expected aircraft noise impact and provide a more readily understood measure of noise exposure for the general public.

The noise chart indicators are prepared using the US Federal Aviation Administration Aviation Environmental Design Tool (AEDT). The AEDT is the latest noise modelling tool, replacing the previous Integrated Noise Model (INM) that had been used worldwide since 1978. The software is continuously upgraded by the US Federal Aviation Administration as new aircraft or other factors are added to improve the accuracy of the exposure forecast.

The AEDT is a scientific measure that takes into account:

- Meteorological conditions at the airport;
- Forecast aircraft movement volume and frequency;
- Allocation of these movements to flight paths and distribution over the day and night time periods; and

- The noise signature (intensity, duration and tonal content) and performance characteristics of the specific aircraft types.

The time of day is also factored into the noise computation to allow for people being more sensitive to aircraft operations at night.

The ANEF and ANEI charts presented in this Master Plan were produced with AEDT Version 3b and SQL Server 2012. The INM version used at the time of the preparation of the previous ANEF, as included in Master Plan 2009, had a limited ability to model helicopter operations.

The N60, N65 and N70 noise contours were produced using AEDT.

8.2.2 AUSTRALIAN NOISE EXPOSURE FORECAST

For land use planning purposes in Australia, noise impact is illustrated using the ANEF system. An ANEF chart displays the predicted noise exposure levels for aircraft movements 20 years into the future.

The ANEF chart illustrates noise contours plotted at 20, 25, 30, 35 and 40 ANEF units. The contour plot is the calculated total noise energy at that given point on the ground on an annual average day. The higher the ANEF value, the greater the expected exposure to aircraft noise in that area.

The ANEF is referenced in Australian Standard AS2021-2015 'Acoustics - Aircraft Noise Intrusion – Building Siting and Construction' that provides land use planning and building treatment guidance in the vicinity of airports. Table 8.1 displays the restrictions that AS2021-2015 places on the types of new developments which can be built within various ANEF contours.

Table 8.1 Building Type Acceptability in ANEF Contours

Building Type	Acceptable	Conditional	Unacceptable
House, home, unit, flat, caravan park	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Hotel, motel, hostel	Less than 25 ANEF	25 to 30 ANEF	Greater than 30 ANEF
School, university	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Hospital, nursing home	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Public building	Less than 20 ANEF	20 to 30 ANEF	Greater than 30 ANEF
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

VALIDATION OF NOISE MODELLING

The *Airports Act 1996* requires the ANEF contours to be endorsed in a manner approved by the Minister for Infrastructure. Ministerial Direction M37/99, issued under the *Air Services Act 1995*, prescribes that Airservices Australia is responsible for the endorsement of ANEFs for all Australian airports. In deciding whether to endorse an ANEF, Airservices must be satisfied that:

- The appropriate selection of aircraft types for the airport has been used as input data;
- The runway usage and flight path data used as an input to the model are operationally suitable for the airport;
- The forecast numbers of aircraft movements, operating times and the aircraft types carrying out operations are not greater than the physical ultimate capacity of the existing or proposed runway/s using accepted and published methodologies;
- The contours have been modelled correctly; and
- The proponent has demonstrated it has paid due regard to all issues raised by State and Local Government authorities in relation to the ANEF.

ULTIMATE CAPACITY ANEF

An Ultimate Capacity ANEF has been prepared to represent an average day when the airport reaches its maximum aircraft operating capacity (described in Section 4.2). The Ultimate Capacity ANEF was endorsed by Airservices for technical accuracy on 12 March 2021 and is shown at Figure 8.1

Noise levels over particular periods vary due to prevailing winds, traffic demand and times of operation. The aircraft mix at Jandakot Airport includes a large range of aging aircraft types. It is realistic to assume that the older aircraft types will be replaced within the next 20 years, but it is impossible to know what aircraft types they will be replaced with. However, as newer aircraft types are generally much quieter than the older aircraft types, the ANEF calculation using the noise footprints of the current older fleet means that the ANEF presents a worse-case scenario.

Australian Standard 2021-2015 Appendix A states that the actual location of the 20 ANEF contour is difficult to define accurately because of variations in aircraft flight paths, pilot operating techniques and the effect of meteorological and terrain conditions on noise propagation. For that reason, the 20 ANEF contour is shown as a broken line on ANEF plans.

The NASF Alternative Aircraft Noise Metrics paper provided as Attachment 1 to the NASF Guideline A: Measures for Managing Impacts of Aircraft Noise, also acknowledges that while populations with the highest aircraft noise exposure often live within the 20 ANEF contour, the majority of noise complaints received are coming from residents living outside the 20 ANEF contour.

8.2.3 COMPARISON BETWEEN THE ANEF 2035 AND ULTIMATE CAPACITY ANEF

The Ultimate Capacity ANEF shows an overall noise footprint of 1601 hectares of land, which is a 7% increase from the ANEF 2034/35 prepared for Master Plan 2014, and is shown in Figure 8.2. The proportion of total land area outside of the airport boundary affected by the ANEF has increased slightly, from 62.8% in ANEF 2034/35 to 65% in the Ultimate ANEF.

The main changes from the 2034/35 ANEF are:

- The ultimate operational capacity of the airport has been reassessed. Due mainly to the impact of the Class D Airspace procedures introduced in 2010, which has reduced the number of aircraft permitted in the circuit area, the theoretical capacity of Jandakot Airport operations has been recalculated to be 460,000 fixed-wing movements and 66,000 helicopter movements per annum, as discussed in Section 4.3. This is a reduction of 54,650 fixed-wing and 10,000 rotary-wing movements per annum from the previous ANEF assessment;
- Inclusion of a new Standard Instrument Departure (SID) track to the southwest that was implemented by Airservices Australia in 2015; and
- There have been some changes made to the forecast aircraft types following feedback from the airport operators. However, the projected types of operations and allocation of runway use associated with the ultimate airfield layout have not changed from the ANEF 2029/30.

8.2.4 AREAS ABOVE SIGNIFICANT ANEF LEVELS

Section 71 of the *Airports Act 1996* requires JAH, as the airport-lessee company, to develop plans for managing aircraft noise intrusion in areas above significant ANEF levels (above 30 ANEF) in consultation with operators and local government bodies in vicinity of the airport. These noise management arrangements are detailed in Section 8.3.

There is a total of 287 hectares of land within the new Ultimate Capacity ANEF 30 Contour, with over 86% of this land area contained within the airport boundary. There is no material difference in the off-airport land areas within the 30 Contours of the Ultimate ANEF, 2029/30 ANEF and ANEF 2012/13. The two small areas where the Ultimate ANEF 30 Contour extends beyond the airport boundary are to the southwest and east as shown in Figure 8.1.

The area to the southwest (towards Jandakot Road) is within an area zoned 'Resource' under the City of Cockburn Town Planning Scheme No. 3 and 'Rural – Water Protection' under the Metropolitan Region Scheme. This area is currently being used to manufacture paving and landscaping products. The objective of the 'Resource' zone as stated in the City of Cockburn Town Planning Scheme No. 3 is "to provide for the protection

of the Perth Metropolitan underground water resource in accordance with the requirements of Statement of Planning Policy No. 6 published by the Western Australian Planning Commission on 12 June 1996”.

The area to the east is within both the City of Cockburn (south of Acourt Road) and the City of Canning (north of Acourt Road). The affected area within the City of Canning boundary is reserved 'Parks and Recreation' under the Town Planning Scheme No. 40. It is also zoned 'Rural – Water Protection' and reserved 'Public Purposes: Special Use' under the Metropolitan Region Scheme. This area is/has been used for sand mining. The affected area within the City of Cockburn boundary is zoned 'Resource' under the City of Cockburn Town Planning Scheme No. 3 and 'Rural – Water Protection' under the Metropolitan Region Scheme. This area is a residential housing estate called Acourt Retreat that consists of 30 blocks, each approximately 2 hectares in size, approved for development in 2009. The ANEF incorporated in State Planning Policy 5.3 at the time of the Acourt Retreat development approval was ANEF 2025 (from Master Plan 2005), which showed the 30 ANEF contour running through the 11 westernmost blocks adjoining Johnston Road at the boundary of the airport. The Ultimate Capacity ANEF 30 Contour has moved slightly to the east compared to ANEF 2034/2035, resulting in six existing houses being affected by the new Ultimate Capacity ANEF 30 Contour.

8.2.5 AUSTRALIAN NOISE EXPOSURE INDEX

The Australian Noise Exposure Index (ANEI) contour map displays the estimated daily noise levels for actual movements over a 12 month period. The ANEI for Jandakot Airport is shown in Figure 8.3 and is based on the aircraft movements that occurred during the period 01 May 2012 to 30 April 2013.

Similar to the ANEF, the main changes between ANEI 2006 and ANEI 2012/2013 are largely as a result of the changes to the INM software modelling of helicopter operations. Financial year 2005/2006 was the busiest year on record for Jandakot Airport, resulting in the ANEI 2006 calculation representing daily noise exposure for a total of 406,147 annual aircraft movements. The ANEI 2012/2013 has a much lower movement volume of 252,106 annual aircraft movements, made up of 218,959 fixed-wing and 33,147 helicopter movements. Touch-and-go training circuits comprise 61% of the fixed-wing movements and 68% of the helicopter movements.

There are no major changes between the flight tracks used for ANEI 2012/13 and current NFPMS flight tracks that would cause any differences to the ANEI contours and therefore ANEI 2012/2013 is considered to be still relevant in illustrating current noise impacts.

8.2.6 NOISE ABOVE CONTOURS

The NASF 'Guideline A: Measures for Managing Impacts of Aircraft Noise' acknowledges that the ANEF 20 and ANEF 25 zones do not capture all high noise affected areas around an airport and that Australian Standard AS2021 recognises that the ANEF contours are not necessarily an indicator of the full spread of noise impacts, particularly for residents newly exposed to aircraft noise.

The NASF was developed through the National Airports Safeguarding Advisory Group, which has recommended a review of Australian Standard AS2021 to consider inclusion of daily noise event criteria when considering zoning for noise-sensitive developments.

This noise metric is a frequency based measure of aircraft noise to present the projected number of aircraft noise events on an average day that are above a specific noise level, shown as a N70, N65 or N60 Contour chart.

The N70 Contours display the calculated average daily aircraft noise events above 70 decibels (dB(A)). A 70 decibel outside noise corresponds to a 60 decibel noise event indoors, which is the noise level specified in Australian Standard AS2021 as the indoor design sound level for normal domestic areas in dwellings that may interfere with activities such as normal conversation and watching television.

The N60 Contours display the calculated average daily aircraft noise events above 60 decibels. A 60 decibel outside noise corresponds to a 50 decibel noise event indoors, which is specified in Australian Standard AS2021 as the sleep disturbance level.

NASF Guideline A recommends that zoning for noise-sensitive development be avoided where noise modelling for the airport indicates either :

- 20 or more daily events greater than 70 dB(A);
- 50 or more daily events of greater than 65 dB(A); or
- 100 events or more daily events of greater than 60 dB(A).

In addition, Guideline A suggests that measures for aircraft noise amelioration and restriction on noise sensitive development would be appropriate where there are more than 6 events predicted between the hours of 11pm to 6am which create a 60 dB(A) or greater noise impact.

The N60, N65 and N70 contours charts shown in Figures 8.4, 8.5 and 8.6 have been calculated using the ANEF ultimate capacity data, which is when Jandakot Airport will be operating at the maximum number of aircraft movements. Contours are shown in intervals from 10 average daily events up through to 700+ average daily events.

It is important to note that the Noise Above charts show the average daily noise events, calculated by dividing the total annual events by 365. For comparison purposes, N60 contours have also been prepared for a Busy Day. The N60 Busy Day diagram, included as Figure 8.7, depicts the projected amount of noise events for a day where the airport will be operating at its peak daily movement level (i.e. extremely favourable weather conditions for flying training).

8.2.7 FLIGHT PATHS

The *Airports Act 1996* requires illustration of flight paths used to prepare the ANEF, ANEI and Noise Above Contours.

The flight paths used for the noise modelling present, as accurately as possible, the most frequently used flight tracks for current and future aircraft operations. The positioning and spread of these flight paths was determined through a comparison of the current published flight procedures and the highest density tracks identified in Airservices supplied Noise and Flight Path Monitoring System radar data, and then confirmed by local Air Traffic Control personnel as being representative of the current and expected future operations.

While illustration of set flight tracks is required for noise modelling, the actual flight tracks flown can vary substantially between aircraft. The majority of operations at Jandakot Airport are conducted under Visual Flight Rule conditions, whereby the pilots use visual landmarks to determine the flight path. The actual flight track flown is therefore affected by, but not limited to, factors such as the pilot's familiarity with the area, aircraft performance,

air traffic management requirements, and meteorological conditions. Although the term 'flight path' is commonly used and the tracks are shown as thin straight lines on maps, in reality an aircraft's flight path occupies a three-dimensional region of space or set area and the resulting flight corridor can be a few kilometres wide.

Class D Airspace procedures allow aircraft to enter and leave the Jandakot Control Zone from any direction. However, due to the large volume of traffic at Jandakot Airport, Jandakot ATC requires aircraft to track via specific entry and exit points so that aircraft segregation and clearances can be appropriately managed by the Air Traffic Controllers. The depicted flight tracks show only the path to and from the specific entry and exit points due to aircraft being able to approach and depart the specific entry/exit points in and from any direction.

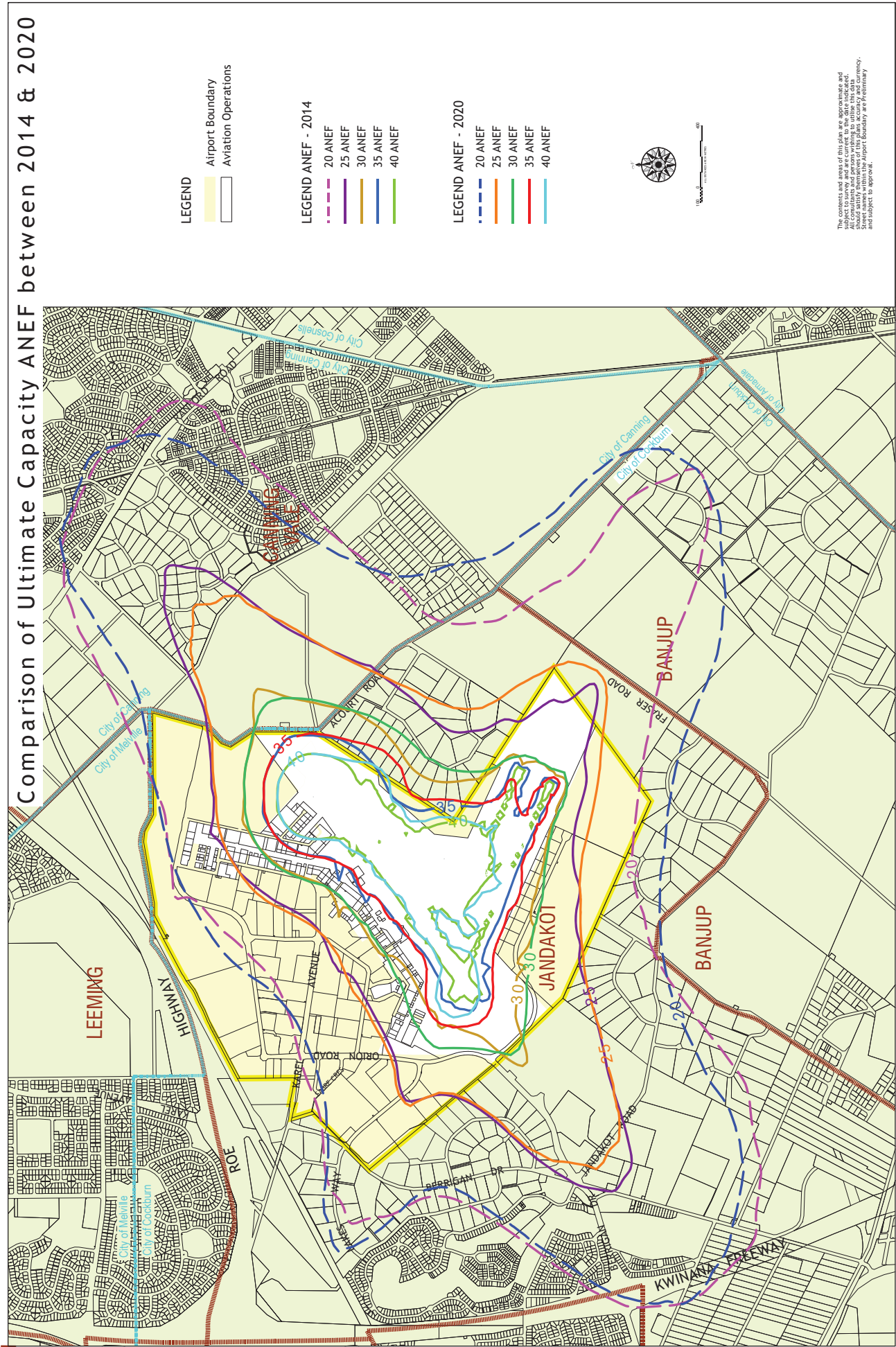
Potential relocation of the NDB (see section 4.8.2) will require reassessment of the two instrument procedures designed for NDB equipment. The NDB-B path from the north is used the majority of the time. The NDB-A path from the south is not frequently utilised. A comparison of the approaches between the current NDB and proposed NDB location show a degree of change less than 5% as the aircraft approaches to join the nominated circuit track. Therefore, the existing NDB flight tracks have not been amended for ANEF modelling purposes. It is noted that new aircraft are being fitted with GPS equipment that cannot interrogate an NDB, and the use of the NDB has a limited life span.

There are no changes to the existing published Visual Flight Rules routes or visual waypoints expected as a result of the implementation of this Master Plan.

Figures 8.8 – 8.15 show the anticipated flight paths used to calculate the ANEF.

Currently circuits on runway 12/30 are conducted to the south of the runway in either direction. When the parallel fourth runway is built (runway 12L/30R), circuits will then be conducted to the north of the runway with arrivals and departures occurring on the original runway 12R/30L. The parallel configuration will allow an increase in the number of circuits to be conducted on runway 12L/30R.

FIGURE 8.2 - COMPARISON OF ULTIMATE CAPACITY ANEF BETWEEN 2014 & 2019



8.3 AIRCRAFT NOISE MANAGEMENT

Aircraft noise management is the responsibility of the entire aviation industry.

COMMONWEALTH GOVERNMENT

The Australian Government is responsible for overall policy and legislation. The Department of Infrastructure, Transport, Regional Development and Communications advises the Government on the policy and framework for Australian airports and the aviation industry, manages the administration of the Government's interests in privatised airports under the *Airports Act 1996*, and provides policy advice to the Minister on the efficient management of Australian airspace and on aircraft noise and emissions.

STATE & LOCAL GOVERNMENTS

State and Local Governments are responsible for managing land-use planning around airports. State Planning Policy No. 5.3 - Jandakot Airport Vicinity and Draft SPP 5.3 (see Section 2.3.7) have been developed to protect Jandakot Airport from encroachment by incompatible land use and development, so as to provide for its ongoing, safe, and efficient operation, and to minimise the impact of airport operations on existing and future communities with particular reference to aircraft noise.

CIVIL AVIATION SAFETY AUTHORITY

The Civil Aviation Safety Authority is responsible for the safety regulation of civil air activities within Australia.

This includes airspace regulatory functions such as setting flight path heights and distances, monitoring standards for holders of Air Operators Certificates and licenses, and assessing and approving changes to Australian airspace architecture.

AIRSERVICES AUSTRALIA

Airservices Australia is a government-owned corporation that is responsible for airspace management, aviation communications, radio navigation aids, aviation rescue and firefighting services, and aeronautical information.

Airservices manages complaints and enquiries about aircraft noise and operations through its Noise Complaints and Information Service. This service is the Australian aviation industry's main interface for the community on aircraft noise and related issues. Complaints and enquiries help identify issues of

community concern and opportunities for delivering better noise outcomes for communities. Analysis of complaints and enquiries is used to identify systemic problems, provide guidance for government departments in developing aviation policy and provide other aviation agencies (such as the Civil Aviation Safety Authority) and industry bodies (such as airports) with information on community concerns.

Airservices Australia and the Australian Airports Association have established an aircraft noise website, www.aircraftnoise.com.au, to provide information on the causes of aircraft noise, how the aviation industry is working together to manage aircraft noise, and what people can do to reduce its impact.

AIRCRAFT NOISE OMBUDSMAN

The Aircraft Noise Ombudsman conducts independent administrative reviews of Airservices Australia's management of aircraft noise-related activities, including the handling of complaints or enquiries made to Airservices about aircraft noise, community consultation processes related to aircraft noise, and the presentation and distribution of aircraft noise-related information.

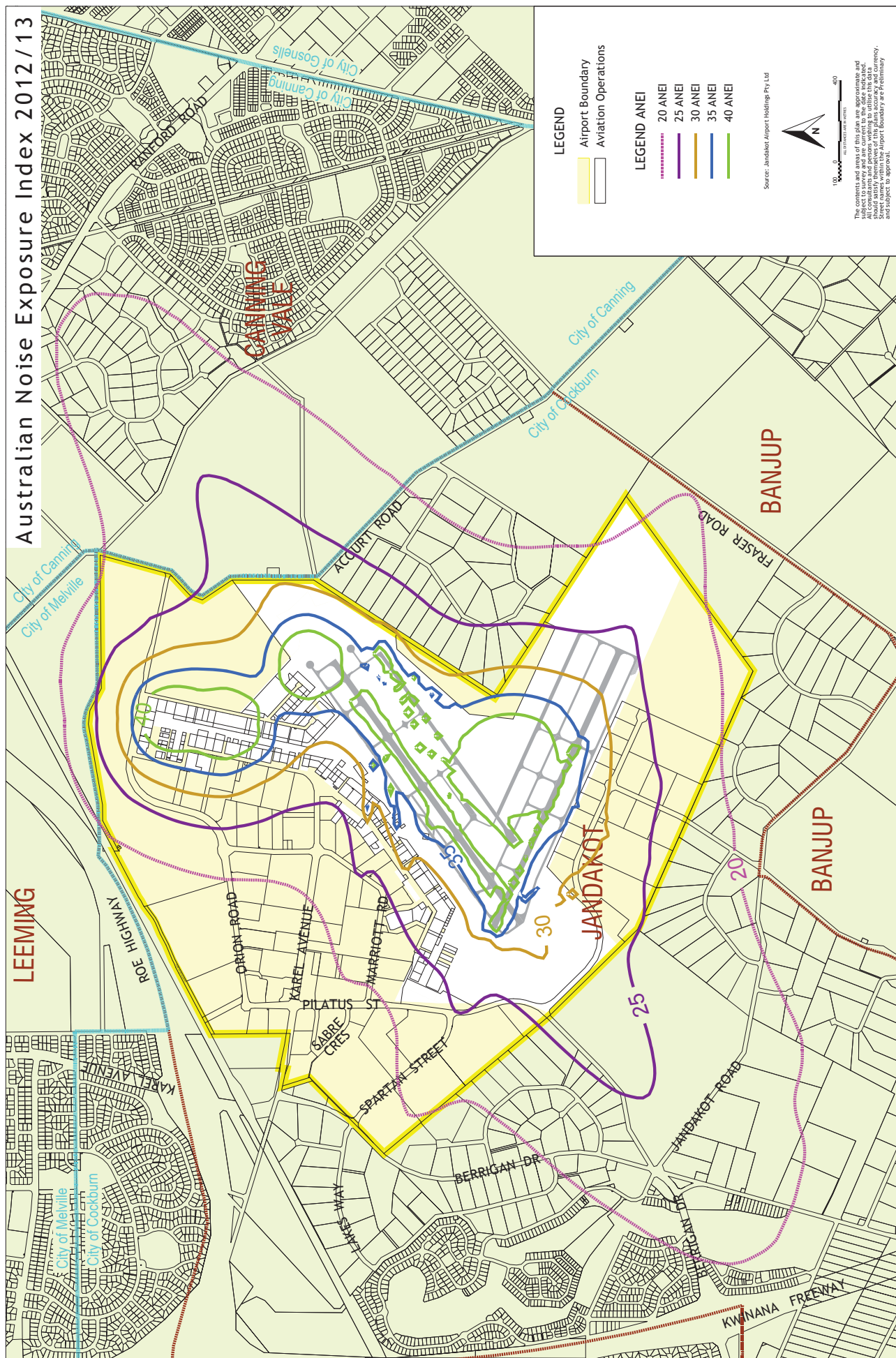
JANDAKOT AIRPORT HOLDINGS

Jandakot Airport only has direct control over the management of ground-based aircraft noise. Aircraft engines need to be tested during and/or following engine maintenance so that engineers can verify that the engines are working properly. The majority of aircraft based at Jandakot Airport have piston-engines which are also required to be tested by pilots prior to every flight. These pre-flight run-ups are only permitted in the designated run-up bays or in locations where the wind or distance helps minimise the carriage of noise off airport.

AIRCRAFT OPERATORS

Regardless of size, purpose or ownership, all civil aircraft operating in Australia must comply with the *Air Navigation (Aircraft Noise) Regulations 2018*, Administered by the Department of Infrastructure, Transport, Regional Development and Communications. Aircraft operators are required to obtain an Aircraft Noise Certificate, which must be reassessed if the aircraft is modified in any way which may affect its noise characteristics. Aircraft operators are also responsible for ensuring that noise abatement principles are adhered to.

FIGURE 8.3 - AUSTRALIAN NOISE EXPOSURE INDEX



PUBLICATION AND GUIDES

Noise abatement procedures for Jandakot and other Australian airports are published in En-Route Supplement Australia. The aerodrome information depicted in this publication is compiled and provided by Airservices and the airport operator for use by pilots and operators intending to operate aircraft at or in the vicinity of the aerodrome.

The Civil Aviation Safety Authority produces the Jandakot Airport Visual Pilot Guide. This guide, which is available from the CASA website, provides information about flight paths, noise abatement and operating procedures for pilots flying in and out of Jandakot Airport.

FLY NEIGHBOURLY

Fly Neighbourly is a voluntary code of conduct for pilots that was introduced at Jandakot Airport in January 2000. While it is impossible to stop aircraft noise emanating from an airport, Fly Neighbourly recognises that there are opportunities to reduce the effect of aircraft noise on surrounding communities.

The Fly Neighbourly programme focuses on pilot education, targeted through the co-operation of major operators, the use of signage and the inclusion of the Fly Neighbourly principles in the En-Route Supplement Australia pilot guide and the Jandakot Airport Conditions of Access & Use. Pilots are expected to undertake operations in a manner which is considerate of local residents. However, safety is the primary concern of air navigation and operations, and implementation of the Fly Neighbourly principles is therefore subject to safety and operational considerations as air traffic procedures and instructions must be complied with at all times.

The Fly Neighbourly principles are amended from time to time in consultation with local operators. In 2010, the circuit training hours were further restricted for operations on a Saturday. Training procedures were changed in March 2013 following a review of simulated engine failure practices, and in December 2013 aerobatic operations were introduced into Fly Neighbourly following consultation with Airservices Australia and the Aircraft Noise Ombudsman's office. In early 2014 a workshop was held with local operators and representatives from Airservices, JAH and the Aircraft Noise Ombudsman's office to review the Fly Neighbourly principles and provide more detailed information to local communities about what is being done to minimise the impact of aircraft noise.

The revised Fly Neighbourly principles are detailed below. Information about Fly Neighbourly, including additional descriptions of the Fly Neighbourly statements, is available on the Jandakot Airport website.

Operators at Jandakot Airport will:

1. Comply with noise abatement procedures included in the Air Navigation Regulations, Departure Approach Procedures (DAP) and En-Route Supplement Australia (ERSA) guide, irrespective of Air Traffic Control Tower hours of operation.
2. Ensure that environmental awareness and noise management is included in pilot familiarisation and training.

Subject to Air Traffic Control and safety requirements, pilots will endeavour to:

GROUND OPERATIONS

3. Avoid lengthy engine run-ups and conduct non-pre-flight engine run-ups in designated areas or in locations where the wind or distance helps minimise the carriage of noise off airport.
4. Where practicable, small jet aircraft should be towed for start-up to a location that avoids causing jet-blast damage.

DEPARTURE

5. Use sufficient runway length and best rates of climb to maximise height over populated areas. High performance and twin-engine aircraft are to conduct full length take-offs where possible.
6. Minimise noise after take-off by reducing engine revs as much as possible.

IN FLIGHT

7. Maintain the published or Air Traffic Control cleared tracks after take-off. Where practicable, all instrument flight rule aircraft are to depart via the appropriate standard instrument departure.
8. Maintain required altitudes, particularly over residential housing. As much as possible, avoid flying over residential areas, hospitals and schools and maximise the use of flight paths over less densely populated areas such as water, forest and highways.

FIGURE 8.4 - N60 CONTOURS

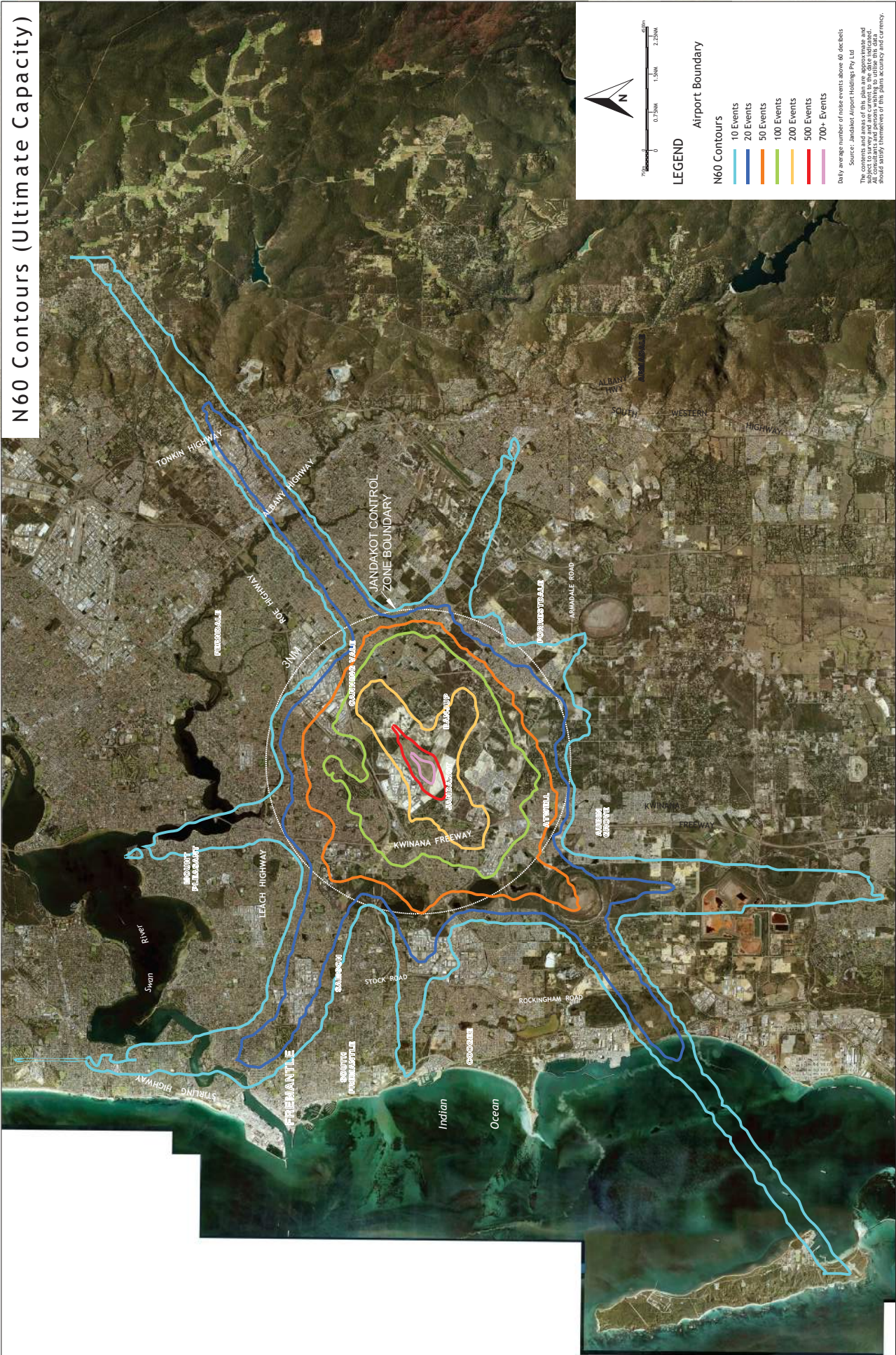


FIGURE 8.5 - N65 CONTOURS

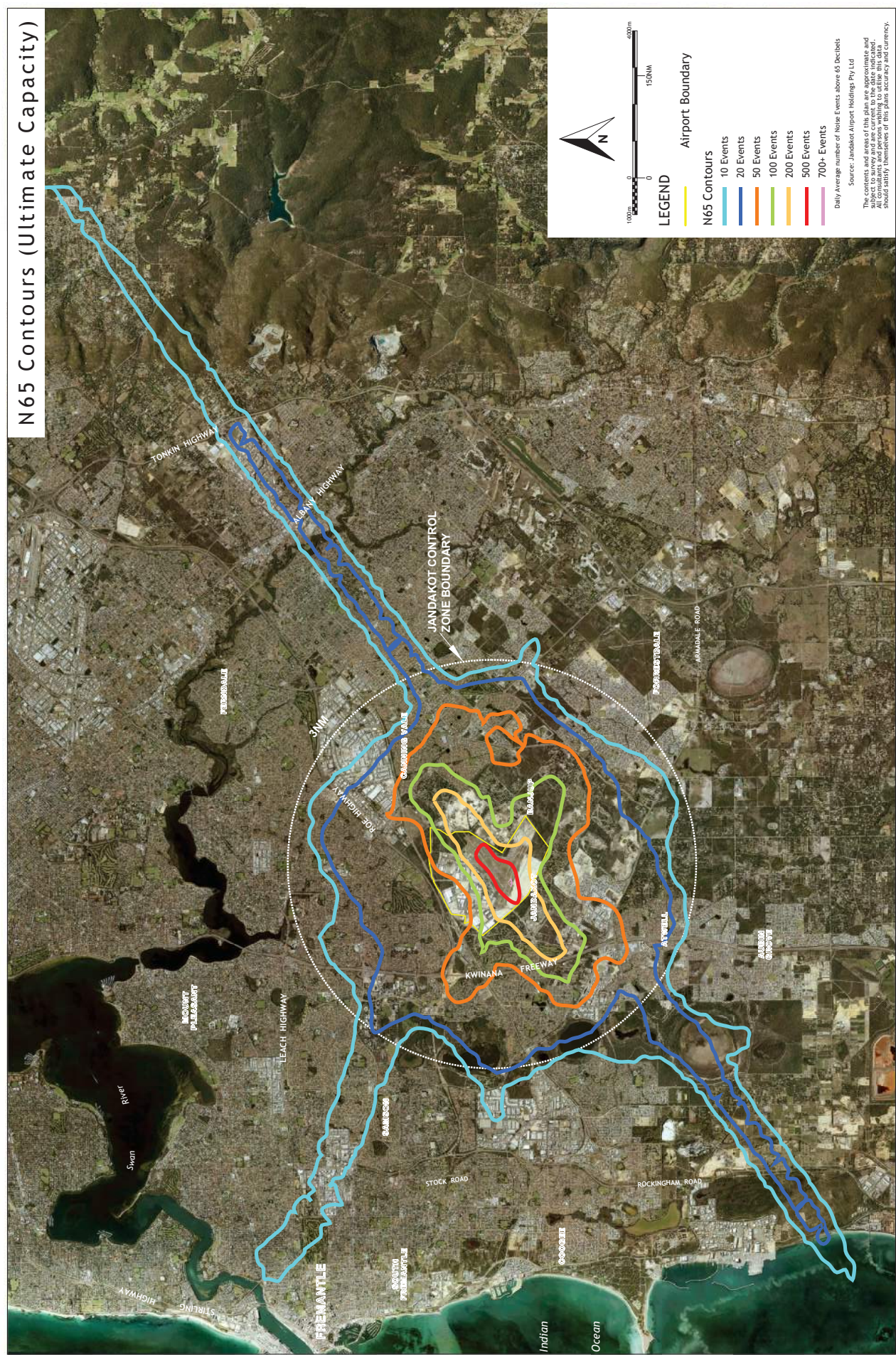


FIGURE 8.6 - N70 CONTOURS

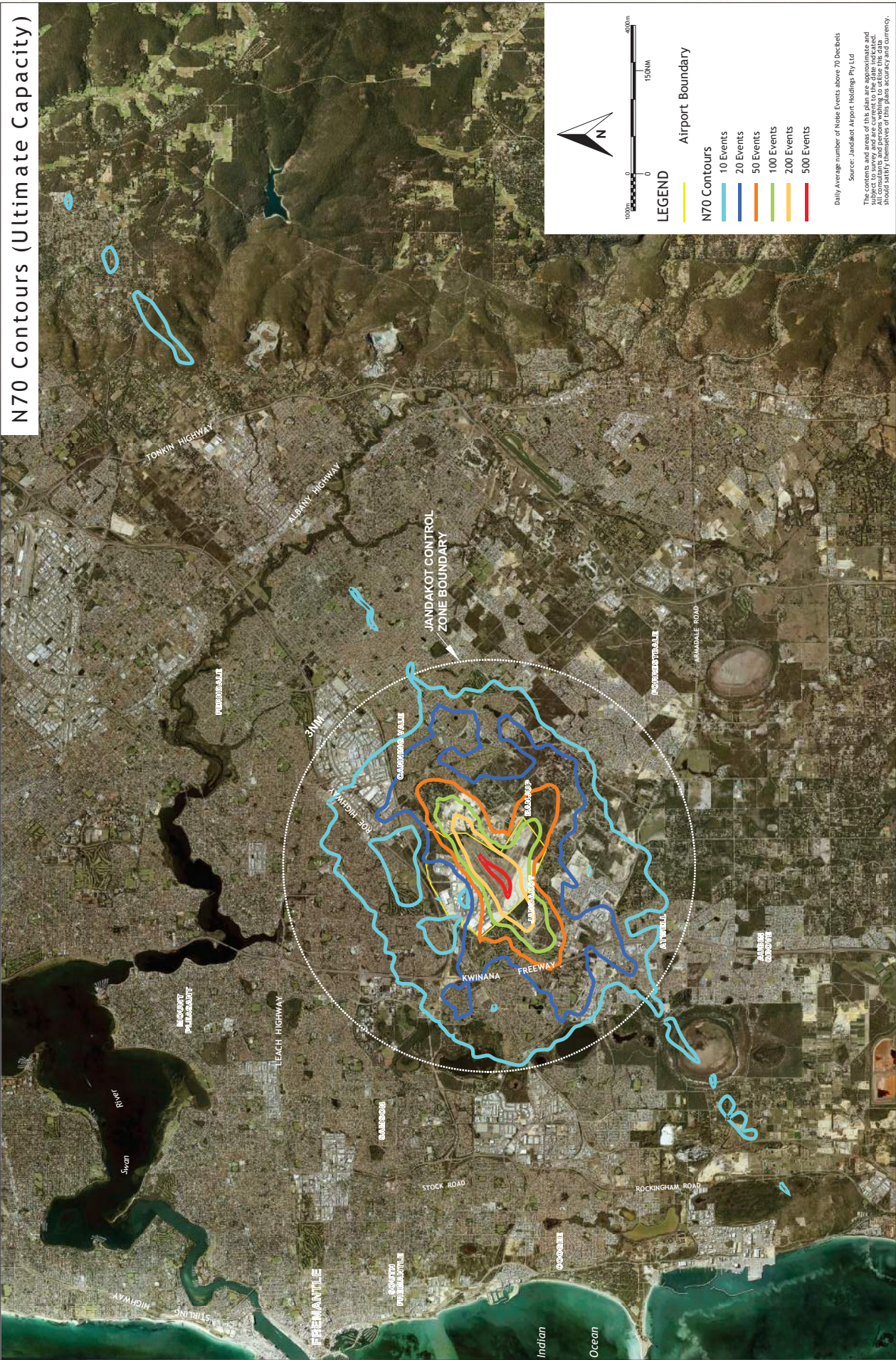
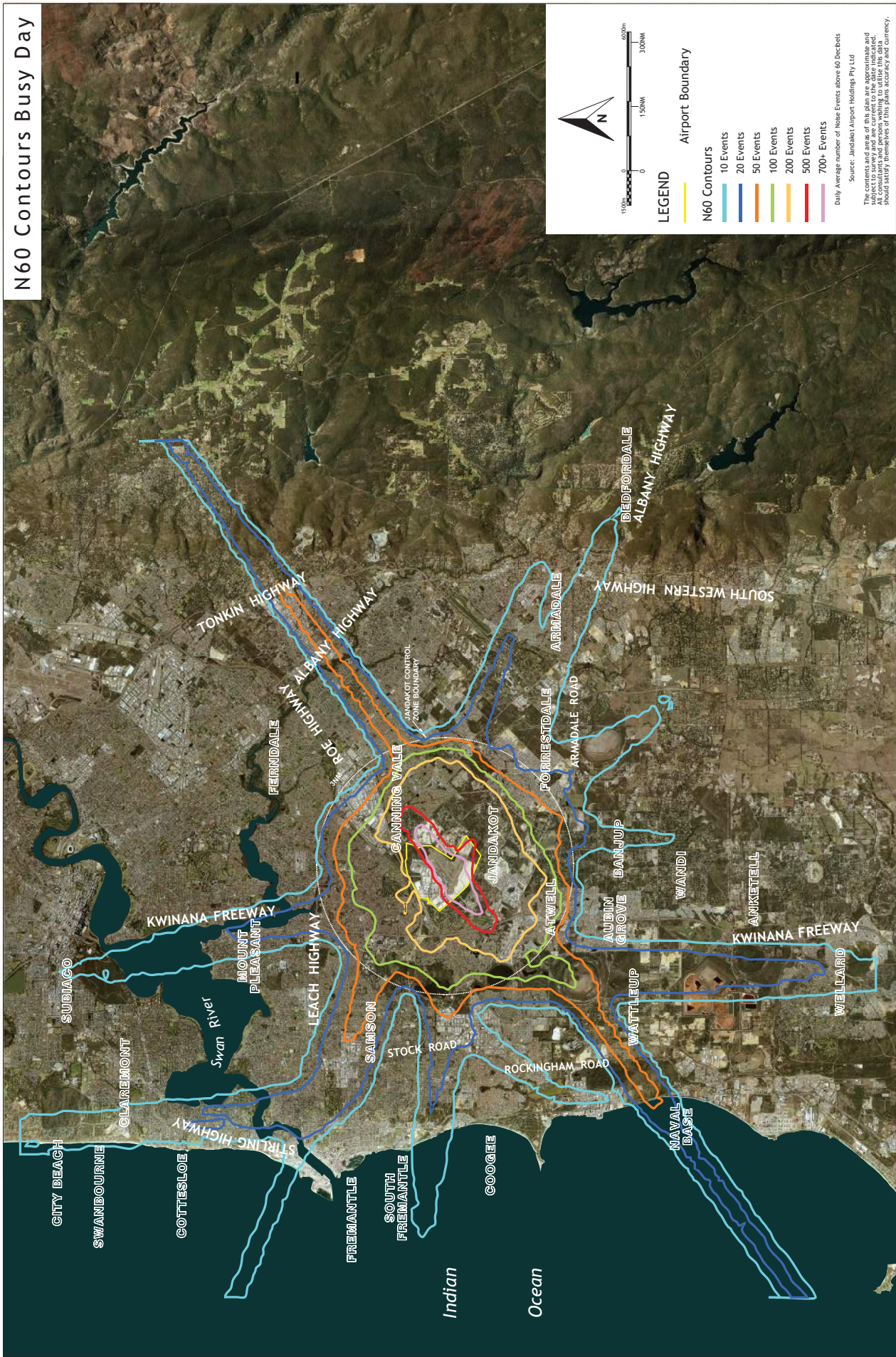


FIGURE 8.7 - N60 CONTOURS (BUSY DAY)



CIRCUIT TRAINING

9. Only conduct 'Touch & Go' circuit training between 0700-2230 Monday to Friday, and 0800-1800 Saturday and Sunday.
10. Fly circuits and conduct turns that minimise impact on residential areas.

SIMULATED ENGINE FAILURE

11. Fixed wing aircraft must conduct simulated engine failures over the runway with recovery initiated prior to the airside boundary.

AEROBATICS

12. Perform aerobatics at least 600m laterally seaward off the coastline or away from residential areas when over land.

TRAINING AREA

13. When operating to, from and within the Training Area (DI04), avoid populated areas where possible. After leaving Jandakot Class D Airspace, climb to the highest practicable level below the base of controlled airspace.

HELICOPTERS

14. Use correct take-off and landing areas to minimise the effects of rotor wash.
15. Minimise tight manoeuvres and turns, and avoid hovering, when operating over populated areas where possible.
16. Minimise rotor blade slap noise and utilise descent profiles with low-power and low-noise operations.

8.3.1 JANDAKOT AIRPORT COMMUNITY AVIATION CONSULTATION GROUP

The Jandakot Airport Community Aviation Consultation Group (CACG) is an independently chaired committee established to provide a forum for appropriate community engagement on airport planning and operations. The Jandakot Airport CACG comprises representatives from Federal, State and Local Governments, Airservices Australia, Jandakot Airport Holdings, aircraft operators, and local community groups.

The role and purpose of the CACG is to enable residents affected by airport operations, JAH, aviation operators at the airport, local authorities, airport users, and other interested parties, to exchange information on issues relating to the operation of Jandakot Airport

and its impacts. The CACG meets on a quarterly basis and minutes of the meetings are published on the Jandakot Airport website.

8.3.2 NOISE INFORMATION

Experience suggests that those people who are aware of aircraft noise before they move to an area tend to have a higher tolerance than those who were unaware that an airport is nearby. Providing information on aircraft noise impacts and aircraft operating procedures to the surrounding community has proven to be an effective tool in the management of aircraft noise issues.

The Jandakot Airport website was upgraded in March 2013, and the Aircraft Noise webpage was significantly amended to provide detailed information and related links on topics such as aircraft noise impacts, aircraft noise modelling, which organisations are responsible for managing aircraft noise, what is being done, and what affected residents can do.

8.3.3 AIRSPACE ARCHITECTURE AND REDESIGNED NAVIGATION PROCEDURES

Under the *Airspace Act 2007* and in respect of the *Airspace Regulations 2007*, Australia's airspace regulator (CASA) is the final decision maker with regard to any changes to the airspace architecture and/or redesigned navigation procedures which may be required in respect of supporting lengthening of any runway.

8.4 AIRSPACE PROTECTION

8.4.1 PRESCRIBED AIRSPACE

The Department of Infrastructure, Transport, Regional Development and Communications protects the airspace around leased Federal airports under the *Airports Act 1996* and the *Airports (Protection of Airspace) Regulations 1996*. Obstructions and obstacles in the vicinity of an airport have the potential to create air safety hazards and to seriously limit the scope of current and future aviation operations into and out of an airport. Whilst the protection of airspace is applied to all stages of flight, it is most critical for arrivals and departures at any airport. During these stages, the aircraft is close to the ground, the pilot's workload is greatest and the aircraft is least manoeuvrable. Since the majority of aircraft accidents occur during these stages, the objective is to provide a safe, predictable environment in which aircraft can land and take-off.

FIGURE 8.8 - INDICATIVE 2039 ANEF FLIGHT PATHS RUNWAY 06 DAY

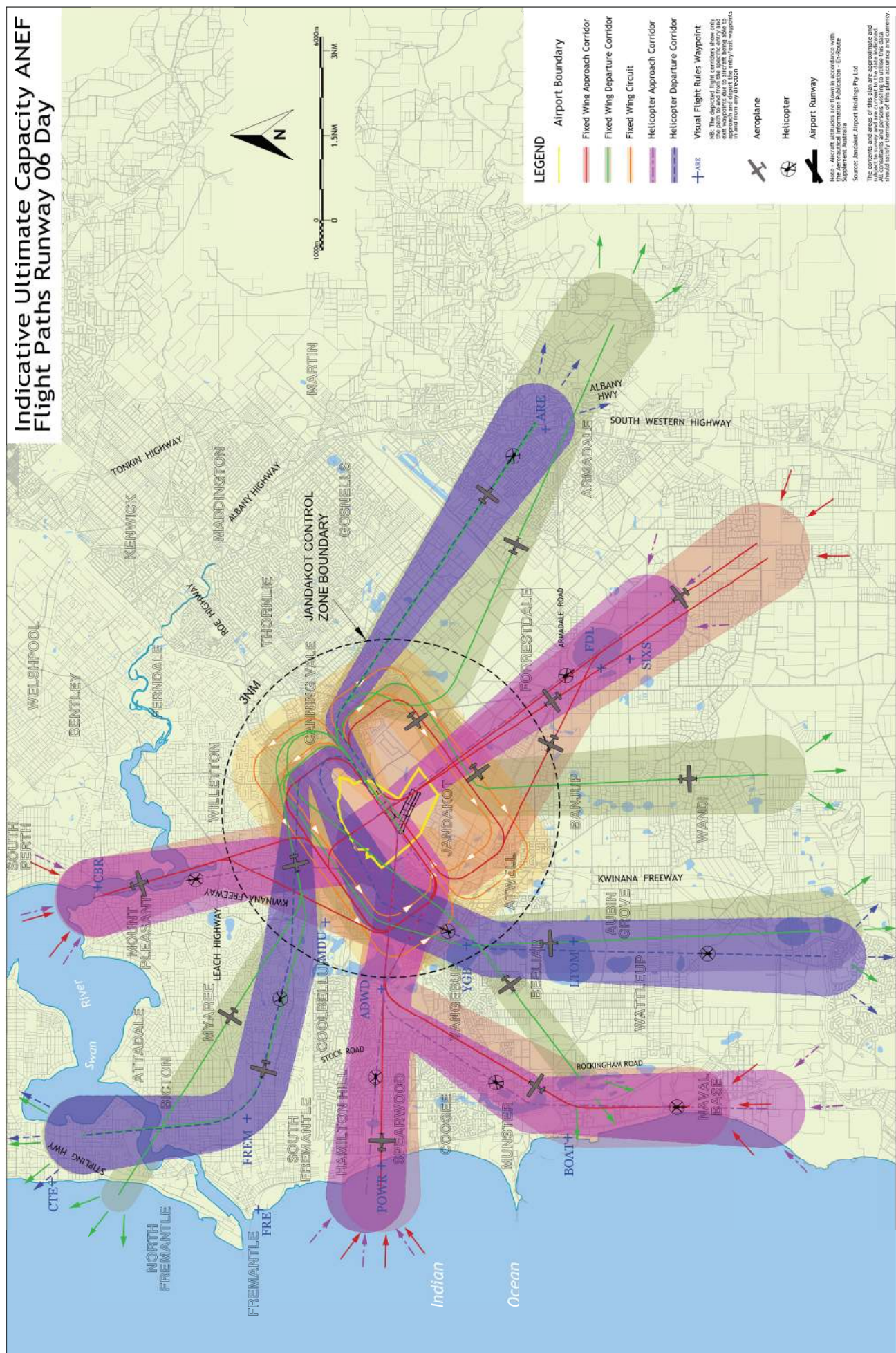
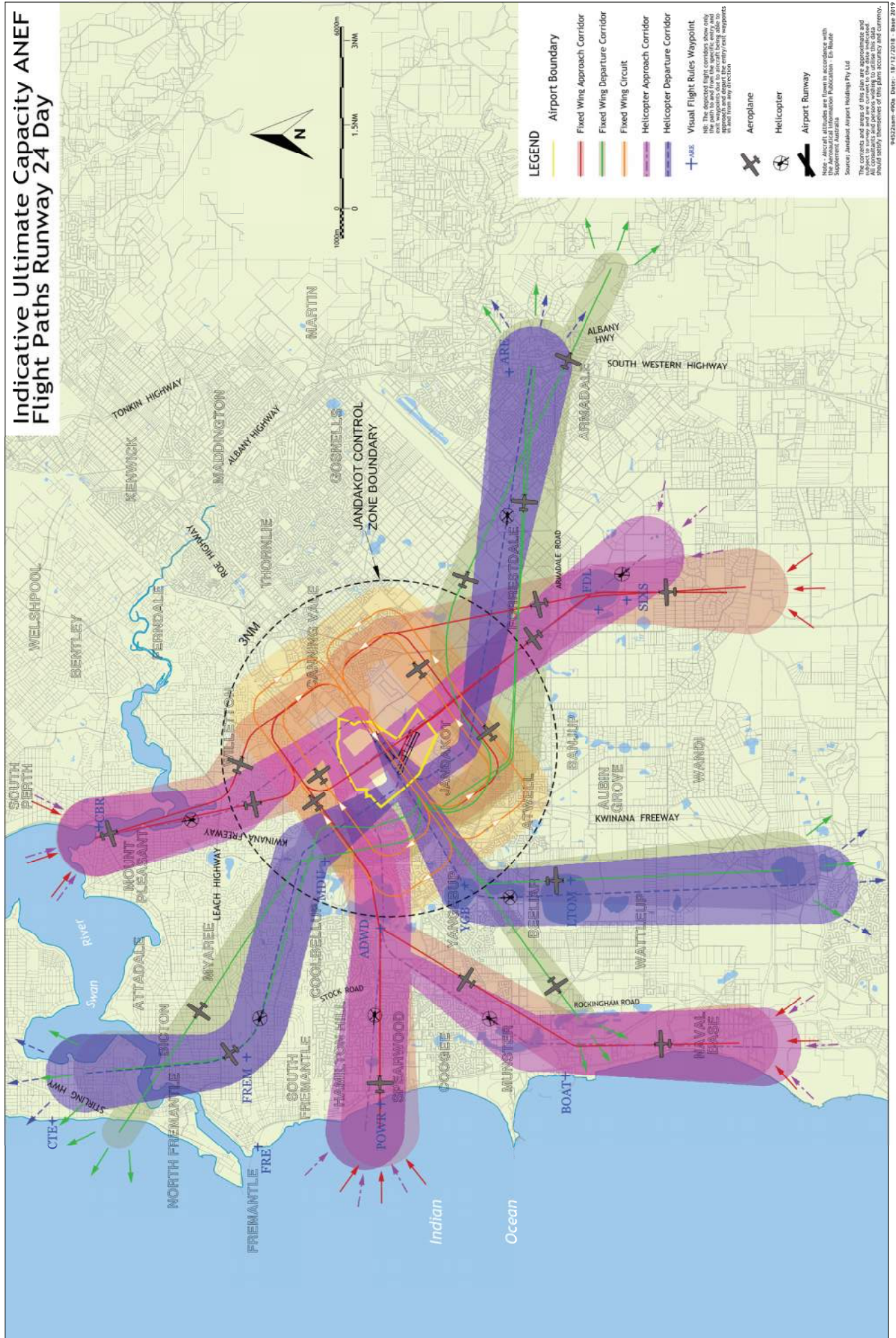


FIGURE 8.9 - INDICATIVE 2039 ANEF FLIGHT PATHS RUNWAY 24 DAY



Indicative Ultimate Capacity ANEF Flight Paths Runway 12 Day

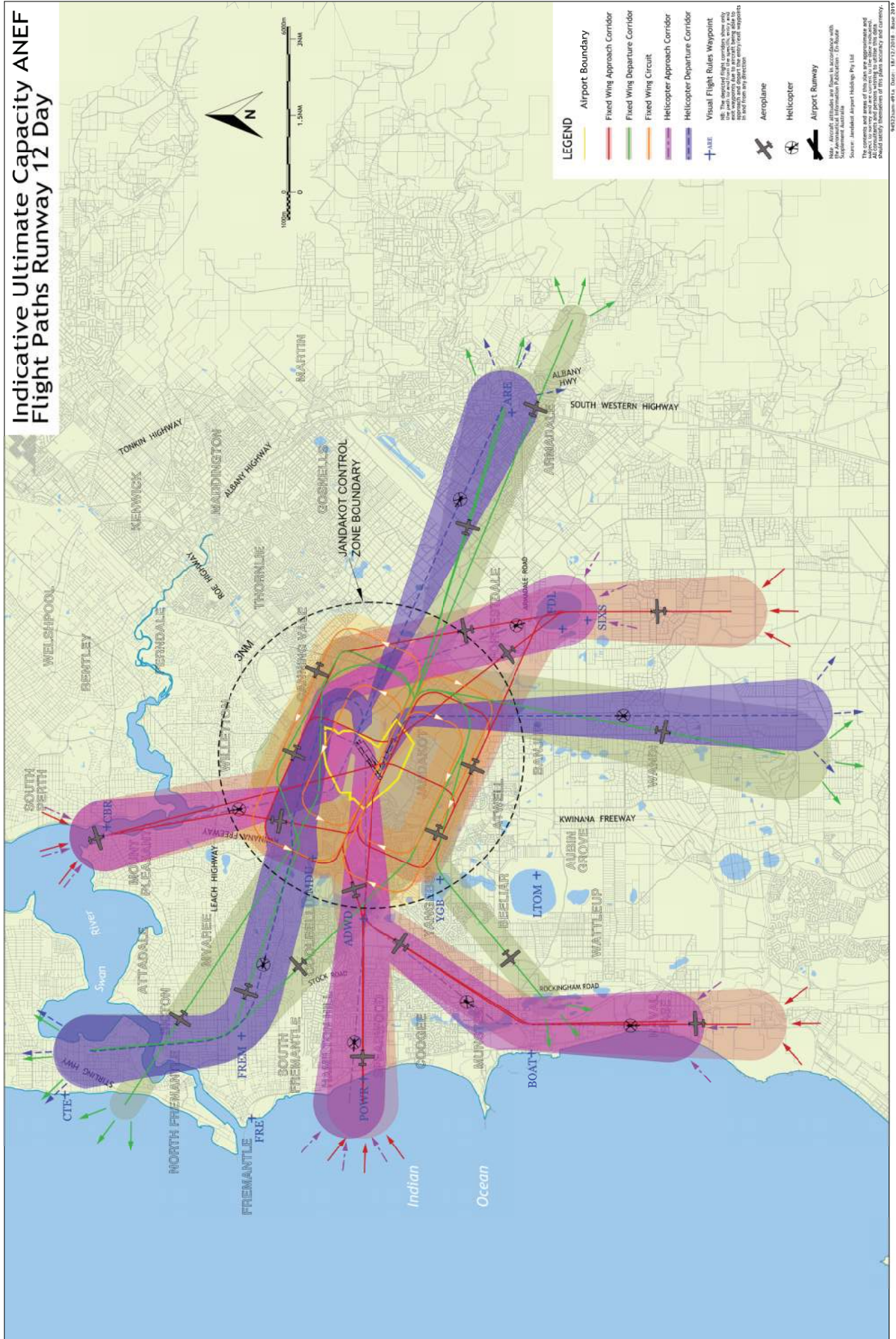


FIGURE 8.11 - INDICATIVE 2039 ANEF FLIGHT PATHS RUNWAY 30 DAY

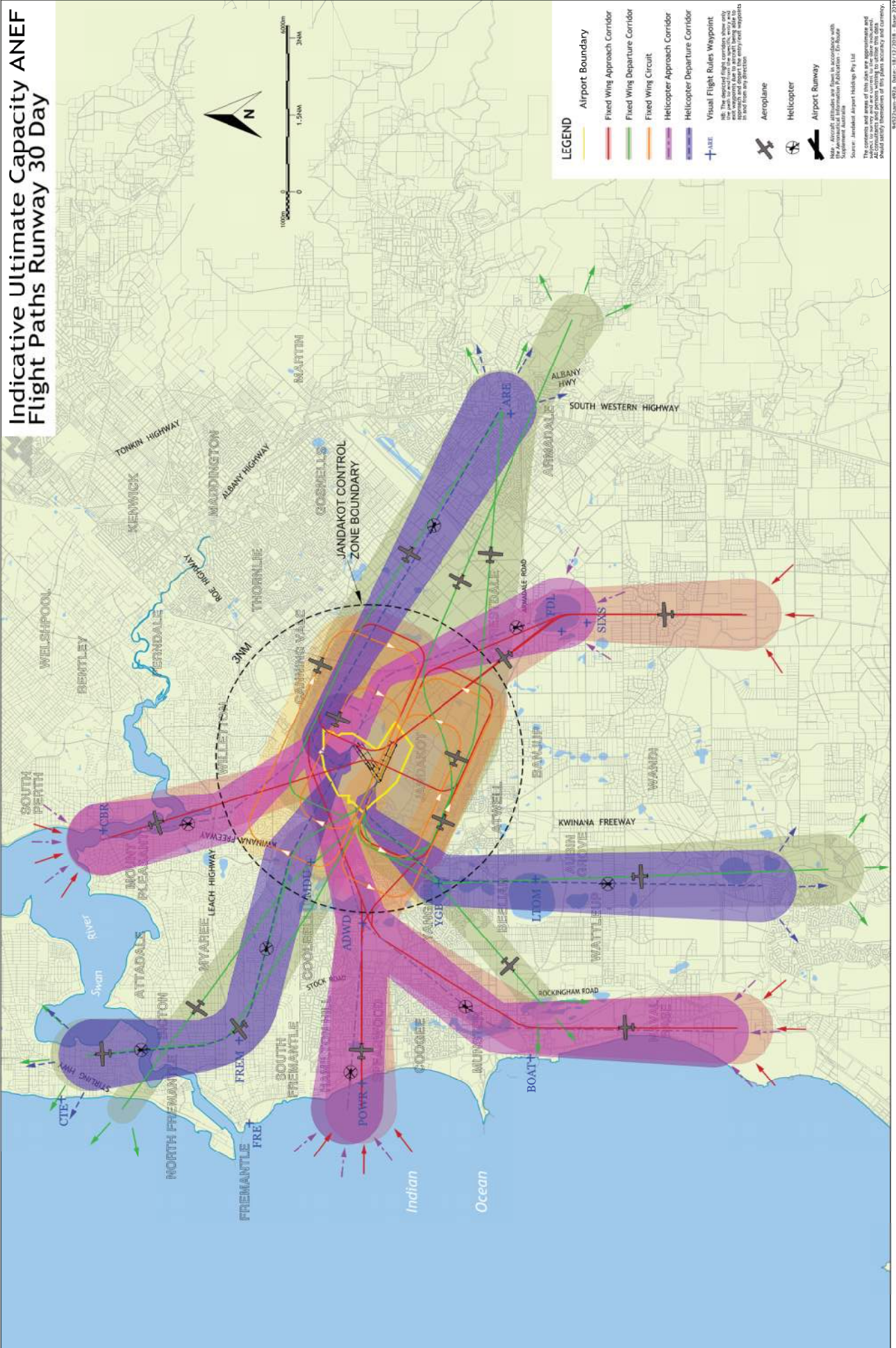


FIGURE 8.12 - INDICATIVE 2039 ANEF FLIGHT PATHS RUNWAY 06 NIGHT

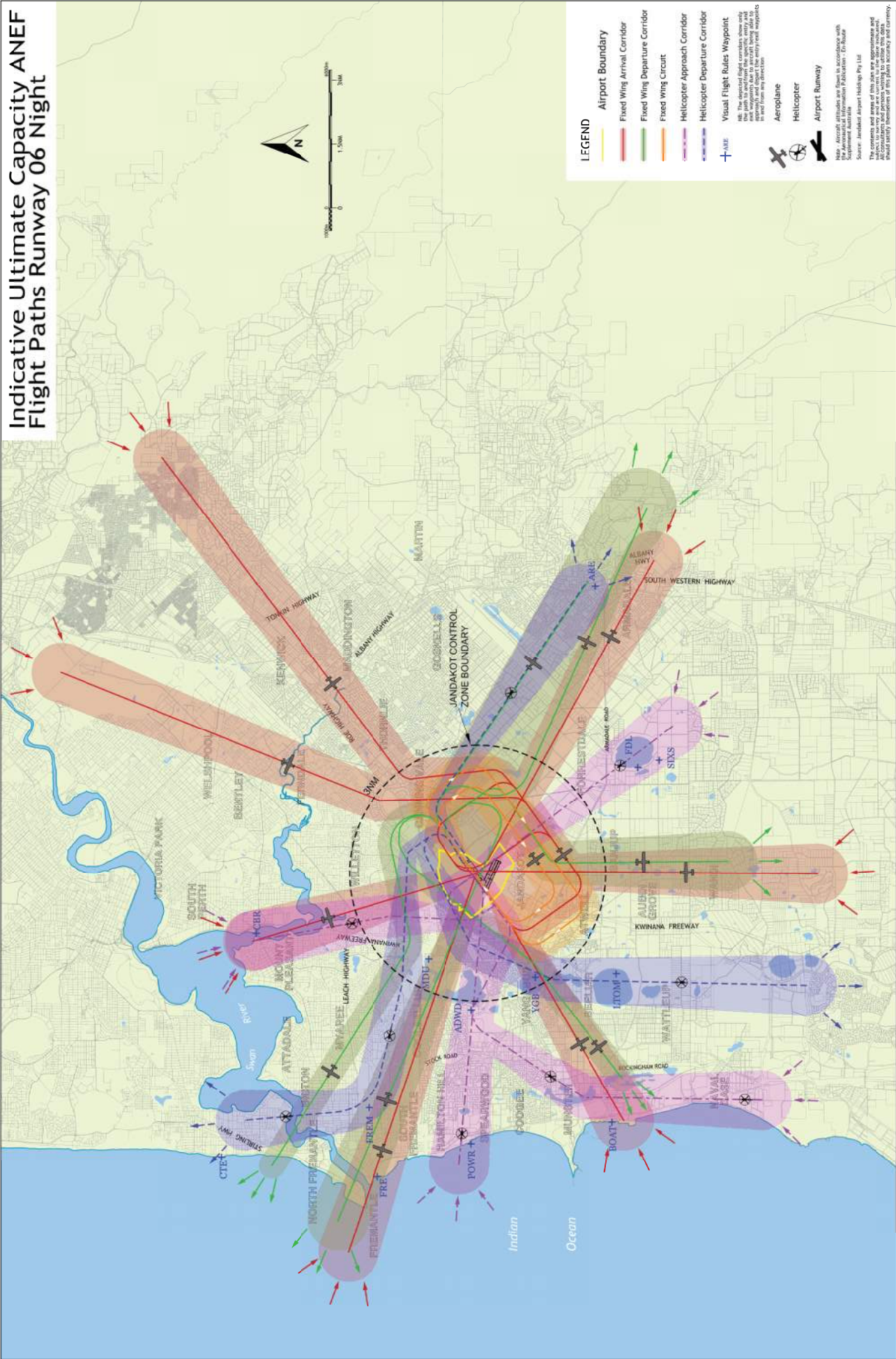


FIGURE 8.13 - INDICATIVE 2039 ANEF FLIGHT PATHS RUNWAY 24 NIGHT



FIGURE 8.14 - INDICATIVE 2039 ANEF FLIGHT PATHS RUNWAY 12 NIGHT

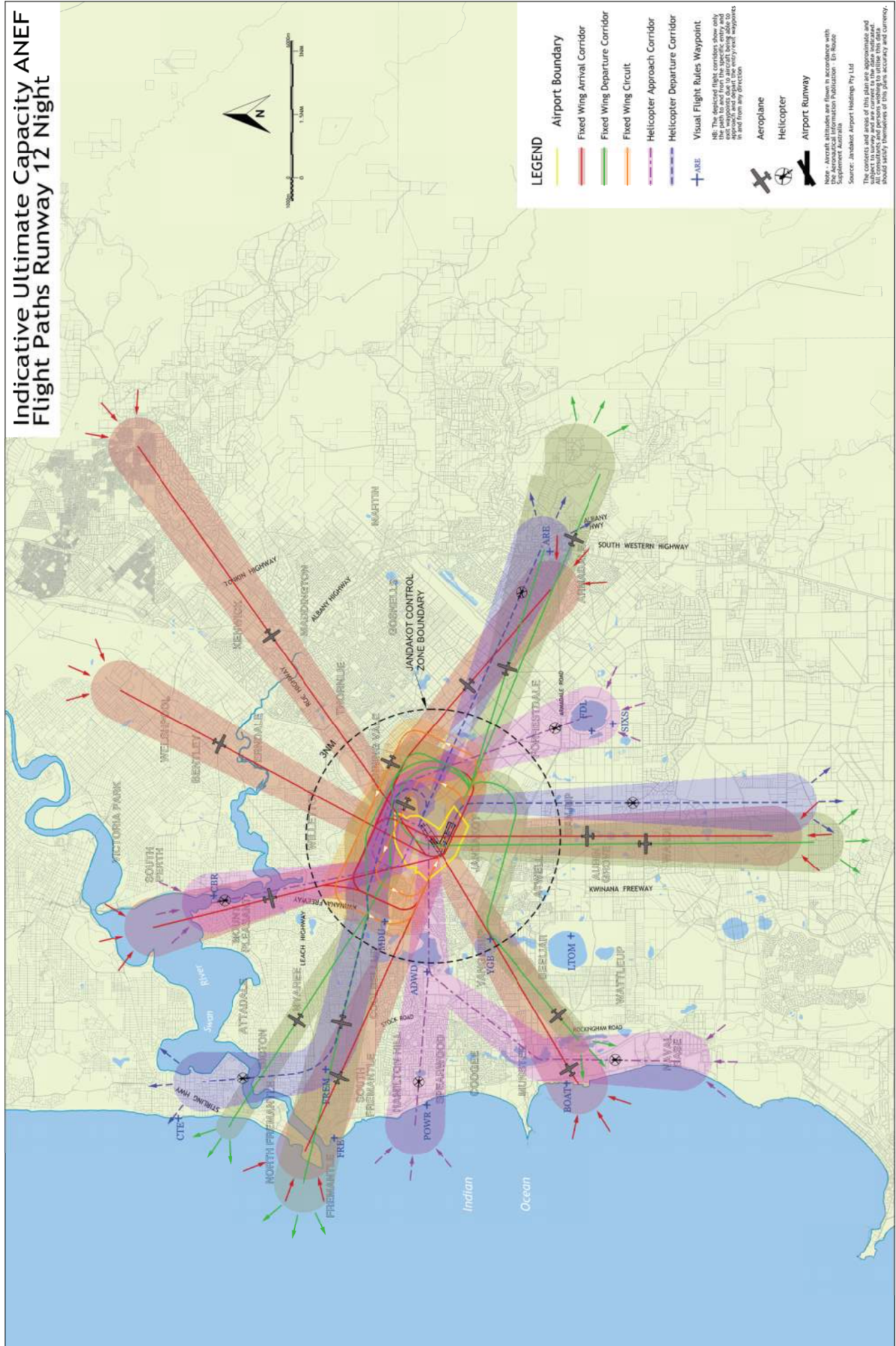
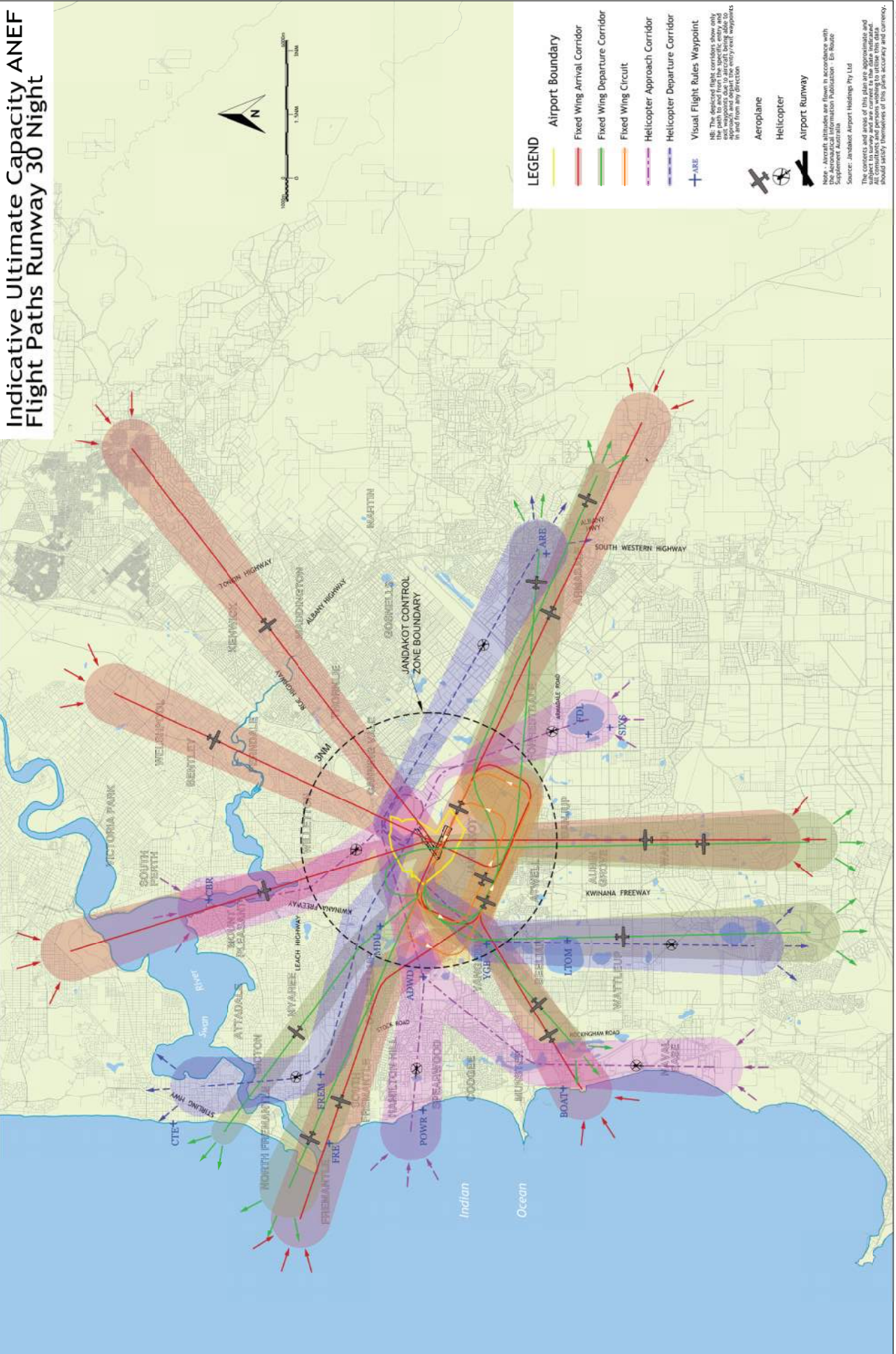


FIGURE 8.15 - INDICATIVE 2039 ANEF FLIGHT PATHS RUNWAY 30 NIGHT



International and national standards have been adopted that define two sets of invisible surface to delineate the various airspace obstacle protection areas: the Obstacle Limitation Surfaces (OLS), and Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS) surfaces. Prescribed airspace is declared by the Australian Government as an area "...in the interests of the safety, efficiency or regularity of existing or future air transport operations into or out of an airport for the airspace to be protected."

There is an active program of engagement with local government and state authorities for managing the risk of intrusions into protected airspace of airports (Guideline F – NASF). This is done mainly through the Jandakot Airport website called "Airspace Protection" which is regularly emailed to local government and state authorities as reminders and also whenever updates are done. The Community Aviation Consultation Group is also a useful forum for discussing airspace protection.

8.4.2 OBSTACLE CONTROL

Any activities that could result in an intrusion of prescribed airspace are referred to as 'controlled activities' that can only be carried out with approval. Controlled activities include:

- Permanent structures, such as buildings;
- Temporary structures, such as cranes; and
- Any activities causing intrusions into the protected airspace through glare from artificial light or reflected sunlight, air turbulence from stacks or vents, smoke, dust, steam or other gasses or particulate matter.

Under the *Airports (Protection of Airspace) Regulations 1996*, details of proposed controlled activities must be provided to JAH as the airport-operator company. JAH will complete an initial assessment to determine whether the activity will cause an intrusion into the prescribed airspace for Jandakot Airport and the extent of any intrusion. If there is an intrusion, JAH is required to seek further assessment from Airservices and the Civil Aviation Safety Authority. These comments will then be provided to the Department of Infrastructure, Transport, Regional Development and Communications to approve/refuse the controlled activity. Controlled activities that are less than 3 months duration may be approved by JAH following assessment by Airservices and the Civil Aviation Safety Authority.

8.4.3 OBSTACLE LIMITATION SURFACES

The Obstacle Limitation Surfaces (OLS) is a combination of reference surfaces in airspace which determine when an object may become an obstacle to aircraft manoeuvring in the vicinity of an Airport or during landing or take-off.

It is possible to have some penetration of the OLS provided that approval is granted to operate with appropriate risk mitigation measures in place.

As the aerodrome operator, JAH is required to establish the OLS in accordance with MOS Part 139. The construction of the fourth runway has been included in the 2005, 2009 and 2014 Master Plans. The 2014 Master Plan also provided for the lengthening of runways 12/30 and 06L/24R. As an OLS is prepared for each Master Plan, the OLS airspace requirements for the fourth runway have been identified and protected since 2005 and the airspace requirements for the lengthening of runways 12/30 and 06L/24R have been protected since 2009. Figure 8.16 depicts the OLS for the ultimate development of the Jandakot Airport.

8.4.4 PROCEDURES FOR AIR NAVIGATION SERVICES – AIRCRAFT OPERATIONS (PANS-OPS)

Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) are a second set of surfaces determined by aircraft flight operations under instrument conditions that form an envelope over the existing obstacle environment. These surfaces are established by instrument procedure designers approved by CASA under Civil Aviation Safety Regulations Part 173, to ensure that an aircraft will have a specified minimum clearance above any accountable obstacle in situations where the pilot is relying entirely on the information derived from cockpit instruments and may have no external visual reference to the ground, to obstacles or to other aircraft. As a result, PANS-OPS surfaces cannot be infringed in any circumstances.

PANS-OPS surfaces may also include protection of the airspace around navigation aids that are required for instrument flying activity.

A review of the PANS-OPS was undertaken for Master Plan 2009 to include the extensions of runways 06L/24R and 12/30. The fourth runway will not facilitate instrument procedures and therefore does not affect the PANS-OPS. A further PANS-OPS review has been undertaken to assess the potential relocation of the Non-Directional Beacon (see Section 4.8.2) and to

include a new standard instrument departure. The new standard instrument departure has been proposed by Airservices to facilitate instrument flight rule (IFR) departures to the south from any primary runway direction. The proposed instrument departure will utilise existing flight tracks to the south and will avoid the delays for aircraft currently looking to enter Perth Controlled Airspace.

Figure 8.17 depicts the PANS-OPS surfaces for the ultimate development of the Jandakot Airport and is provided as a guide only to obstacle management within the vicinity of the airport. Obstacles recognised as being close to the surface limits identified are to be referred to a suitably qualified designer for accurate assessment.

8.5 EXTERNAL LIGHTING RESTRICTIONS

The Civil Aviation Safety Authority has the authority, under the Civil Aviation Regulations 1988, to control ground lights where they have the potential to cause confusion or distraction (from glare) to pilots in the air. CASA has established guidelines, through the Manual of Standards Part 139, on the location and permitted intensities of ground lights within a 6km radius of airports.

Figure 8.18 depicts the Restricted Light Zones at Jandakot Airport. The four light control zones reflect the degree of interference ground lights can cause as a pilot approaches to land.

The existence of a certain type of light fitting is not necessarily an indication that more lights of the same type can be added to the same area. It is important that the NASF 'Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports' guidelines are consulted or CASA advice sought when new sources of significant lighting (such as freeway, construction or stadium flood lighting) is being planned in the vicinity of airports.

8.6 WINDSHEAR AND TURBULENCE

The location of a significant obstacle, such as a building, in the path of a cross-wind to an operational runway can pose a safety risk to aircraft operations by creating windshear and turbulence. The National Airports Safeguarding Framework 'Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports' notes that windshear poses the greatest risk

on approach, landing and take-off when the aircraft's speed is low and pilot's ability to respond is limited.

JAH applies the Guideline B criteria to proposed developments to determine whether there is a potential for windshear from proposed developments to affect aircraft movements.

8.7 WILDLIFE HAZARD MANAGEMENT

Birds and other animals can pose a serious safety risk to aircraft operations. JAH is required to monitor and control the presence of birds and animals on, or in the vicinity, of the airport in accordance with the Civil Aviation Safety Regulations Part 139. JAH has a Wildlife Hazard Management Plan that defines the methods applied to control birds and animal hazards on airport, as well as a Feral Animal Management Plan to address overabundant native species. These control measures include permanent and temporary fauna exclusion fencing, vehicle harassment and the use of pyrotechnics (shotgun cartridge) for both bird and macropod management within the aircraft manoeuvring area, and managing features of the airport and its surrounds that are attractive to problem bird and animal species.

Monitoring of animal and bird hazards is continually carried out to identify habitats and numbers, with seasonal expert advice sought when necessary. When required, Notices to Airmen (NOTAM) are issued to notify aircraft operators of increased bird or animal hazards. Under the *Air Navigation Act 1920*, aircraft bird and animal strikes are classified as an air safety incident and must be reported to the Australian Transport Safety Bureau.

The National Airports Safeguarding Framework 'Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports' acknowledges that new land uses in the vicinity of an airport can significantly influence the risk of wildlife hazards to aircraft operations. Management of activities that may be wildlife attractant are addressed through Operational Environmental Management Plans that are required to be prepared for all relevant and existing developments within the airport site. When required, approaches are made to local councils to discuss external planning or developments that may increase bird and animal hazards at the airport, such as the location of rubbish tips.

8.8 COMMUNICATION, NAVIGATION AND SURVEILLANCE INFRASTRUCTURE

Airservices Australia provides and maintains a Non-Directional Beacon at Jandakot Airport to facilitate location navigation for aircraft arrivals and departures. In addition, a microwave communication link exists between the Jandakot and Perth Air Traffic Control Towers. These navigation and communication links rely on the transmission of radio waves that must be protected from structures or obstacles that could cause signal refraction or interference.

The National Airports Safeguarding Framework Guideline G Protecting Aviation Facilities – Communication, Navigation and Surveillance (CNS) requires consideration for the protection of this critical infrastructure. Information about relevant developments is provided to Airservices to allow an assessment to be made to ensure that the performance of current and future navigation and communication aids is maintained.

8.9 PUBLIC SAFETY ZONES

The National Airports Safeguarding Framework Guideline I: Managing The Risk in Public Safety Areas at the ends of Runways Consideration of Public Safety requirements was undertaken and is detailed in Section 4.7.4.

8.10 IMPROVING AIRPORT SAFEGUARDING

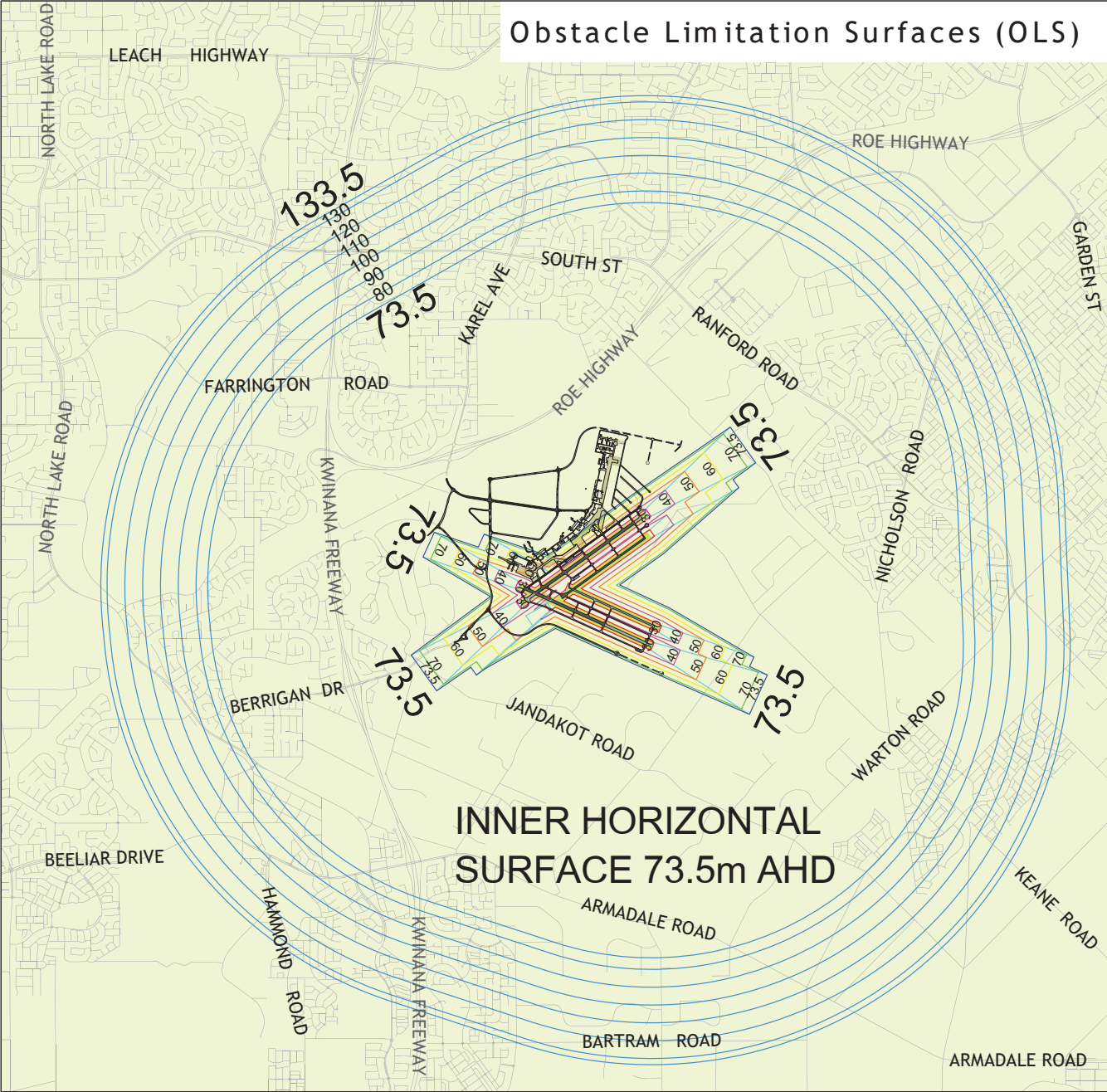
The State Government recognises Jandakot Airport as a vital piece of infrastructure and therefore the need to protect the airport from encroachment by incompatible land use and development, so as to provide for its ongoing, safe, and efficient operation. In this regard the Western Australian Planning Commission has prepared State Planning Policy 5.3 – Land Use Planning in the Vicinity of Jandakot Airport in January 2017 (SPP 5.3), which references into the policy the current ANEF as prepared by Jandakot Airport at the time, as outlined in Section 2.3.6.

Given that the airport is situated within an urban growth zone, JAH believes that proactive consultation is required with developers, local councils and State Government authorities at the planning and development stages. Potential residents need to be made aware of airport operations and aircraft noise prior to purchasing property within a 5km radius of the airport in order to make an informed decision about the level of noise

they will be exposed to. JAH will continue to respond to residential planning proposals in the vicinity of the airport to request additional measures such as notifications on land titles for development within the N60 100 daily noise event contours, adequate noise attenuation measures (e.g. window glazing), aircraft noise impact area signage and provision of aircraft noise impact information to potential residents.

The NASF 'Guideline A: Measures for Managing Impacts of Aircraft Noise' acknowledges that the 20 ANEF and 25 ANEF zones do not capture all high noise affected areas around an airport and that Australian Standard AS2021 recognises that the ANEF contours are not necessarily an indicator of the full spread of noise impacts, particularly for residents newly exposed to aircraft noise. JAH fully supports the inclusion of the frequency-based noise charts (N60, N65 & N70 Noise Contours) to supplement the ANEF as recommended in NASF Guideline A.

FIGURE 8.16 - OBSTACLE LIMITATION SURFACE



APPROACH AND TAKE-OFF SURFACES DATA														
RWY	CATEGORY	APPROACH SURFACES						TAKE-OFF CLIMB SURFACES						
		ORIGIN (CHGE)	HEIGHT (m)	INNER EDGE WIDTH (m)	DIVERGENCE (%)	SLOPE (%)	LENGTH (m)	TRANSITION (%)	ORIGIN (CHGE)	HEIGHT (m)	INNER EDGE WIDTH (m)	DIVERGENCE (%)	SLOPE (%)	LENGTH (m)
06L X	2 I/NP	470	28.8	90	15	3.33	2500	20	2190	28.6	80	10	4	2500
06R E	2 NI	819	28.9	80	10	4	2500	20	2500	28.6	80	10	4	2500
24L E	2 NI	2090	28.6	80	10	4	2500	20	708	29.4	80	10	4	2500
24R X	2 I/NP	2190	28.6	90	15	3.33	2500	20	470	28.8	80	10	4	2500
12L P	2 NI	1820	28.7	80	10	4	2500	20	2930	29.6	80	10	4	2500
12R E	2 NI	1302	28.4	80	10	4	2500	20	2500	29.6	80	10	4	2500
30L X	2 I/NP	2930	29.6	90	15	3.33	2500	20	1302	28.4	80	10	4	2500
30R P	2 NI	2930	29.6	80	10	4	2500	20	1820	28.7	80	10	4	2500

NOTES:

- 1 LEVEL DATUM ADOPTED – 28.5m AHD.
- 2 INNER HORIZONTAL SURFACE – RADIUS 3500m FOR CODE 2 INSTRUMENT RUNWAYS, 45m ABOVE LEVEL DATUM.
- 3 CONICAL SURFACE – SLOPE 5% TO 60m ABOVE INNER HORIZONTAL SURFACE FOR CODE 2 INSTRUMENT RUNWAYS.
- 4 TABLE ABBREVIATIONS
 - E – EXISTING RUNWAY
 - X – EXTENDED RUNWAY
 - P – PROPOSED RUNWAY
 - 2 I/NP – INSTRUMENT/NON-PRECISION CODE 2

Source: Jandakot Airport Holdings Pty Ltd

The contents and areas of this plan are approximate and subject to survey and are current to the date indicated. All consultants and persons wishing to utilise this data should satisfy themselves of this plans accuracy and currency.

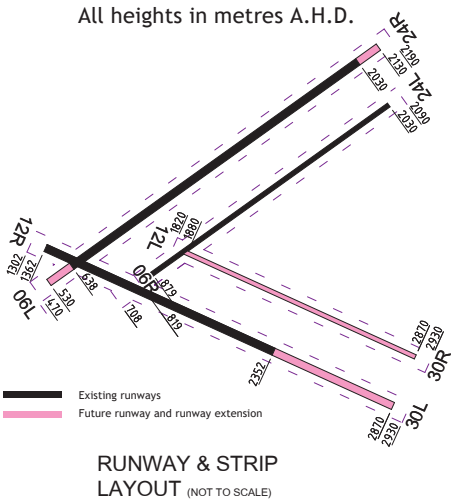
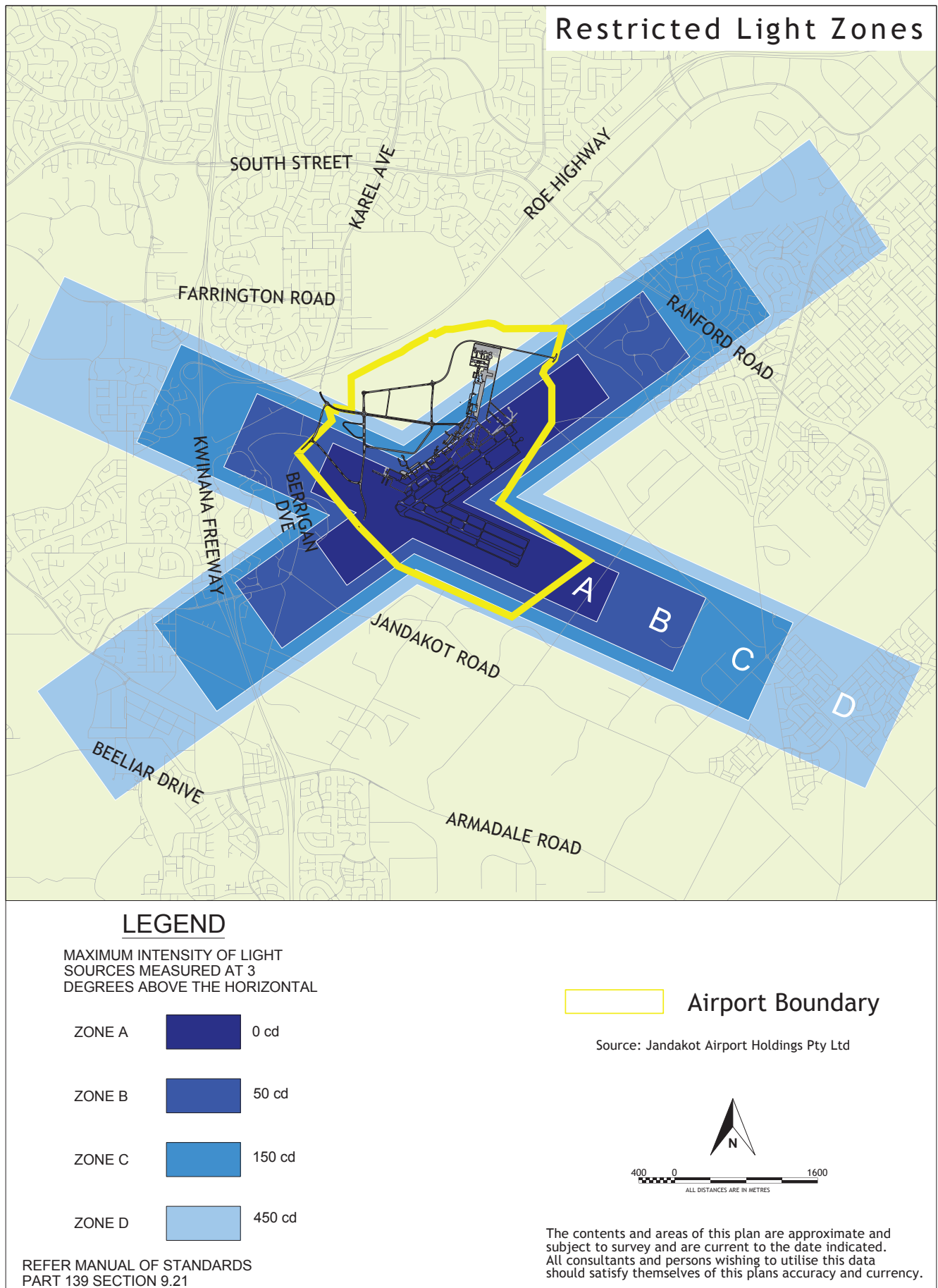


FIGURE 8.17 - PROCEDURES FOR AIR NAVIGATION SERVICES - AIRCRAFT OPERATIONS



FIGURE 8.18 - RESTRICTED LIGHT ZONES



9. ENVIRONMENT STRATEGY

9.1 OVERVIEW

In managing and developing the airport, Jandakot Airport Holdings complies with the *Airports Act 1996* and *Airports (Environment Protection) Regulations 1997*. In accordance with the Act, Jandakot Airport is required to produce a final Master Plan which includes an Environment Strategy.

The Jandakot Airport Environment Strategy 2020 (the Environment Strategy) outlines Jandakot Airport's environment management objectives for the eight year period from 2020 and describes how JAH will meet its environmental obligations as detailed in the Act.

The Environment Strategy builds upon the Environment Management Framework (EMF) which incorporates measures to meet Jandakot Airport's obligations under Commonwealth and relevant State legislation. This Environment Strategy has been developed with consideration of current airport operations as well as proposed future development.

9.1.1 STAKEHOLDER CONSULTATION

In preparing the Environment Strategy, JAH has undertaken significant consultation with key stakeholders including Federal, State and Local Governments, aviation users and community groups. Details of the consultation undertaken are summarised in Chapter 10.

9.1.2 MANAGEMENT STRUCTURE AND RESPONSIBILITIES

As the leaseholder of Jandakot Airport, JAH has the ultimate responsibility for environmental management at the airport.

Roles, responsibilities and authorities of JAH personnel are defined in the Environmental Management System to ensure effective implementation of systems and procedures. All JAH staff, tenants and general users of the airport have a responsibility to protect the environment of the airport through the *Airports (Environment Protection) Regulations 1997*, conditions and other applicable legislation.

To ensure the successful implementation and operation of the Environment Strategy (EMS), responsibility has been assigned to the parties listed in Table 9.1.

TENANTS

The airport hosts a wide variety of tenants whose activities include aircraft operations, aircraft maintenance, flight training, accommodation, retail, warehousing, distribution, and industrial operations.

Airport tenants are responsible for managing their own operations in an environmentally responsible manner in accordance with the Environment Strategy 2020, which will be made available on the JAH website.

JAH ensures that tenants comply with their airport environmental management responsibilities via a number of procedures and processes, including:

- Conditions detailed within leases and licenses;
- Tenant Construction Environmental Management Plans (CEMP) and Operational Environmental Management Plans (OEMP);
- Conditions of approval for developments, building and works applications;
- Environmental site assessments for lease terminations;
- Tenant site inspections and audits; and
- Incident reporting.

Table 9.1 Implementation of the Environment Strategy

Party	Responsibility
Board of Directors (including Managing Director)	The environmental performance of JAH Periodic review of the JAH Environment Policy Allocation of resources to manage environmental issues Ensuring JAH staff fulfil their environmental responsibilities
JAH Management Committee	Providing guidance on implementation of the JAH EMS Assistance in implementation of the Environment Strategy
JAH Safety Management System Committee	Monitoring and providing feedback on the implementation of the JAH EMS Review of JAH's environmental performance, including incidents and non-conformances, audit results, training needs, significant aspects, progress against objectives and targets, and regulatory compliance
JAH Environment Manager (supported by the Environment Coordinator)	Preparing the Environment Strategy and monitoring its implementation Reviewing of the JAH EMS Preparing and monitoring implementation of the airport's management plans and programmes Ensuring compliance with regulatory requirements Preparation of the Annual Environment Report Providing environmental advice and training to staff and contractors Assisting staff, tenants and contractors with environmental compliance Environmental incident response and investigation
JAH Managers (including Airport Operations Manager, Facilities Manager, Building Approvals Manager)	Management of daily environmental issues associated with their department's operations Ensuring that operations comply with applicable legislation and EMS requirements Identification of staff training needs Integration of environmental requirements into daily operations Staff environmental awareness
JAH Staff	Reporting environmental incidents, non-conformances and complaints Adhering to relevant EMS policies and procedures Undertaking work in compliance with applicable environmental legislation Participation in environmental training and awareness
JAH Contractors	Reporting environmental incidents, non-conformances and complaints Adhering to relevant EMS policies and procedures Undertaking work in compliance with applicable environmental legislation Participation in site inductions and relevant environmental training and awareness programs Development and implementation of Construction Environmental Management Plans as required

9.2 ENVIRONMENT MANAGEMENT FRAMEWORK

The JAH Environmental Management Framework is presented in Figure 9.1. This framework was reviewed in conjunction with the development of the Master Plan 2020 and is based on the internationally recognised "Plan – Do – Check – Act" philosophy. The key elements of the framework are outlined below.

9.2.1 ENVIRONMENT POLICY

JAH's Environment Policy guides the management of the natural environment at Jandakot Airport. The Policy is as follows:

Jandakot Airport Holdings Pty Ltd manages and operates Jandakot Airport, Western Australia's premier General Aviation aerodrome. Jandakot Airport covers an area of 622ha, including aviation operations, commercial and conservation precincts.

JAH recognises its responsibility to the environment at the airport. To achieve this, JAH commits to establishing and maintaining an environmental management system that strives to:

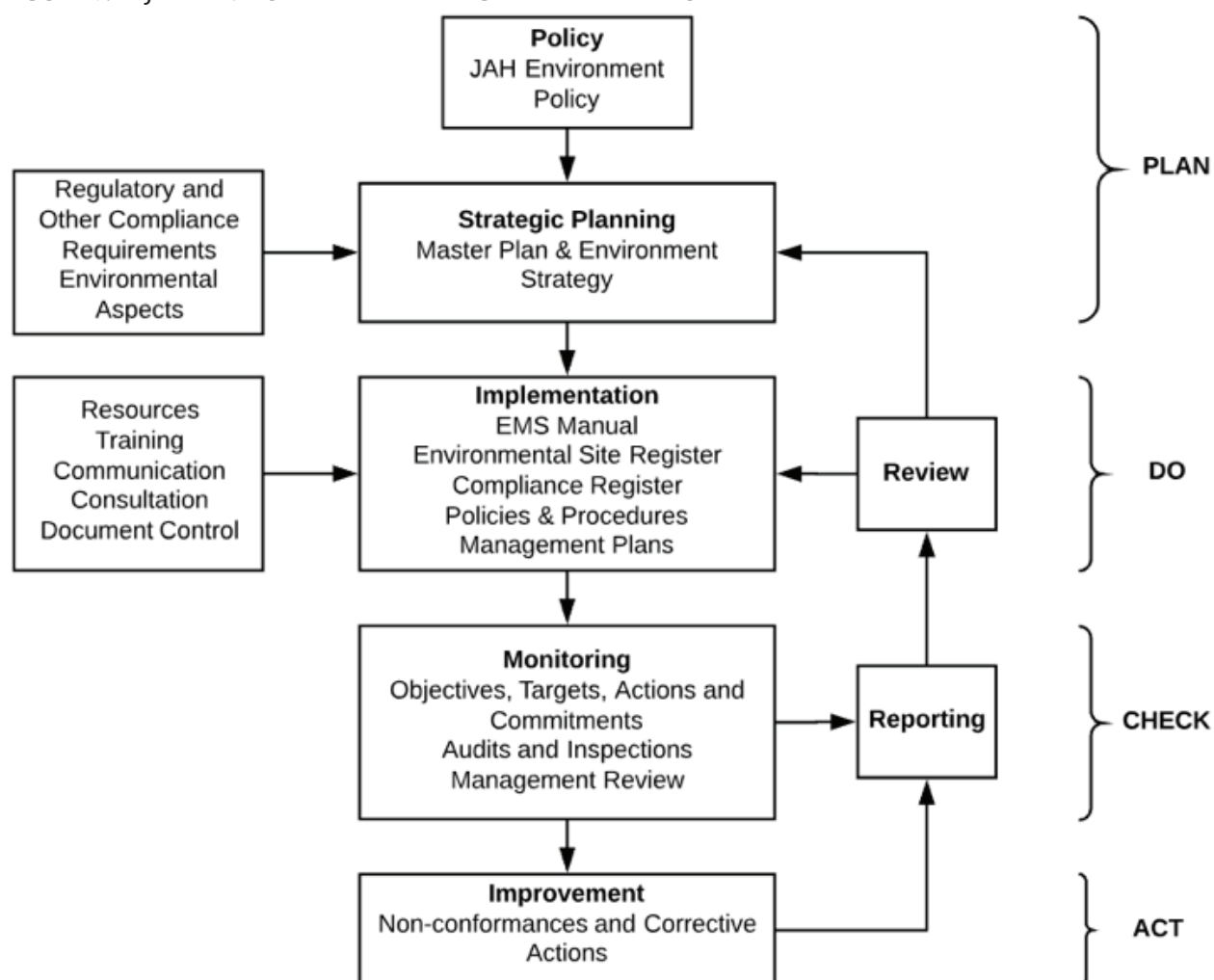
- Develop and manage Jandakot Airport in an environmentally responsible manner;
- Comply with environmental legislation;
- Work with relevant authorities to identify specific objectives and targets that aim to minimise adverse environmental impacts, including the prevention of pollution;
- Pursue opportunities for efficient use of resources; and
- Manage, measure, and report on our environmental performance.

JAH is committed to the continual improvement of the environmental management system. All employees, contractors, tenants, and operators have a duty to meet their environmental responsibilities under the EMS.

9.2.2 ENVIRONMENTAL MANAGEMENT SYSTEM

Achievement of the Environment Strategy targets is facilitated by the development, implementation and continual improvement of the JAH Environmental Management System (EMS). Initially developed in 2004, the EMS is consistent with AS/NZS ISO 14001:2015. The EMS extends to all activities and organisations over which JAH has control or influence. This includes JAH employees, tenants, visitors and contractors to varying degrees.

FIGURE 9.1 - JAH ENVIRONMENTAL MANAGEMENT FRAMEWORK



The Jandakot Airport EMS Manual documents the structure of the EMS and how it complies with the I 4001 Standard. The manual is comprised of six headline areas that comprise the EMS, each providing direction on the specific area and links to related documents and processes. These headline areas and select related documents are:

- Leadership – Defines management commitment (Environment Policy) and roles and responsibilities;
- Planning – Identifies risk assessment process and recording (Risk Register), definition of environmental aspect identification process (Safety Management System manual), compliance obligations and procedures (Compliance Register; Legal Register) and environmental objectives (Master Plan and Objectives and Performance Indicators Register);
- Support – Establishes the commitment to resources to manage the environment at Jandakot Airport, including implementation of the EMS. Establishes requirements for documented information (Controlled Documents), competence (Training, Contractor Management) and communication and awareness for JAH staff, tenants and contractors (Communication and Consultation Procedure, tenant Operational Environmental Management Plans and Community Aviation Consultative Group);
- Operations – Defines processes to ensure internal and external requirements are met by JAH and contractors (Contractor Management). Also provides procedures for emergency preparedness and response;
- Performance Evaluation – Defines the components and procedures for monitoring, measurement, analysis and evaluation of JAH activities (Environmental Site Register), audits and inspections (Audit and Management Review Procedure) and EMS review process (EMS Management Review Agenda); and
- Improvement – Defines reporting procedures for nonconformity and corrective action and continual improvement (Incident Reporting and Investigation Procedure, Corrective and Preventative Actions Procedure, Annual Environmental Report).

JAH's environmental policies and procedures are updated regularly to reflect changes in legislation, activities and information.

The EMS Manual is authorised by the Managing Director and reviewed regularly or when activities/processes change.

An expanded explanation of a number of the key components of JAH's EMS follows.

MANAGEMENT PLANS

A number of environmental factors at the airport are managed through specific management plans and strategies. These include the following:

- Conservation Management Plan, which includes:
 - Weed Management Plan;
 - Dieback Management Plan;
 - Bushland Rehabilitation and Revegetation guidelines;
 - Feral Animal Management Plan;
 - Bushfire Management Plan;
 - Wildlife Fencing and Underpass Strategy; and
 - Heritage Management Plan;
- Local Water Management Strategy;
- Water Efficiency Management Plan;
- Groundwater Management Plan;
- Jandakot Airport Offset Plan; and
- Construction Environmental Management Plan for Clearing and Civil Works associated with EPBC 2009/4796.

Many of these plans, such as the Conservation Management Plan, are linked to EPBC approval conditions and require the approval of the Minister for the Environment.

Other Management Plans are driven by internal requirements, identified as part of the Environment Strategy and EMS as necessary for the successful management of the environment at the airport. These include Construction and Operational Environmental Management Plans.

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLANS

Construction/civil works (including demolition) with the potential for environmental impacts require a Construction Environmental Management Plan (CEMP), which must be reviewed and endorsed by the JAH Environment Department prior to works commencing. The requirement for CEMPs is typically included as a condition of the building/works/demolition permit. Where works are of a limited scope and involve minimal environmental risk, documentation other than

a CEMP (e.g. Method of Work Plan, Safe Work Method Statement) may be substituted so long as:

- It is permitted within the conditions of the approved permit issued by the Airport Building Controller; and
- The alternative documentation adequately identifies environmental risks and means by which those risks are mitigated and managed.

Clearing and construction activities associated with EPBC approved projects are undertaken in accordance with relevant CEMPs (as required by the conditions of approval) which must be approved by the Minister for the Environment.

TENANT OPERATIONAL ENVIRONMENTAL MANAGEMENT PLANS

Jandakot Airport tenants are responsible for managing their own operations in an environmentally responsible manner. JAH has developed guidelines and templates to assist tenants in the development of Operational Environmental Management Plans (OEMPs).

The requirement for a tenant OEMP is directly linked to a tenant's environmental risk profile.

In accordance with the Jandakot Airport Tenant Environmental Risk Allocation and Auditing Frequency Criteria, tenants assessed as having a 'Low' environmental risk profile may be provided with an OEMP exemption following a documented site inspection by JAH Environment Department staff.

TRAINING, CONSULTATION AND COMMUNICATION

Training and awareness are integral to the effectiveness of the EMS, with employees, contractors and tenants requiring a sound understanding of the issues surrounding environmental management of the airport, along with regulatory requirements, internal standards, policies and objectives.

JAH has established a training process in which all employees and contractors are required to complete an induction. This ensures that prior to the commencement of work, the individual understands: the importance of environmental management at Jandakot Airport; their role in the EMS; and any specific instructions pertaining to their actual tasks.

A training needs analysis, which details mandatory and optional training per position, is utilised to identify any gaps or updates to employee training required.

Training and awareness is a component of all OEMPs and CEMPs, thus ensuring that tenants and construction contractors provide appropriate environmental training and awareness to their staff, contractors and visitors.

Appropriate communication with various stakeholders both within and outside of JAH ensures awareness of environmental management measures undertaken across the airport, and allows for the identification of improvement opportunities based on consultation feedback.

There are a number of internal and external communication and consultation methods established by JAH, including:

- Internal meetings;
- Staff noticeboards;
- The JAH website, which is the primary source of information for tenants and other users of the airport; and
- Stakeholder and regulatory meetings.

A key communication tool is the Tenant Environmental Handbook, developed by JAH to assist tenants in understanding their environmental obligations at Jandakot Airport. It also provides information of a general nature to assist in meeting those obligations. The Tenant Environmental Handbook is published electronically on the JAH website along with other relevant tenant environmental resources.

MONITORING

Regular monitoring ensures that changes in environmental conditions or events of non-compliance are noted, allowing for corrective measures to be implemented. Monitoring provides ongoing data which can be assessed against legislative compliance and result in improved management of environmental values.

In order to meet regulatory targets and other commitments, JAH undertakes several environmental monitoring programmes that are carried out by qualified professionals when required (as summarised in Table 9.2). In many instances, monitoring requirements are detailed within relevant management plans (CMP, CEMP and Groundwater Management Plan) which are

approved by the Department of Agriculture, Water and the Environment and linked to EPBC conditions of approval.

Table 9.2 Summary of Environmental Monitoring Undertaken at Jandakot Airport

Monitoring Type	Frequency
Groundwater quality	As defined in Groundwater Management Plan
Groundwater abstraction	Monthly
Scheme water usage	Every two months
Airside fauna monitoring	Daily
Soil testing	As required
Archaeological	As required during clearing and earthworks
Energy usage	Monthly
Flora	Seasonally as defined in CMP
Fauna	As defined in CMP
Introduced plant species	As defined in CMP
Dieback	Triennially
Tenant audits	Based on risk profile
Compliance obligations	Annually
EMS	Annually

TENANT AUDITS AND INSPECTIONS

Tenant audits are an important monitoring tool, used to demonstrate that operators are undertaking activities in line with regulatory and JAH requirements. Audits are undertaken to determine a tenant's compliance with the JAH Environment Strategy and their own OEMP.

In addition to audits, JAH completes tenant inspections that may be undertaken to:

- Investigate a particular environmental management issue in between scheduled audits; and
- Confirm the low risk status of a site prior to issuing an OEMP exemption.

Tenants and construction contractors with a CEMP may also be subjected to inspections to determine compliance with JAH requirements.

ENVIRONMENTAL SITE ASSESSMENTS

Prior to the expiry, transfer or termination of a tenant sub-lease, JAH reviews the activities that have occurred on site during the term of the lease and determines whether the likelihood of soil or groundwater contamination exists. If past or current activities on the site have the potential to result in soil or groundwater

contamination, then an environmental investigation of the leased site is undertaken by the departing tenant consistent with the requirements of the *Airports (Environment Protection) Regulations 1997*.

If the Environmental Site Assessment concludes that the site is likely to be contaminated, further investigations are undertaken to define the presence, nature, magnitude and extent of contamination and recommend if appropriate remediation and/or monitoring is required.

REPORTING

JAH will produce an Annual Environment Report (AER) both for internal review purposes and submission to the Department of Infrastructure, Transport, Regional Development and Communications and the Department of Agriculture, Water and the Environment.

These reports include updated information on:

- Targets within this Environment Strategy;
- Commitments and actions as detailed within Management Plans associated with EPBC conditions of approval;
- Any additional contaminated sites;
- Remediation measures undertaken at known contaminated sites;
- Results of any investigations or monitoring undertaken; and
- Details of any environmental complaints or incidents.

INCIDENT AND NON-CONFORMANCE

REPORTING

JAH staff, tenants and contractors are required to report environmental incidents and non-conformances to JAH. Incidents include spills that have the potential to result in environmental harm, as well as complaints, aircraft wildlife hazards and other non-conformances. Incidents and non-conformances are recorded within the JAH Safety Management System and are subject to an initial investigation and if warranted, corrective actions are identified. For incidents resulting in potential contamination, corrective actions may include groundwater and/or soil sampling or the development and implementation of a remediation programme.

REVIEW

In order to achieve continual improvement, elements of the JAH Environmental Management Framework and EMS (e.g. policies, procedures, management plans etc.) are periodically reviewed and amended as part of scheduled actions, or in response to new and updated information that may arise from audits, monitoring or other means.

The entire EMS is subject to an annual management review in conjunction with the compilation of the AER. The EMS review outcomes are tabled at Safety Management Systems Committee Meetings and are used to update the Compliance Register and Airport Environmental Action Plan.

Previously, the complete Environmental Management Framework, including the EMS, was reviewed every five years in conjunction with the development of each new Master Plan and Environment Strategy. The last review was undertaken during the preparation of Master Plan 2020. The next review will be undertaken in 2027 as part of the development of Master Plan 2028.

EMS ACHIEVEMENTS

Over the period of the Environment Strategy 2014, a range of commitments were achieved including:

- Review and update of the JAH Environmental Management Framework; including review and update of the JAH EMS in line with the new AS/NZS ISO 14001:2015;
- Review of Tenant Environmental Handbook and promulgation of existing and updated environmental resources on the JAH website;
- Ongoing progressive OEMP development and implementation by tenants consistent with the Tenant Environmental Risk Allocation and Auditing Frequency Criteria;
- Ongoing development and implementation of CEMPs for clearing and construction projects;
- Tenant audits undertaken consistent with the Tenant Environmental Risk Allocation and Auditing Frequency Criteria. Auditing of tenants across the airport estate, ensuring compliance with JAH and regulatory environmental requirements, including the development of an OEMP;
- Implementation of the Tenant OEMP Exemption process for low risk tenants;

- Submission of all environmental reports to regulatory authorities within the specified timeframes; and
- Maintenance of the Environmental Action Plan.

TARGETS

The Environmental Management Framework, and in particular the EMS, is the means through which JAH manages the environment at the airport. The targets established in this section are not specific to one environmental factor, but instead highlight the approach that will facilitate the achievement of targets in Sections 9.7 to 9.13.

Table 9.3 Environment Management Targets

Target	Timeframe
Maintain and improve the JAH EMS, including updating relevant policies and procedures as required	Ongoing
Review Tenant Environmental Handbook.	Triennially
Promulgate staff and tenant environmental resources (policies, guidelines, Tenant Environmental Handbook etc.) on the JAH website	Ongoing
Require all tenants/projects that have the potential to cause environmental harm develop and implement an OEMP/CEMP	Ongoing
Undertake auditing of tenants consistent with the Tenant Environmental Risk Allocation and Auditing Frequency Criteria	Ongoing
Undertake environmental reporting to regulatory authorities	Annually
Maintain Compliance Register and Airport Environmental Action Plan	Annually
Review and update the JAH Environmental Management Framework	2027

9.3 ENVIRONMENTAL REGULATORY CONTEXT

JAH and its tenants have a diverse range of environmental obligations as a result of legislation, licenses, lease conditions, permits and development approvals. The key pieces of legislation controlling the environment operations at the airport are the *Airports Act 1996*, *Airports (Environment Protection) Regulations 1997* and the *Environment Protection and Biodiversity Conservation Act 1999*.

In addition, various industry codes of practice, Australian Standards and other guidelines are applicable to operations at the airport.

9.3.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the protection of the environment, especially matters of national environmental significance. Under the EPBC Act, a person must not take action that has, will have, or is likely to have a significant impact on any matters of national environmental significance without approval from the Australian Government Environment Minister.

EPBC referral 2009/4796 (Jandakot Airport Expansion, Commercial Development and Clearance of Native Vegetation, WA) was approved with conditions by the then Minister for Environment, Water, Heritage and Arts in March 2010. This approval allows for clearing of native vegetation within Precincts 1B, 3, 4 and 5 to enable expansion of commercial and aviation developments as detailed in the Master Plan 2009. The conditions of approval include the development and implementation of various management plans, including an Offset Plan, Conservation Management Plan, Construction Environmental Management Plan and Groundwater Management Plan. All of these plans have been developed and implemented.

EPBC Referral 2013/7032 (Jandakot Airport Precinct 6 and 6A) was approved by the then Department of the Environment in July 2014. This approval allowed for the clearing of native vegetation within Precincts 6 and 6A for the subsequent mixed business and aviation developments. The conditions of approval included the acquisition of offset land, the development and implementation of a Construction Environmental Management Plan and measures to protect the Jandakot Groundwater Mound. All of the conditions have been implemented and the actions of the approved referral are now complete.

9.3.2 AIRPORTS ACT 1996 AND AIRPORTS (ENVIRONMENT PROTECTION) REGULATIONS 1997

The *Airports Act 1996* and subsidiary legislation are the primary statutory controls for ongoing regulation of activities on airport land. In particular, Part 5 Division 3 Section 71(h) of the Act details the requirements of an Environment Strategy and Part 6 of the Act addresses matters resulting in environmental harm.

The *Airports (Environment Protection) Regulations 1997* detail general duty requirements of airport-lessee companies, and identify and define procedures and standards to be employed in determining the level and impact of air, water and soil pollution and excessive ground based noise. These Regulations also set out in detail the environment standards, monitoring and reporting regimes and the enforcement provisions for environmental matters specified in the Act and Regulations.

All users of Jandakot Airport have a duty under the Regulations to:

- Prevent pollution;
- Preserve
 - local biota, ecosystems and native species habitats;
 - existing aesthetic, cultural, historical, social and scientific (including archaeological and anthropological) values;
 - vulnerable or endangered flora and fauna species;
 - conservation significant vegetation;
 - sites of indigenous significance at the airport; and
- Prevent the generation of offensive noise.

9.3.3 OTHER COMMONWEALTH ENVIRONMENT AND HERITAGE LEGISLATION

Commonwealth legislation, in addition to those detailed above, which applies to the airport includes:

- *Australian Heritage Council Act 2003*;
- *Native Title Act 1993*; and
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

9.3.4 WESTERN AUSTRALIAN ENVIRONMENT AND HERITAGE LEGISLATION

Some State environmental legislation applies to Jandakot Airport under the provisions of the *Commonwealth Places (Application of Laws) Act 1970*. Regulation of environmental issues can therefore occur through State agencies in selected circumstances, typically in instances where Commonwealth legislation does not exist (i.e. waste management). Where State and Commonwealth legislation conflicts, Commonwealth legislation takes precedence.

State legislation which is applicable to the airport includes:

- *Dangerous Goods Safety Act 2004*;
- *Environmental Protection (Controlled Waste) Regulations 2004*; and
- *Aboriginal Heritage Act 1972*.

The following environment-related State Planning policies are also taken into consideration for the management and development of the airport site.

- State Planning Policy 2.3 – Jandakot Groundwater Protection Policy; and
- State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region.

9.4 REGULATORY AGENCIES

Environmental regulation of the airport is carried out by the Department of Infrastructure, Transport, Regional Development and Communications and the Department of Agriculture, Water and the Environment (DAWE).

9.4.1 DEPARTMENT OF INFRASTRUCTURE, TRANSPORT, REGIONAL DEVELOPMENT AND COMMUNICATIONS

The Airport Environment Officer (AEO) is employed by the Department of Infrastructure, Transport, Regional Development and Communications and is authorised under the Act to exercise powers regarding environmental issues conveyed through the legislation. The AEO monitors JAH's compliance with this Master Plan and Environment Strategy, and the *Airports (Environment Protection) Regulations 1997*. JAH activities are monitored and compliance communicated through regular meetings, site inspections, monitoring and reporting. In addition to this, the AEO provides advice to the Airport Building Controller in the assessment of building applications relevant to the AEO.

9.4.2 DEPARTMENT OF AGRICULTURE, WATER AND THE ENVIRONMENT

The DAWE administers the EPBC Act, under which approvals are obtained for clearing and development when matters of national environmental significance are impacted. JAH liaises with and reports to the Environmental Audit Section regarding EPBC approved projects.

9.5 ENVIRONMENTALLY SIGNIFICANT AREAS

The *Airports Act 1996* requires that the Environment Strategy identifies, in consultation with relevant Commonwealth and State conservation bodies, areas (if any) within the Airport estate as environmentally significant. No definition or guidance on the minimum requirements for 'environmentally significant' has been provided by legislation or Agency guidance. As such, regulated airports nationally have variably defined environmentally significant areas in previous Environment Strategies.

JAH has previously identified environmentally significant areas within the 2009 and 2014 Master Plans, nominating these areas as Conservation Precincts. The nominated significance was primarily due to the presence of Banksia Woodland, which provides foraging habitat for Carnaby's Cockatoos (*Calyptorhynchus latirostris*). In addition, the presence of the Grand Spider Orchid (*Caladenia huegelii*) in Precinct 1A and to a lesser extent Precinct 1B, added to the identification of these specific areas.

Reflecting the evolution of development, aviation requirements and management of Jandakot Airport, the 2014 Master Plan identified Precincts 6 and 6A as Mixed Business and Aviation Operation respectively. As required under Commonwealth legislation, the proposed development of Precincts 6 and 6A was subject to assessment, and EPBC Approval 2013/7032 resulted in the provision of offsets by JAH and measures to protect the Jandakot Groundwater Mound. The 2014 Master Plan also split the former Precinct 2 in Precincts 2A and 2B, whilst retaining the proposed use as Conservation.

JAH recognizes that the airport estate contains environmental values that are listed under Commonwealth and State legislation. Impacts proposed to listed values require consideration under applicable legislation, most notably, the EPBC Act. Defining areas as environmentally significant under the *Airports Act 1996* does not therefore afford listed natural values an increased level of protection.

9.6 ENVIRONMENTAL ASPECTS

The environmental aspects addressed in the Environment Strategy have been identified through the previous Environment Strategy (2014), environmental reviews, audits and the development of the JAH Environmental Management System.

The environmental aspects have been classified as follows:

- Soil and Water Quality;
- Air Quality;
- Biodiversity and Conservation;
- Cultural Heritage;
- Ground Based Noise;
- Water and Energy Resources; and
- Waste.

These aspects are detailed in the following Sections 9.7 through 9.13, respectively. Where relevant, each of these sections delineates:

- Objectives for management;
- The existing environment at the airport pertaining to each aspect;
- Potential impacts of airport operations on the natural environment at the airport;
- Recent achievements; and
- Targets for environmental management at the airport from 2020-2028.

9.7 SOIL AND WATER QUALITY

Objectives

- To minimise potential contamination of soil and water sources
- Manage and investigate known or potentially contaminated sites in accordance with relevant legislation

Groundwater and soil impacts are intimately linked and as such, the impacts of airport operations on groundwater and soil have been considered together. The southern and eastern parts of the airport are located within the northern boundaries of the Jandakot Groundwater Mound as shown in Figure 9.2.

9.7.1 OVERVIEW

GEOLOGY AND SOILS

The Armadale and Fremantle 1:50 000 Environmental Geology Series indicates Jandakot Airport consists of Quaternary superficial alluvial sediments, varying in thickness from around 30m to 60m. The sands unconformably overlay the older Osborne and Leederville formations, comprising of shale and siltstones.

The Swan Coastal Plain consists of a series of distinct dune systems aligned approximately north to south and extending from the coast to the Darling Scarp. The Quindalup and Spearwood dune systems lie closest to the coast, with the Bassendean dune system further to the east. Jandakot Airport lies approximately 3km east of the Spearwood system boundary, within the Bassendean dune system. Bassendean sands are aeolian, or windborne, soils derived from particles washed up by the ocean and blown by wind to form dunes. These sands are characterised as pale grey, white, medium grained, moderately sorted quartz sand with black heavy minerals scattered throughout (McArthur and Bettenay 1960).

The topography of the airport and surrounding areas is generally flat, with local variations in height of 20 m or less. Most of the site has an elevation of approximately 28-30 m AHD. High points of 40-45 m AHD occur in the south-eastern corner and within Precinct 1A.

ACID SULFATE SOILS

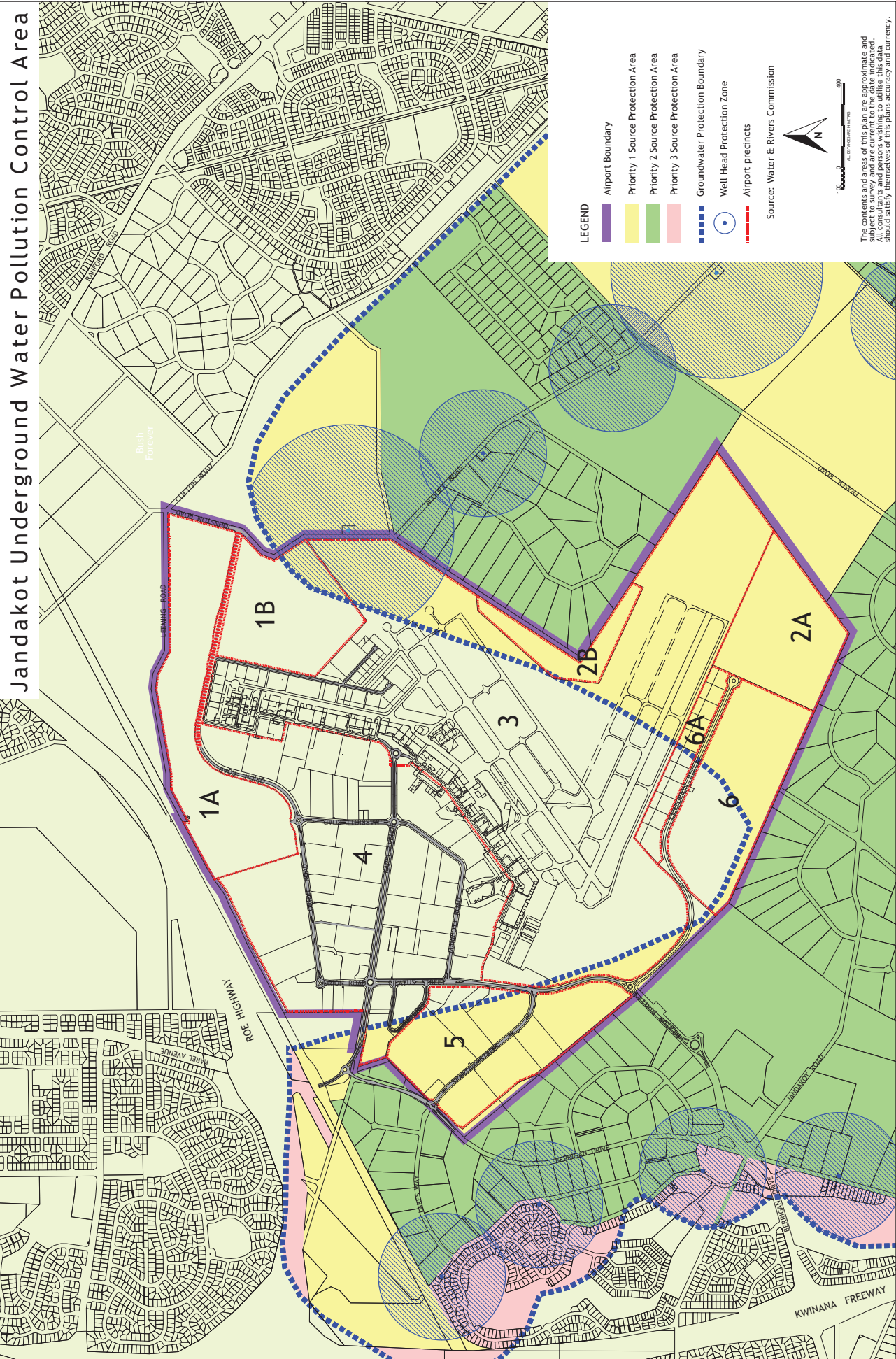
Acid sulfate soil (ASS) is the common name for soils that contain metal sulfides. In an undisturbed and waterlogged state, these soils may pose no or low risk. However, when acid sulfate soils are disturbed or exposed and react with oxygen, they produce sulfuric acid which may be accompanied by certain hazards. Metals may be released from sediments and become bioavailable in the environment, oxygen may be removed from the water column and gases such as hydrogen sulfide, sulfur dioxide and methane may be released.

Failure to appropriately manage acid sulfate soils may:

- Impact the quality of potable drinking water groundwater due to acidification and release of metals in acid sulfate soil areas and receiving waters;
- Impact the quality of groundwater extracted for non-potable purposes (i.e. irrigation); and
- Impact infrastructure and the built environment by subsidence and corrosion.

The majority of the site is located in an area of moderate to low risk of ASS occurring within 3 metres of the natural soil surface but high to moderate risk of ASS beyond 3 metres of the natural soil surface (i.e. Class 2). A small area of land in the south of the airport is categorised as 'high to moderate risk of ASS occurring within 3 metres of the natural soil surface' (i.e. Class 1) (DWER 2017).

FIGURE 9.2 - JANDAKOT UNDERGROUND WATER POLLUTION CONTROL AREA



The WA Department of Water and Environmental Regulation (DWER) has released an Acid Sulfate Soils Guideline Series containing the following:

- Identification and investigation of acid sulfate soils and acidic landscapes (DER 2015a); and
- Treatment and management of soils and water in acid sulfate soil landscapes (DER 2015b).

In line with the DWER guidelines, sites will be investigated for acid sulfate soils if any of the following are proposed:

- Soil or sediment disturbance of 100m³ or in areas depicted in an ASS risk map as Class 1;
- Soil or sediment disturbance of 100m³ or more with excavation from below the natural water table in an area depicted on an ASS risk map as Class 2; and
- Lowering of the water table, whether temporary or permanent, in areas depicted in an ASS risk map as Class 1 or Class 2.

If the initial investigation confirms the presence of ASS, an ASS Management Plan will be developed and implemented.

STORMWATER

Development increases the area of impermeable surfaces such as buildings, roads, car parks, runways and apron areas, which concentrate run-off following very intense rainfall events.

Stormwater from roofs is collected and discharged into soakwells in order to facilitate and maximise groundwater recharge.

Drainage swales and basins have been created in strategic areas of the airport to collect run-off from roads and other sealed surfaces. Due to the high permeability of the Bassendean soils, run-off is localised and short term as it generally infiltrates very quickly.

Groundwater downgradient from drainage basins adjacent to the Jandakot Underground Water Pollution Control Area, is monitored in order to ensure that water quality is not adversely impacted by stormwater management practices at the airport.

WETLANDS

Within Jandakot Airport there are no natural drainage channels or defined areas of surface water.

The two wetlands that occur on the site are both Resource Enhancement category wetlands (Damplands) as defined by the Geomorphic Wetlands of the Swan Coastal Plain dataset (DBCA 2018). Neither of these wetlands are listed on the Commonwealth Directory of Important Wetlands. These are located in Precincts 1A and 1B, both of which are areas of dieback infested bushland.

GROUNDWATER

Jandakot Airport is partially located on the northern margin of the Jandakot Groundwater Mound, with the crest of the mound located just south of the airport (Davidson, 1995).

The shallow sand aquifer covers an approximate area of 760 km², from the Swan River in the north to the Serpentine River in the south. The Jandakot Mound has primarily developed because the rate of infiltration exceeds the rate of horizontal groundwater flow through the aquifer.

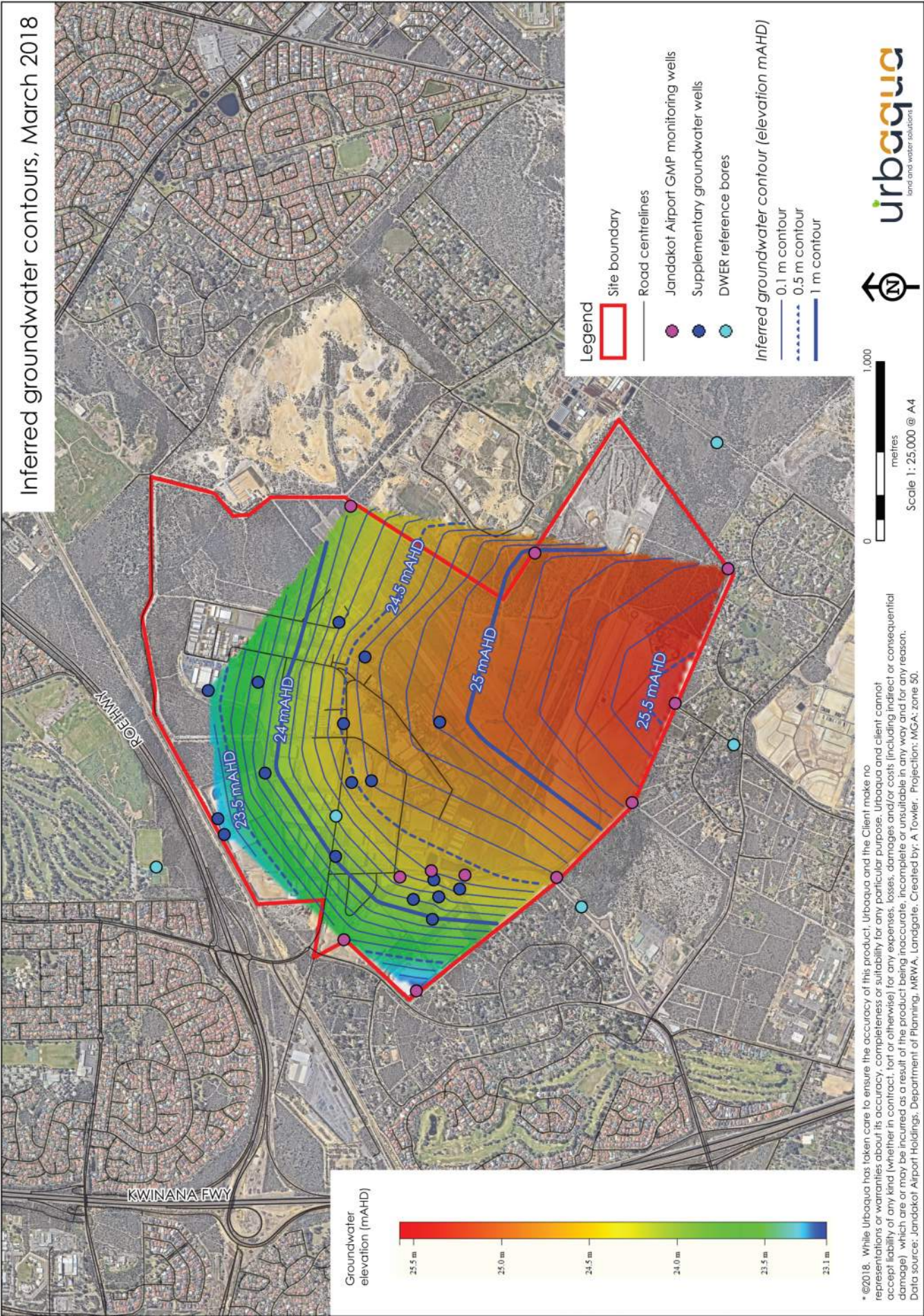
Groundwater levels at Jandakot Airport are generally shallow (23 to 26 mAHD) with little variability in the groundwater levels (generally less than 1m) throughout the year (Urbaqua 2020). Groundwater levels generally rise between June and September in response to infiltration from rainfall followed by a decline from September to June. A review of historical DWER data shows that groundwater levels in the Jandakot area have generally declined from around 1990, but have shown a marginal increase since 2010/11. This recent trend of increasing water levels is also evident within the airport.

Inferred groundwater contour mapping indicates that groundwater flows in a northerly direction over much of the airport, with a north westerly flow in some areas; notably Precinct 5 and more western areas of the airport as shown in Figure 9.3 (Urbaqua 2018).

GROUNDWATER ABSTRACTION

JAH abstracts groundwater for irrigation and construction (primarily dust suppression) purposes via a network of bores. Groundwater abstraction from the underlying superficial aquifer occurs in accordance with a license issued by the DWER. All groundwater abstraction bores are metered and water consumption rates are monitored monthly. The Jandakot Airport Groundwater Management Plan addresses the management and reporting of groundwater abstraction.

FIGURE 9.3 - JANDAKOT AIRPORT INFERRED GROUNDWATER CONTOURS



UNDERGROUND WATER POLLUTION CONTROL AREA

The Jandakot Mound is gazetted as both a Public Drinking Water Supply Area (PDWSA) and an Underground Water Pollution Control Area (UWPCA). The UWPCA defines the area of the Jandakot Mound groundwater system that provides public water supply as part of the Integrated Water Supply Scheme. The DWER manages Western Australia's water resources including the Jandakot Mound and restricts land uses that may pose a threat to the quantity or quality of water available from the mound for public water supply.

Within the Jandakot UWPCA, a three-level priority system is used; Priority 1 (P1); Priority 2 (P2) and Priority 3 (P3). In addition, Wellhead Protection Zones are used to protect underground sources of drinking water.

Portions of the airport land are within the P1 Source Protection Area of the Jandakot UWPCA, including:

- Conservation Precincts 2A, 2B and a portion of 1B;
- Portions of Precinct 4, 5, and 6/6A, which are already under development;
- Precinct 3, including existing infrastructure and portions of the proposed fourth runway and runway extension;

Existing developments at the airport that are located within the Jandakot Mound's Source Protection Area are managed in accordance with the Jandakot Airport Local Water Management Strategy and Groundwater Management Plan.

LOCAL WATER MANAGEMENT STRATEGY

The Jandakot Airport Local Water Management Strategy, initially developed in 2009 to guide development of Precinct 5, was reviewed and amended in 2015 to incorporate the development of Precincts 6 and 6A. This strategy incorporates and provides for the implementation of Water Sensitive Urban Design at the airport. Water management objectives include:

- Prevent pollution of groundwater within the JUWPCA;
- Contribute to improving the health and sustainability of the Jandakot Groundwater system;
- Provide a local drainage system with appropriate level of amenity and safety during storm events; and
- Ensure the efficient use and re-use of water resources.

POLLUTION PREVENTION AND CONTAMINATION MANAGEMENT

Hazardous substances and dangerous goods are stored and used across the airport on a daily basis. These products have the potential to cause significant environmental impacts to both soil and groundwater if they are not stored and managed correctly.

Through consultation with regulators, tenants and other stakeholders, JAH has developed a number of measures to minimise the risk of pollution occurring and ensure that the risk posed by existing contaminated sites are appropriately managed. These include:

- Implementation of the Local Water Management Strategy and Groundwater Management Plan;
- No bulk storage (i.e. manifest quantities as defined under the *Dangerous Goods Safety Act 2004* and associated regulations) of potentially polluting chemicals within the Jandakot UWPCA;
- All new developments are to be connected to deep sewer;
- All existing infrastructure to be connected to deep sewer by end of 2024 (where feasible);
- Development of Construction Environmental Management Plans, and Operational Environmental Management Plans to reduce the risk of pollution on tenant sites;
- Undertaking tenant audits and inspections;
- Training and awareness programs (e.g. site inductions, Tenant Environmental Handbook, spill response training, etc.); and
- Mandatory reporting of all spills that have the potential to result in environmental harm, regardless of volume.

All areas of confirmed or suspected contamination are reported and recorded on the JAH Contaminated Sites Register, which is a component of the Environmental Site Register. Sites are ranked according to the nature of contamination and risks posed. Where investigation identifies sites as requiring remediation or ongoing monitoring, appropriate plans are developed and implemented in line with the *Airports (Environment Protection) Regulations 1997*, National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM) and the DWER's Contaminated Sites Management Series Guidelines as appropriate. The number of contaminated sites on the Environmental Site Register has been reduced from 14 in 2009 to

eight in 2014 and six in 2020. Two sites are subjected to ongoing monitoring programmes, and one site is in the final stages of validation. The remaining sites are low risk unconfirmed contamination that will be addressed in future assessments.

Prior to the expiry, transfer or termination of a tenant lease or license, an Environmental Site Assessment is undertaken if the activities of the tenant are determined to have had the potential to result in possible soil or groundwater contamination.

GROUNDWATER MANAGEMENT

Regular groundwater monitoring is undertaken at eleven monitoring bores across the airport site under the Jandakot Airport Groundwater Management Plan monitoring programme. The groundwater monitoring programme and groundwater monitoring bore locations take into account the existing developed areas within the UWPCA, including Precinct 5 and 6/6A.

Additional groundwater and soil monitoring occurs as a component of sampling analysis plans and other ongoing monitoring programmes associated with known and suspected contaminated sites.

PFAS

Due to the historical use of fire fighting foams containing per- and poly-fluoroalkyl substances (PFAS), a risk of soil and groundwater PFAS contamination exists in areas of Jandakot Airport. Since 2012, JAH has been overseeing PFAS investigations and ongoing monitoring associated with a decommissioned fire training area. Human Health and Ecological Risk Assessments have concluded that no significant risks exist.

Additional investigations to establish existing background PFAS levels in groundwater and the sampling of other potentially impacted sites have commenced and a Preliminary Site Investigation is in progress. JAH will continue to work with relevant agencies and other responsible parties to assess and manage potential PFAS contamination risks in accordance with the PFAS National Environmental Management Plan and other guidelines.

9.7.2 ACHIEVEMENTS

Over the period of the Environment Strategy 2014, a range of commitments were achieved including:

- Acid Sulfate Soils managed and investigated in line with DWER guidelines;

- Implementation of the Jandakot Airport Local Water Management Strategy and Groundwater Management Plan, including the ongoing groundwater monitoring program;
- Amendment of the Jandakot Airport Local Water Management Strategy and Groundwater Management Plan to incorporate development of Precinct 6/6A and groundwater abstraction management;
- All new developments within Precincts 4, 5 and 6/6A are connected to sewer; and
- Progressive expansion of the sewer connection to older established airport buildings within Precinct 3.

9.7.3 TARGETS

Table 9.4 below lists proposed targets aimed at appropriate consideration and management of soil and water quality at Jandakot Airport

Table 9.4 Soil and Water Quality Management Targets

Target	Timeframe
Acid sulfate soils to be investigated and managed in line with DWER Guidelines	Ongoing
Implement the Jandakot Airport Local Water Management Strategy	Ongoing
Implement the Jandakot Airport Groundwater Management Plan	Ongoing
Continue to investigate and where appropriate monitor/remediate existing and new suspected and confirmed contaminated sites	Ongoing
All new developments in Precinct 4, 5, 6 and 6A to be constructed with connection to sewer	Ongoing
Effluent (sewage and greywater) to be disposed to sewer; with the possible exception of a few small, isolated tenants within Precinct 3 outside of the UWPCA where reticulated sewer connection is not feasibly possible	2024
Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), new facilities will install an approved ATU (applies to Precinct 3 outside of UWPCA only)	Ongoing
Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), existing facilities with septic systems will be assessed and, if warranted, instructed to upgrade to an approved ATU	2024
Continue to require all tenants/projects that have the potential to cause environmental harm develop and implement an OEMP/CEMP	Ongoing

9.8 AIR QUALITY

Objective: To minimise adverse impacts on air quality resulting from ground-based activities.

9.8.1 OVERVIEW

Jandakot Airport, being a general aviation airport, does not experience the same degree of impact on air quality as major Australian airports with larger aircraft. The main sources of air emissions at Jandakot Airport are emissions from ground based operations including ground based aircraft movement, refuelling, solvent emissions from painting, mechanical and maintenance workshop emissions, manufacturing emissions and dust.

The potential impacts from ground-based emissions at Jandakot Airport include:

- Degraded local and regional air quality;
- Impacts on human health (through population exposure to airport pollution); and
- Impacts on amenity and pollution-sensitive environment values.

The main impact on air quality during construction of new buildings at the airport is likely to be dust arising from exposed soil.

Emissions from aircraft whilst in the air are controlled by the Air Navigation (Aircraft Engine Emissions) Regulations which are the responsibility of Airservices Australia.

CLIMATE

The Bureau of Meteorology (BoM) has a weather station at Jandakot Airport, with more than 30 years of data recorded.

The Swan Coastal Plain Subregion has a Mediterranean climate. The area experiences a wide range of temperatures throughout the year, with an average maximum temperature of 24.6°C. In summer, maximum temperatures may reach 40°C, whilst in winter, minimum temperatures may reach <5°C (BoM 2020).

Rainfall tends to fall in winter, with a maximum monthly mean rainfall of 171.7 mm in July. The annual average rainfall at Jandakot Airport (1972-2018) is 819.6 mm (BoM 2020).

OZONE DEPLETING SUBSTANCES

Ozone Depleting Substances (ODS) can be present in refrigerators, air conditioning systems and fire extinguishers. The identification of ODS (except internal aircraft use) is a component of the JAH tenant audit procedure and the JAH OEMP template prompts tenants to determine whether ODS are present on site when developing their OEMP. With the exception of use within aircraft, JAH are not aware of any ODS in use at the airport. Any ODS identified on the airport will be recorded within a register and JAH will liaise with the relevant tenant(s) to require that they are phased out where feasible.

DUST

Clearing and development activities are the primary source of dust on the airport. Activities are managed with the approved CEMPs which contain dust management strategies, including:

- Suppression using non potable water and dust suppressants (e.g. dustex) where warranted;
- Hydromulching;
- Establishing temporary vegetative cover (e.g. cereal rye) to stabilise between initial clearing and lot level development stages;
- Using dust barriers to limit transport of dust off work areas, oriented to intercept prevailing winds;
- Restriction of high risk activities in unsuitable wind/ weather conditions; and
- Restriction of construction traffic to designated areas and tracks.

Dust complaints are managed as environmental incidents and investigated to ensure corrective action is taken as soon as practicably possible.

PUBLIC TRANSPORT

JAH encourages its staff and tenants to reduce vehicle use in order to reduce emissions. Following JAH's consultation with the State Government's Public Transport Authority, Transperth began operating a public bus service into Jandakot Airport in February 2013 with regular weekday services linking the airport to Murdoch Station.

AIRSHED MONITORING

Jandakot Airport is located within the regional South Lake airshed that comprises heavy industry, commercial activities, major arterial roads (including Kwinana Freeway and Roe Highway) and residential areas. The South Lake airshed is subject to the potential impacts of air pollutants, including carbon monoxide, particulate matter and photochemical smog (ozone), originating from activities within the Perth metropolitan area.

JAH utilises the ambient air quality monitoring data collected by the DWER at the South Lake (South East Metropolitan) monitoring station, which is approximately three kilometres west of the airport. Given the potential impacts of road vehicle traffic and industrial facilities on the airshed it is likely to be difficult to draw any conclusions concerning the operation of the airport on local air pollution. However, analysis of the DWER data since 2009 reveals no exceedances of the *Airports (Environment Protection) Regulations 1997* requirements.

9.8.2 ACHIEVEMENTS

Over the period of the Environment Strategy 2014, a range of commitments were achieved including:

- The inclusion of management and mitigation measure for dust control within CEMPs; and
- Ongoing adoption of the South Lake (South East Metropolitan) data for local air quality monitoring, with no exceedances of the Regulations observed.

9.8.3 TARGETS

Table 9.5 below lists proposed targets aimed at monitoring and management of air quality.

Table 9.5 Air Quality Management Targets

Target	Timeframe
Continue to require all tenants/projects that have the potential to cause environmental harm to develop and implement an OEMP/CEMP	Ongoing
Ensure all CEMPs include appropriate management actions to minimise the impacts of dust, including procedures to address dust complaints in a timely manner	Ongoing
Compliance with legislative requirements, including reporting requirements when reporting thresholds are triggered	As required
Utilise the South Lake (South East Metropolitan) monitoring station to determine ambient air quality	Annually

9.9 BIODIVERSITY AND CONSERVATION

Objective: To manage the flora and fauna within Jandakot Airport.

Jandakot Airport is subject to a range of existing and potential environmental impacts that may threaten biodiversity and conservation values. These include:

- Dieback (*Phytophthora cinnamomi*);
- Weeds;
- Feral animals and overabundant native species;
- Bushfires; and
- Changes to surrounding land use.

The Conservation Management Plan, with all of its sub plans as outlined in the Management Plans at Section 9.2.2, address these impacts for Conservation Precincts. Published on the Jandakot Airport Website, the Conservation Management Plan includes all relevant ecological mapping, including maps illustrating vegetation communities, bushland condition and significant species' habitats.

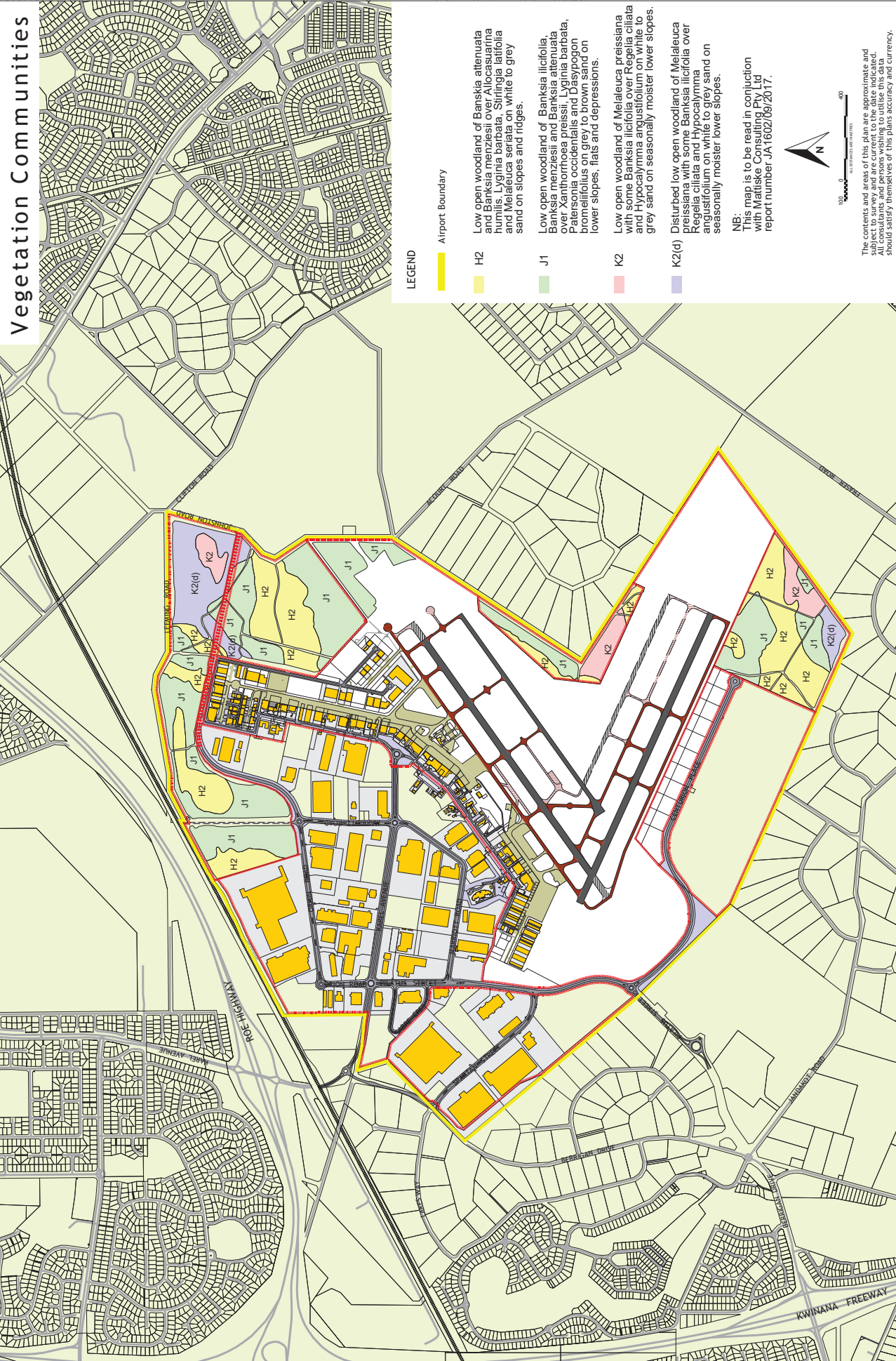
9.9.1 OVERVIEW

FLORA AND VEGETATION

Jandakot Airport is located in the Swan Coastal Plain Unit of the Drummond Botanical Subdistrict, part of the greater South-West Botanical District (Beard 1990). Under the Interim Biogeographic Regionalisation for Australia (IBRA), the airport is within the Swan Coastal Plain subregion (DoEE2017). Within the Bassendean Coastal Plain, the airport is situated on one major geomorphological system, the Bassendean Dunes (Mattiske 2017).

The Bassendean Dune System comprises vegetation on discontinuous older leached sands. This system is characterized by Banksia low woodland (*B. attenuata*, *B. menziesii*, and *B. ilicifolia*), *Eucalyptus tottiana* (to the north), *E. marginata* (to the south) and *Nuytsia floribunda* over a dense understorey of sclerophyll shrubs. Low lying areas of the Bassendean system are dominated by mixtures of *Melaleuca preissiana*, *M. raphiophylla*, *B. littoralis*, *Casuarina obesa*, *E. rudis* and/or sedges (Beard 1990).

FIGURE 9.4 - VEGETATION COMMUNITIES



VEGETATION COMMUNITIES

Four vegetation communities have been defined and mapped within the bushland of Jandakot Airport (Mattiske 2017), as shown in Figure 9.4;

- H2 - Woodland of *Eucalyptus marginata*, *Banksia attenuata* and *Banksia menziesii* over low shrubs on white to grey sand on slopes and ridges within Precincts 1A, 1B, 2A and 2B;
- J1 - Low open woodland of *Banksia ilicifolia* with *Banksia menziesii* and *Banksia attenuata* over *Xanthorrhoea preissii*, *Lyginia barbata*, *Patersonia occidentalis* and *Dasypogon bromeliifolius* on grey to brown sand on lower slopes, flats and depressions within Precincts 1A, 1B, 2A and 2B;
- K2 - Low open woodland of *Melaleuca preissiana* and some *Banksia ilicifolia* over *Regelia ciliata* and *Hypocalymma angustifolium* on white to grey sand on seasonally moister lower slopes within Precincts (similar to FCT4 and FCT5 - Gibson et al. 1994) within Precincts 1A, 2A and 2B; and
- K2 (d) - Degraded low open woodland of *Melaleuca preissiana* with some *Banksia ilicifolia* over *Regelia ciliata* and *Hypocalymma angustifolium* on white to grey sand on seasonally moister lower slopes within Precincts 1A, 1B and 2A.

Banksia Woodlands of the Swan Coastal Plain ecological community has been listed as a threatened ecological community under section 184 of the EPBC Act in the 'Endangered' category. Vegetation communities delineated and mapped (namely H2, J1 and K2) satisfy key diagnostic characteristics, condition thresholds and minimum patch sizes outlined in guidance documents relating to *Banksia* Woodlands of the Swan Coastal Plain (Mattiske 2017).

BUSHLAND CONDITION

Under the Conservation Management Plan, bushland condition has been determined to be the most appropriate and practical measure for the vegetation within Jandakot Airport's Conservation Precincts to be maintained appropriately in order to provide suitable habitat for local fauna and flora species. Bushland is maintained at levels of 'good' or above, with areas assessed as degraded triggering management intervention.

Bushland condition of the Jandakot Airport Conservation Precincts is assessed every 5 years, most recently in

2016, as a component of a grid-point survey of weeds and bushland condition (Ecoscape 2017). No significant changes were observed between the 2011 and 2016 surveys, with the majority of bushland areas in 'excellent' or 'very good' condition. In addition, bushland condition is also assessed during major vegetation assessment and mapping surveys, and was most recently completed in 2016 (Mattiske 2017). Similarly, this survey found the bushland condition to be mostly 'excellent' or 'very good'.

RARE AND ENDANGERED FLORA

Two endangered flora species protected under the EPBC Act have been previously identified as occurring within the bushland of Jandakot Airport:

- Grand Spider Orchid (*Caladenia huegelii*); and
- Glossy-leaved Hammer Orchid (*Drakaea elastica*).

Surveys by Mattiske (2010, 2013 and 2017) to identify new and previously recorded Glossy-leaved Hammer Orchids did not locate any plants and it is now suspected that it was initially misidentified and that no specimens are present on site. This is supported by the fact that the vegetation association where they were initially reported is not considered to be their typical habitat. Additionally, no declared threatened or priority flora species pursuant to the *Wildlife Conservation Act 1950* (now *Biodiversity Conservation Act 2016*) as listed by the DBCA were recorded during the 2016 survey (Mattiske 2017).

Surveys of the airport have confirmed populations of the Grand Spider Orchid at Jandakot Airport. Mattiske (2017) reported Precinct 1A as containing 390 confirmed and suspected (i.e. yet to be confirmed via photographic record of flower) plants, plus an additional 35 translocated plants, accounting for 94.9% of Grand Spider Orchid plants at Jandakot Airport. Twenty two plants have been identified in Precinct 1B and a single individual has been located in Precinct 2A.

Subsequent monitoring by JAH in 2017 - 2019 concluded that the suspected and confirmed Grand Spider Orchid population was 478 plants plus 35 translocated plants, with 95.1% of the plants being located within Precinct 1A.

JAH has consulted widely on management of the rare orchids on the airport site, including the State DBCA, DAWA, Botanic Gardens and Parks Authority and expert academics at Tertiary institutions. Management

of the Grand Spider Orchid has been undertaken in accordance with EPBC conditions of approval and detailed within the Conservation Management Plan. This included:

- The establishment of Grand Spider Orchid monitoring quadrats and a monitoring programme;
- A site wide identification and tagging program and the establishment of a detailed Grand Spider Orchid database and photographic record;
- Fencing erected and access restrictions imposed for all Conservation Precincts;
- Funding by JAH of a five-year (2010-2015) Integrated Orchid Research Programme undertaken by Botanic Gardens and Parks Authority; and
- Salvage and translocations of individual Grand Spider Orchid plants in areas impacted by approved development.

JAH will continue to liaise with relevant authorities and experts regarding ongoing management and monitoring requirements for the Grand Spider Orchid.

WEEDS

The Jandakot Airport Weed Management Plan is a component of the Jandakot Airport Conservation Management Plan.

The Weed Management Plan establishes goals and objectives, and prioritises responses to the control of weeds based on the threat posed by each species. Weed species identified at the airport are allocated a priority rating and treated accordingly during the annual weed control programme.

In addition, the Jandakot Airport Weed Management Plan sets a target of maintaining weed cover at or below 20% (consistent with definitions for 'good' bushland condition), with stable or declining weed diversity.

DIEBACK (PHYTOPHTHORA CINNAMOMI)

There are several dieback affected areas of bushland on the airport. Dieback is managed via the implementation of the Jandakot Airport Dieback Management Plan, which is a component of the Conservation Management Plan.

A dieback survey and mapping was most recently undertaken in 2017, with ongoing surveys and assessments scheduled to occur triennially. The 2017

survey confirmed the presence of the three previously identified dieback infestations, primarily associated with dampland areas. One new small infestation was identified within Precinct 1B. The boundaries of infestation were found to be relatively stable with little spread noted, indicating that dieback management measures to date have been successful.

As dieback infested areas cannot be cured, the primary management focus is to minimise its spread and prevent new infestations. The management measures that will continue to be implemented are detailed within the Dieback Management Plan, and include:

- Restricting access to dieback areas;
- Enforcing strict hygiene measures;
- Triennial dieback assessment and mapping of all Conservation Precincts; and
- Triennial Phosphite treatment.

FAUNA

Fauna is managed in accordance with the Conservation Management Plan. Fauna and fauna habitats in the Conservation Precincts of Jandakot Airport have been well surveyed and are generally well represented in the Swan Coastal Plain region. Of the vegetation communities present at the airport, the Banksia Woodland (i.e. H2 and J1) has higher value as fauna habitat because of its vegetation structure and habitat complexity, providing elements important to a variety of fauna, including foraging habitat for Carnaby's Cockatoos.

Environmental assessments have identified two EPBC-listed fauna species that are known to occur or potentially occur at Jandakot Airport (Western Wildlife 2017).

The two EPBC Act listed threatened species are:

- Carnaby's Black-cockatoo (*Calyptorhynchus latirostris*) – foraging non-breeding seasonal visitor; and
- Forest Red-tailed Black-cockatoo (*Calyptorhynchus banksii naso*) – potential foraging non-breeding occasional seasonal visitor.

Other conservation significant fauna potentially occurring at Jandakot Airport include:

- The EPBC Act listed migratory species, the Fork-tailed Swift (*Apus pacificus*) – likely to fly over the airport rather than visit and utilise habitat noting there are no records of this species at the airport or nearby;

- The Peregrine Falcon (*Falco peregrinus*) - listed under the *Biodiversity Conservation Act 2016* as 'other specially protected fauna', may potentially occur as a foraging, non-breeding visitor.

Eight Priority Species listed by DBCA that occur, or potentially occur, at Jandakot Airport are:

- Perth Lined Lerista (*Lerista lineata*) – a Priority 3 species previously recorded;
- Jewelled Ctenotus (*Ctenotus gemmula*) - a Priority 3 species not previously recorded;
- Black-striped Snake (*Neelaps calonotos*) - a Priority 3 species previously recorded;
- Western False Pipistrelle (*Falsistrellus mackenziei*) - a Priority 4 species not previously recorded;
- Western Brush Wallaby (*Notamacropus irma*) - a Priority 4 species present in Precinct 1A, 1B and 2A;
- Quenda (*Isodon fusciventer*) - a Priority 4 species common throughout much of the airport, including developed areas;
- Graceful Sun-moth (*Synemon gratiosa*) - a Priority 4 species previously recorded; and
- Katydid or Bush Cricket (*Throscodectes xiphos*) - a Priority 1 species not previously recorded.

Management measures to address potential impacts on fauna during approved clearing and development are addressed within the Construction Environmental Management Plan and the Conservation Management Plan. Monitoring and survey requirements for species of conservation significance specified under EPBC conditions of approval, as well as thresholds for triggering management intervention, are also detailed within the Conservation Management Plan.

EPBC Act conditions of approval require the development of a Wildlife Fencing and Underpass Strategy, which is being implemented. The Fencing and Underpass Strategy aims to find a balance between maintaining wildlife corridors to facilitate terrestrial wildlife movement wherever possible, and the use of fencing and other barriers to prevent wildlife accessing areas where they may be harmed (and cause harm).

FERAL ANIMALS AND OVERABUNDANT NATIVE SPECIES

It is recognised that feral animal management within remnant bushland in an urban setting is a complex task, especially when there is increasing pressure from surrounding urban development and neighbouring properties are subjected to differing (or no) feral management practices. JAH has developed a Feral Animal Management Plan that addresses management of feral animals that may potentially occur at the airport, including foxes, cats, rabbits and bees.

The Feral Animal Management Plan also addresses management methods for domestic animals as well as potential overabundant native species.

Macropods (wallabies and kangaroos) as well as bird species may be considered overabundant native species in certain areas of the airport. Management methods are detailed within the Conservation Management Plan and Feral Animal Management Plan.

9.9.2 ACHIEVEMENTS

Over the period of the Environment Strategy 2014, JAH successfully implemented the Conservation Management Plan. In doing so, key achievements included:

- Undertaking weed and bushland condition surveys and maintaining bushland condition at 'and above 'good';
- Ongoing management and monitoring of the *C. huegelii* population, including annual monitoring of research quadrats, monitoring translocated individuals and undertaking a comprehensive census of the Jandakot Airport population to demonstrate a stable population;
- Participation in the annual Great Cocky Count;
- Successfully relocating significant fauna from bushland areas prior to clearing and development, including collaboration with Tertiary institutions on research and radio tracking of translocated wallabies;
- Establishing fauna linkages between Jandakot Airport and neighbouring Jandakot Regional Park; and
- Completion of triennial dieback assessment and mapping.

9.9.3 TARGETS

Table 9.6 below lists proposed targets to ensure conservation and biodiversity values are appropriately considered and managed at Jandakot Airport.

Table 9.6 Biodiversity and Conservation Management Targets

Target	Timeframe
Implement the CMP (including Appendices/Sub-plans)	Ongoing as detailed within CMP
Undertake review of CMP and its associated appendices	Every 5 years (i.e. 2023 or earlier if required)

9.10 CULTURAL HERITAGE

Objective: To minimise the impact of airport development on cultural heritage and manage sites in accordance with applicable legislative requirements.

9.10.1 OVERVIEW

EUROPEAN HERITAGE

Jandakot was utilised for grazing activities from 1867. Experienced vegetable and orchard gardeners were attracted to the Cockburn region when Fremantle and Perth grew rapidly due to Western Australia's gold rush. Rural housing developments commenced in the post war years and Jandakot Airport opened in 1963 following closure of the Maylands airfield. No European heritage sites have been registered within the City of Cockburn Local Government Inventory and Heritage List, the State Heritage Register or the Commonwealth Heritage List. There are also no visible signs of European heritage on site.

INDIGENOUS HERITAGE

Prior to the approval of the Jandakot Airport Master Plan 2009, JAH engaged Australian Interaction Consultants (AIC 2008) to undertake an Ethnographic and Archaeological Site Identification Survey of the areas to be impacted under the Jandakot Airport Master Plan 2009. The project area included the entire airport as well as some neighbouring properties.

Archival research revealed two sites (artefact scatters) which were believed to be within the airport boundary; Site 4309 Princep Road and Site 3513 Lukin Swamp. Several other sites were located on neighbouring properties.

The survey included liaison with the then WA Department of Aboriginal Affairs (now Department of Planning, Lands and Heritage), review of previously conducted surveys in the vicinity of the airport and an archaeological survey and an ethnographic survey involving the representatives of relevant Aboriginal groups. AIC concluded:

- No new ethnographic or archaeological sites were identified;
- A Cultural Heritage Management Plan should be developed;
- There is potential for intact archaeological deposits which may contain cultural materials in undisturbed areas of Jandakot Airport and monitoring of ground disturbing activities is recommended;
- Previously identified Site 4309 Princep Road is no longer a site within the meaning of Section 5 of the Aboriginal Heritage Act 1972;
- DIA 3513 Lukin Swamp could not be located within Jandakot Airport; and
- At this time, a Section 18 application is not required for the Jandakot Airport Master Plan to proceed.

JAH has a Cultural Heritage Management Plan for managing heritage values at the airport. Developed utilising the findings of AIC, the purpose of this plan is to ensure that JAH conducts its developments in a manner that complies with the *Airports Act 1996* and other statutory requirements in relation to areas of Aboriginal cultural significance.

9.10.2 ACHIEVEMENTS

Over the period of the Environment Strategy 2014, a range of commitments were achieved including:

- The implementation of a Cultural Heritage Management Plan (reviewed in 2018) as a component of the Jandakot Airport Conservation Management Plan; and
- Ongoing monitoring of clearing and earth disturbance activities by construction personnel for potential archaeological artefacts.

9.10.3 TARGETS

Table 9.7 below lists proposed targets for appropriate consideration and management of cultural heritage matters at Jandakot Airport.

Table 9.7 Cultural Heritage Management Targets

Target	Timeframe
Review and update Cultural Heritage Management Plan	2023
Monitor clearing and earth disturbance for Aboriginal and European heritage by construction personnel	Ongoing as required - during all clearing and earth disturbance works

9.11 GROUND BASED NOISE

Objective: To manage noise associated with construction and ground-based airport operations in accordance with applicable legislative requirements.

9.11.1 OVERVIEW

The *Airports (Environment Protection) Regulations 1997* apply to noise derived from tenant and construction operations. The Regulations, and therefore the Environment Strategy do not directly apply to noise generated by aircraft except for ground running, which is covered by the *Air Services Act 1995*, the *Air Navigation (Aircraft Energy Emissions) Regulations* and *Air Navigation (Aircraft Noise) Regulations*, and administered by Airservices Australia. Noise from aircraft is addressed in detail in Section 8.2.

Potential sources of ground based noise at the airport include:

- Construction and demolition activities;
- Aircraft maintenance and ground running;
- Tenant activities;
- Vehicle and plant use (including road traffic); and
- Maintenance.

These sources of ground based noise can potentially cause nuisance to airport operators and the community, including neighbouring residents.

MONITORING AND MANAGEMENT

Tenant Operational Environmental Management Plans are required to address noise management for tenants that are assessed as having an inherent environmental risk of 'Moderate' or greater, as defined by the Tenant Environmental Risk Allocation and Auditing Frequency Criteria.

Construction activities are required to be undertaken in accordance with an approved Construction Environmental Management Plan, which must include noise management measures.

Due to the relatively benign land uses proposed in the commercial precincts (office, storage and warehouse) it is unlikely that there will be any significant noise impacts created offsite. The majority of the commercial precincts are remote from residential areas, and where they adjoin rural-residential areas or where particularly noisy activities are proposed to be located on the airport, noise mitigation measures will be considered.

Noise complaints received by JAH are managed as environmental incidents and are documented and investigated. This process allows for corrective actions to be identified and implemented.

Should there be complaints regarding ongoing excessive ground based noise, noise monitoring may be undertaken. This monitoring will be undertaken in accordance with the *Airports (Environment Protection) Regulations 1997* and the relevant Australian Standards.

9.11.2 ACHIEVEMENTS

Over the period of the Environment Strategy 2014, a range of commitments were achieved including:

- A Construction Environment Management Plan detailing noise mitigation measures is required for all construction activities that have the potential to result in noise impacts;
- Tenants that undertake operations that have the potential to create noise impacts are required to develop an Operational Environment Management Plan; and
- All ground based noise complaints were managed as environmental incidents and resolved in a timely manner.

9.11.3 TARGET

Table 9.8 below lists proposed targets aimed at ensuring that ground based noise is appropriately managed at Jandakot Airport.

Table 9.8 Ground Based Noise Management Targets

Target	Timeframe
Require that CEMPs are developed for all significant construction activities and incorporate measures to mitigate the potential impacts of noise	Ongoing as required
Require that OEMPs developed by tenants incorporate measures to mitigate the potential impacts of noise	Ongoing as required
All ground based noise complaints will be managed as environmental incidents and appropriately investigated in a timely manner	Ongoing as required

9.12 WATER AND ENERGY RESOURCES

Objective: To manage and monitor water and energy consumption at Jandakot Airport.

9.12.1 OVERVIEW

Water and most sources of energy are derived from limited resources. Jandakot water supply is provided by both scheme and groundwater. Irrigation is largely supplied from groundwater with some areas supplied from reclaimed wastewater or scheme water.

All electricity is provided via mains power. JAH provides electricity and scheme water to all tenants and monitors consumption across the airport.

SCHEME WATER

Table 9.9 below shows the annual scheme water consumption at Jandakot Airport since Master Plan 2014:

Table 9.9 Annual Scheme Water Consumption since 2015/16

Reporting Period					
	2015/16	2016/17	2017/18	2018/19	2019/20
Scheme Water Consumption (kL)	254,353	212,470	198,377	202,072	245,856

As predicted within Environment Strategy 2014, scheme water consumption has generally increased as development has increased. A decrease in water consumption from 2015/16 levels is likely associated with a temporary reduction in the rate of construction activities, however the long term trend is expected to demonstrate increasing consumption as development continues to increase and additional tenants become established and operational.

WATER EFFICIENCY MANAGEMENT PLAN

In consultation with the Water Corporation, Western Australia's largest water and wastewater services provider, JAH developed a Water Efficiency Management Plan in 2008. Following five years of implementation, the plan was reviewed and updated in 2013 and a benchmark of 0.28 kL per m² of leased developed area was set. JAH has achieved this benchmark since 2014/15.

In 2018, JAH was able to demonstrate, via increased sub-metering throughout the airport and reduced water consumption, that neither JAH nor any single tenant utilised greater than 20,000 kL of water per annum. As a consequence, JAH is now exempt from Water Corporation WEMP reporting obligations, although individual tenants that exceed 20,000 kL of water per annum may be required to develop a WEMP. However JAH still maintains a WEMP, most recently updated in 2018, and has committed to providing ongoing informal annual reporting to Water Corporation.

GROUNDWATER ABSTRACTION

JAH recognises that sound management of groundwater abstraction is essential to ensure that the water resources are available to all consumers, including Jandakot Airport.

JAH abstracts groundwater for irrigation and construction (primarily dust suppression) purposes via a network of bores. All groundwater abstraction bores are metered and water consumption rates are monitored monthly.

JAH has previously consulted with the DWER regarding management of groundwater resources and groundwater abstraction. All abstraction occurs under a conditioned license issued by the DWER, and JAH provides the DWER with annual reports detailing groundwater abstraction volumes and groundwater quality monitoring results.

The Jandakot Airport Groundwater Management Plan was amended in 2015 to include the management and reporting of groundwater abstraction.

ENERGY CONSUMPTION

Table 9.10 below shows the annual electricity consumption at Jandakot Airport during the implementation of Environment Strategy 2014.

Table 9.10 Annual Electricity Consumption since 2015/16

Reporting Period					
	2015/16	2016/17	2017/18	2018/19	2019/20
Electricity Consumption (kWh)	22,281,284	24,951,477	24,672,533	26,759,284	27,650,476

Electricity consumption has increased at Jandakot Airport as development has increased and will likely continue to do so during the implementation of Master Plan 2020. To address the ongoing increase, JAH will continue to investigate alternative energy options, such as solar power, at Jandakot Airport.

Tenant electricity use is metered and monitored. Tenants that use large volumes of natural resources (including electricity) are required to manage potential impacts via an Operational Environment Management Plan.

9.12.2 ACHIEVEMENTS

Over the period of the Environment Strategy 2014, a range of commitments were achieved including:

- WEMP implemented and benchmark achieved annually since 2014/15;
- Energy, scheme water and groundwater usage by JAH and airport tenants is metered and monitored;
- Amendment of the Jandakot Airport Local Water Management Strategy and amendment of Groundwater Management Plan to incorporate development of Precinct 6/6A and groundwater abstraction management;
- All statutory reporting to regulatory authorities requirements for energy and water usage has occurred within the specified timeframes;
- Water efficiency guidance has been updated within the Tenant Environmental Handbook; and
- Implementation of airfield lighting upgrade, incorporating energy efficient LED lighting.

9.12.3 TARGETS

Table 9.11 below lists proposed targets aimed at appropriate management of water and energy consumption at Jandakot Airport.

Table 9.11 Water and Energy Resource Management Targets

Target	Timeframe
Incorporate Ecologically Sustainable Design principles into new developments	Ongoing
Implement the Jandakot Airport Water Efficiency Management Plan	Ongoing
Review and amend the Jandakot Airport Water Efficiency Management Plan	2023 (or as agreed with Water Corporation)

Target	Timeframe
Monitor water usage at the airport	Monthly (groundwater) Every two months (scheme water)
Report on water usage at the airport	Annually
Monitor energy usage at the airport	Monthly
Report on energy usage at the airport	Annually

9.13 WASTE

Objective: To facilitate the storage and appropriate disposal of waste where possible.

9.13.1 OVERVIEW

Solid waste streams include construction and demolition waste, commercial waste from airport operations and tenants and putrescible waste from services such as aircraft maintenance facilities and flight schools which include accommodation. Liquid waste is also generated by airport operations and commercial tenants. Traditionally, effluent from the airport has been disposed onsite via septic tanks and aerobic treatment units. Hazardous liquid waste, which include chemical and hydrocarbon waste, is transported and disposed in accordance with the *WA Environmental Protection (Controlled Waste) Regulations 2004*.

Inappropriate storage, transport and disposal of hazardous and non-hazardous waste can negatively impact soil and groundwater quality, ambient air quality and climate change. JAH recognises that waste management processes need to be managed to reduce negative impacts. This includes ensuring that waste streams do not exacerbate bird or animal hazards.

EFFLUENT DISPOSAL

Deep sewage, linked to the local municipal sewer system, has been connected to Jandakot Airport. This system currently services all new commercial developments well as some of the established areas of the airport.

Older established areas of the airport will continue to be progressively linked to sewer in coming years. The majority of pre-existing small tenants continue to operate septic tanks. Larger pre-existing tenants have aerobic treatment units. In line with the Master Plan 2014, JAH has committed to connecting all facilities to sewage by 2024 where feasible.

Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), new facilities will install an approved aerobic treatment unit and operate that system until a reticulated sewer connection is installed by JAH. This exception applies only to aviation operations within Precinct 3.

Where disposal of effluent to sewer is not feasible or possible for existing facilities within Precinct 3 with septic systems, facilities will be assessed and, if warranted, instructed to upgrade to an approved aerobic treatment unit.

SOLID NON-HAZARDOUS WASTE DISPOSAL AND RECYCLING

The airport is serviced by the City of Cockburn's waste services, which is coordinated by JAH. The majority of tenants participate in this user-pays program which supplies 240 L general waste mobile garbage bins to tenants for a fee per bin, with an additional 240 L co-mingled recycling mobile garbage bin offered free of charge for each general waste bin. Both bins are emptied weekly by the Cockburn City Council. Whilst the total number of bins has remained relatively stable over recent years, the proportion of bins used for recycling has marginally increased from 35% to 39%.

Other tenants, particularly those that produce large weekly waste volumes that require receptacles greater than 240 L, have alternative means of non-hazardous general and recyclable rubbish disposal via direct contracts negotiated with other licensed service providers.

INDUSTRIAL AND HAZARDOUS WASTE DISPOSAL

Any tenant proposing to discharge trade or industrial liquid waste into the sewer system must obtain a trade waste permit from the WA Water Corporation. This applies to waste water from wash bays and grease traps. Liquid wastes are not permitted to enter stormwater drains or soak into soil where it may enter the groundwater. Where connections to sewer are not available (i.e. established areas of Precinct 3 aviation operations), on-site discharge of wash water may be permitted where:

- Written justification is provided by the tenant;
- A risk assessment has been undertaken;
- An approved treatment system is installed;

- The washing facility is approved via a development application and/or a building permit; and
- The activity is detailed in an endorsed Operational Environment Management Plan, including maintenance, monitoring and reporting requirements.

All volumes of controlled waste (i.e. tyres, asbestos, oils, batteries and other potentially hazardous waste) is to be managed in accordance with relevant legislation, in particular *Environmental Protection (Controlled Waste) Regulations 2004*. Controlled waste can only be disposed of by licensed waste contractors, and relevant records must be maintained.

To assist with the disposal of controlled waste, JAH coordinates waste 'wet-cell' battery collections for recycling. This service is promulgated to all airport tenants 1-2 times per year to coincide with scheduled collection dates, although JAH staff will collect waste batteries from tenants outside of these designated days upon request.

MONITORING AND MANAGEMENT

Unlike major airports where waste generation and recycling is centred around a central passenger terminal which in turn forms the basis of waste monitoring programs, Jandakot Airport has no central waste management facility.

Tenants that generate large volumes of general waste and/or volumes of controlled waste are required to develop an Operational Environment Management Plan in which waste management practices are detailed. Tenant waste storage and disposal practices are monitored through regular tenant audits.

9.13.2 ACHIEVEMENTS

Over the period of the Environment Strategy 2014, a range of commitments were achieved including:

- All new developments within Precincts 4, 5, 6 and 6A are connected to sewer;
- Progressive expansion of the sewer connection to older established airport buildings within Precinct 3; and
- Inclusion of waste management and mitigation measures in Construction Environmental Management Plans and tenant Operational Environmental Management Plans.

9.13.3 TARGETS

Table 9.12 below lists proposed targets for waste management at Jandakot Airport.

Table 9.12 Waste Management Targets

Target	Timeframe
All new developments in Precinct 4, 5, and 6/6A, to be constructed with connection to sewer	Ongoing
Effluent (sewage and greywater) to be disposed to sewer; with the possible exception of a few small, isolated tenants within Precinct 3 outside of the UWPCA where reticulated sewer connection is not feasibly possible	2024
Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), new facilities will install an approved ATU	Ongoing
Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), existing facilities with septic systems will be assessed and, if warranted, instructed to upgrade to an approved ATU (applies to Precinct 3 outside of UWPCA only)	2024
Require that OEMP's developed by tenants incorporate measures to manage and mitigate the potential impacts of waste	<i>Ongoing as required</i>
Require that CEMP's are developed for all significant construction activities and incorporate measures to manage and mitigate the potential impacts of waste	<i>Ongoing as required</i>

10. STAKEHOLDER CONSULTATION

10.1 CONSULTATION STRATEGY

The successful development of Jandakot Airport depends on productive interaction with the wide range of stakeholders who are impacted by, and who impact, the development of the airport.

Prior to the preparation of this Master Plan, JAH prepared a consultation strategy to guide the consultation process and to ensure that all stakeholders had the opportunity to contribute to the preparation of the document. This consultation strategy had regard to the 'Airport Development Consultation Guidelines', released in October 2012 by the then Department of Infrastructure and Regional Development, which provides recommendations for the consultation to be undertaken as part of the master plan process. The Guidelines state that an effective consultation program does not necessarily mean that all interested parties will be satisfied with the outcomes, but rather, that it is about ensuring that a proposal has been fully explored, concerns identified and alternatives considered. The consultation strategy also ensured that the relevant requirements under the *Airports Act 1996* were met.

10.2 STAKEHOLDER CONSULTATION

All of the Jandakot Airport master plans have involved consultation with a wide range of stakeholders, including State and Local Government, airport tenants, aircraft operators, and community groups.

JAH has continued active engagement with stakeholders during the period of the current Master Plan 2014 and during the development of this Master Plan 2020. This ongoing consultation includes JAH participation in the following forums:

- Jandakot Airport Community Aviation Consultation Group (quarterly)
- Perth Airports Municipalities Group (quarterly)
- Jandakot Regional Park Community Advisory Committee (quarterly)
- Jandakot Chief Flying Instructor and Chief Pilots Meeting (quarterly)

10.3 PRELIMINARY CONSULTATION

The development of the Preliminary Draft Master Plan 2020 involved consultation with a wide range of stakeholders at various levels and stages.

The following agencies and organisations were directly engaged in the development of the Preliminary Draft Master Plan:

- Department of Infrastructure, Transport Regional Development and Communications (Commonwealth)
- Department of Agriculture, Water and the Environment (Commonwealth)
- Main Roads WA (State)
- Water Corporation (State)
- City of Cockburn (Local)
- Airservices Australia
- Civil Aviation Safety Authority

The Jandakot Airport Community Aviation Consultation Group, which comprises representatives from Federal, State and Local Governments, Airservices Australia, aircraft operators, and local community organisations, has been kept informed about the program and contents of this Master Plan.

Stakeholder workshops were held with aviation operators to review the proposed airfield layout and operations.

Briefing sessions were also held in March 2018 with State and Local Government agencies, airport tenants and community and resident groups.

10.4 FORMAL PUBLIC COMMENT PERIOD

In accordance with Section 79 of the *Airports Act 1996*, the Preliminary Draft Master Plan was made available for public comment for a period of 60 business days.

- An advertisement was placed in The West Australian newspaper on Wednesday, 17 March 2021 (average weekday readership 339,000) advising that the Preliminary Draft Master Plan was available for public comment until Tuesday, 15 June 2021;
- Printed copies of the Preliminary Draft Master Plan were available for viewing and purchase from the JAH Airport Management Centre during the public comment period;

- The Preliminary Draft Master Plan was published on the Jandakot Airport website for viewing and download, free of charge. During the public comment period there were a total of 1130 unique views of the website pages publishing the Preliminary Draft Master Plan.

As required by the Airports Act, written notice of JAH's intention to give the Minister for Infrastructure, Transport and Regional Development a Draft Master Plan 2020 for his consideration was sent to:

- WA Minister for Transport; Planning;
- Western Australian Planning Commission;
- City of Canning;
- City of Cockburn; and
- City of Melville.

Under the Act, any comments received during the public comment period must be considered by JAH. Following the public comment period, JAH has reviewed and assessed all comments, and where appropriate, changes were made to the Preliminary Draft Master Plan.

10.5 SUBMISSION OF DRAFT MASTER PLAN TO THE MINISTER

After public comments were received and considered, the Preliminary Draft Master Plan was prepared as a Draft Master Plan which was then submitted to the Commonwealth Minister for Infrastructure, Transport and Regional Development on 23 June 2021 for approval.

In accordance with Section 79 of the Act, the submission of the Draft Master Plan to the Minister was accompanied by the following material:

- Copies of any comments received during the public comment period; and
- A written certificate signed on behalf of JAH containing:
 - a list of names of the people or organisations that provided written comments to the Draft Master Plan.
 - a summary of the comments received.
 - evidence that JAH has given due regard to those comments.

10.6 PUBLICATION OF THE FINAL MASTER PLAN

Master Plan 2020 was approved by the Minister for Infrastructure, Transport and Regional Development, the Hon. Barnaby Joyce, on 22 August 2021.

In accordance with Section 86 of the Act, JAH undertook the following notifications upon approval of the Master Plan:

- Published newspaper notices advising that the Master Plan has been approved;
- Made copies of the approved Master Plan available for inspection in person at the Jandakot Airport Management Centre; and
- Made a copy of the approved Master Plan available on the Jandakot Airport website.

11. IMPLEMENTATION

The concept outlined in this Master Plan represents current views of expected development at Jandakot Airport.

11.1 FURTHER APPROVALS

Development approval requirements for Jandakot Airport are administered under the *Airports Act 1996*. Approval of the master plan does not necessarily constitute approval of the proposed developments. The *Airports Act 1996*, and associated regulations, requires further assessment and approval processes to occur, including the preparation of major development plans if applicable and building permits from the Airport Building Controller.

11.1.1 MAJOR DEVELOPMENT PLAN

Major development plans (MDPs) will be required for designated major airport developments, as set out in Section 88 of the Act. Such development proposals are the subject of further community consultation, environmental assessment and Ministerial approval.

Section 91 of the Act requires an MDP to be consistent with the final master plan for the airport, and requires that the MDP include the following:

- The airport-lessee company's objectives for the development;
- The airport-lessee company's assessment of the extent to which the future needs of civil aviation users of the airport, and other users of the airport, will be met by the development;
- A detailed outline of the development;
- Whether or not the development is consistent with the commonwealth airport lease for the airport;
- Whether or not the development is consistent with the final master plan;
- If the development could affect flight paths or noise exposure levels at the airport, and the effect that the development would be likely to have on those levels;
- If the development could affect flight paths at the airport, and the effect that the development would be likely to have on those flight paths;
- The airport-lessee company's plans developed following consultations with the airlines that use the airport, local government bodies in the vicinity of the

airport and—if the airport is a joint user airport—the Defence Department, for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels;

- The likely effect of the proposed developments on traffic flows at the airport and surrounding the airport, employment levels at the airport, and the local and regional economy and community, including an analysis of how the proposed developments fit within the local planning schemes for commercial and retail development in the adjacent area; and
- The assessment of the environmental impacts that might reasonably be expected to be associated with the development and the airport lessee company's plans for dealing with these environmental impacts.

11.1.2 DEVELOPMENT APPROVAL

Prior to a third party commencing new development on airport, alterations to an existing facility, or a change in use of an existing facility, a formal consent for the works is required from JAH in the form of a Development Approval. Applications for Development Approval are required to comply with the Jandakot Airport Leasing and Development Guidelines.

11.1.3 BUILDING PERMIT

Once Development Approval is granted by JAH, a Building Permit must be obtained from the Airport Building Controller (ABC) under the provisions of the *Airports Building Control Regulations 1996*. The ABC is also advised by the Airport Environmental Officer (AEO). Both the ABC and AEO are independent of Jandakot Airport and are respectively contracted to, and employed by the Department of Infrastructure, Transport, Regional Development and Communications. As part of the Building Permit process consent from Jandakot Airport must also be obtained. This consent ensures that the proposed works are in line with the Master Plan and an MDP if required.

11.2 IMPLEMENTATION

The implementation of the Master Plan will require flexibility to take into account fluctuations in economic activity and aviation requirements. Planning by its nature is a dynamic activity requiring continuous review.

Jandakot Airport is committed to providing its tenants with the aviation facilities identified in this Master Plan in a timely manner.

11.3 REVIEW

The Act provides for the final master plan to remain in force for eight years. Consequently, this Master Plan will be again reviewed and replaced in 2028. The Act also provides that an existing approved master plan remains in force until a new master plan is approved, and includes provisions for minor amendments to the master plan, and for the Minister to direct another master plan to be prepared.

APPENDIX A – AIRPORTS ACT 1996 AND AIRPORTS REGULATIONS 1997 REQUIREMENTS

AIRPORTS ACT 1996 Section 70	
(2) The purposes of a final master plan for an airport are:	Chapters 1 and 5
(a) to establish the strategic direction for efficient and economic development at the airport over the planning period of the plan;	
(b) to provide for the development of additional uses of the airport site;	Chapters 3 and 5
(c) to indicate to the public the intended uses of the airport site;	Chapters 3, 4 and 5
(d) to reduce potential conflicts between uses of the airport site, and to ensure that uses of the airport site are compatible with the areas surrounding the airport;	Chapters 3, 4, 5 and 8
(e) to ensure that all operations at the airport are undertaken in accordance with relevant environmental legislation and standards;	Chapter 9
(f) to establish a framework for assessing compliance at the airport with relevant environmental legislation and standards;	Chapter 9
(g) to promote the continual improvement of environmental management at the airport.	
Chapter 9	
AIRPORTS ACT 1996 Section 71	
(a) the airport-lessee company's development objectives for the airport;	Chapters 1, 4 and 5
(b) the airport-lessee company's assessment of the future needs of civil aviation users of the airport, and other users of the airport, for services and facilities relating to the airport;	Chapter 4
(c) the airport-lessee company's intentions for land use and related development of the airport site, where the uses and developments embrace airside, landside, surface access and land planning/zoning aspects;	Chapters 5 and 6
(d) an Australian Noise Exposure Forecast (in accordance with regulations, if any, made for the purpose of this paragraph) for the areas surrounding the airport;	Chapter 8
(da) flight paths (in accordance with regulations, if any, made for the purpose of this paragraph) at the airport;	Chapter 8
(e) the airport-lessee company's plans, developed following consultations with the airlines that use the airport and local government bodies in the vicinity of the airport, for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels;	Chapter 8
(f) the airport-lessee company's assessment of environmental issues that might reasonably be expected to be associated with the implementation of the plan;	Chapter 9
(g) the airport-lessee company's plans for dealing with the environmental issues mentioned in paragraph (f) (including plans for ameliorating or preventing environmental impacts);	Chapter 9
(ga) in relation to the initial period of the master plan--a plan for a ground transport system on the landside of the airport that details:	Chapter 6
(i) a road network plan;	
(ii) the facilities for moving people (employees, passengers and other airport users) and freight at the airport;	Chapter 6
(iii) the linkages between those facilities, the road network and public transport system at the airport and the road network and public transport system outside the airport;	Chapter 6
(iv) the arrangements for working with the State or local authorities or other bodies responsible for the road network and the public transport system;	Chapter 6
(v) the capacity of the ground transport system at the airport to support operations and other activities at the airport;	Chapter 6
(vi) the likely effect of the proposed developments in the master plan on the ground transport system and traffic flows at, and surrounding, the airport;	Chapter 6
(gb) in relation to the initial period of the master plan--detailed information on the proposed developments in the master plan that are to be used for:	Chapters 1 and 5
(i) commercial, community, office or retail purposes;	
(ii) for any other purpose that is not related to airport services;	Chapter 3

(gc) in relation to the initial period of the master plan--the likely effect of the proposed developments in the master plan on:	Chapters 1 and 5
(i) employment levels at the airport;	
(ii) the local and regional economy and community, including an analysis of how the proposed developments fit within the planning schemes for commercial and retail development in the area that is adjacent to the airport;	Chapters 2 and 3
(h) in relation to the initial period of the master plan--an environment strategy that details: the airport-lessee company's objectives for the environmental management of the airport;	Chapter 9
(ii) the areas (if any) within the airport site which the airport-lessee company, in consultation with State and Federal conservation bodies, identifies as environmentally significant;	Chapter 9 (9.5)
(iii) the sources of environmental impact associated with airport operations;	Chapter 9
(iv) the studies, reviews and monitoring to be carried out by the airport-lessee company in connection with the environmental impact associated with airport operations;	Chapter 9
(v) the time frames for completion of those studies and reviews and for reporting on that monitoring;	Chapter 9
(vi) the specific measures to be carried out by the airport-lessee company for the purposes of preventing, controlling or reducing the environmental impact associated with airport operations;	Chapter 9
(vii) the time frames for completion of those specific measures;	Chapter 9
(viii) details of the consultations undertaken in preparing the strategy (including the outcome of the consultations);	Chapters 9 and 10
(ix) any other matters that are prescribed in the regulations;	Chapter 9
(j) such other matters (if any) as are specified in the regulations.	Chapter 9

Matters provided by Regulations:	
AIRPORTS REGULATIONS 1997 – Reg 5.02 – Contents of draft or final master plan-general	
(1) For paragraphs 71 (2) (j) and (3) (j) of the Act, the following matters are specified:	Chapter 8
(a) any change to the OLS or PANS-OPS surfaces for the airport concerned that is likely to result if development proceeds in accordance with the master plan;	
(b) for an area of an airport where a change of use of a kind described in subregulation 6.07 (2) of the <i>Airports (Environment Protection) Regulations 1997</i> is proposed:	Chapter 9
(i) the contents of the report of any examination of the area carried out under regulation 6.09 of those Regulations;	
(ii) the airport-lessee company's plans for dealing with any soil pollution referred to in the report.	Chapter 9
(2) For section 71 of the Act, an airport master plan must, in relation to the landside part of the airport, where possible, describe proposals for land use and related planning, zoning or development in an amount of detail equivalent to that required by, and using terminology (including definitions) consistent with that applying in, land use planning, zoning and development legislation in force in the State or Territory in which the airport is located.	Chapters 3 and 5
For subsection 71 (5) of the Act, a draft or final master plan must:	Chapter 3
(a) address any obligation that has passed to the relevant airport-lessee company under subsection 22 (2) of the Act or subsection 26 (2) of the Transitional Act;	
(b) address any interest to which the relevant airport lease is subject under subsection 22 (3) of the Act, or subsection 26 (3) of the Transitional Act.	Chapter 3
(4) In subregulation (1): “OLS and PANS-OPS surface” have the same meanings as in the <i>Airports (Protection of Airspace) Regulations</i> .	

APPENDIX B – PRE-EXISTING INTERESTS IN JANDAKOT AIRPORT

Interest Holder(s)	Type	Date Registered	Purpose	Location
Ampol Exploration Ltd, Shell Development (Australia) Pty Ltd, Texaco Overseas Petroleum Co., California Asiatic Oil Co.	Easement	19 November 1975	Pipeline	Precincts 1A and 4
Australian and Overseas Telecommunications Corporation Ltd	Caveat	4 June 1992	Telephone Exchange site	Precinct 3
Airservices Australia	Lease	19 September 1996	Non Directional Beacon site	Precinct 3
Airservices Australia	Lease	13 February 1997	Air Traffic Control tower site	Precinct 3
Civil Aviation Safety Authority (Transferred to Minister for Training 17 January 2002)	Lease	11 May 1999	CASA building (now Polytechnic West AeroSpace Training Centre)	Precinct 3

APPENDIX C – ABBREVIATIONS

In this document, unless the contrary intention is indicated:

Act means the *Airports Act 1996* as amended from time to time

AHD means Australian Height Datum

Airservices means Airservices Australia

ANEC means Australian Noise Exposure Concept

ANEF means Australian Noise Exposure Forecast ANEI means Australian Noise Exposure Index

AS2021 means the Australian Standard 2021-2000: Acoustics – Aircraft Noise Intrusion – Building Siting and Construction, as published by Standards Australia

ATC means Airservices Australia Air Traffic Control

AWS means automatic weather station

CASA means the Civil Aviation Safety Authority

DME means distance measuring equipment

EMS means Environmental Management System

FAA means the United States Federal Aviation Administration

GA means general aviation

GPS means Global Positioning System

HLS means helicopter landing site

ICAO means the International Civil Aviation Organization

ILS means instrument landing system

INM means integrated noise model

MDP means major development plan

NASF means the National Airports Safeguarding Framework

NASAG means the National Airports Safeguarding Advisory Group

NDB means non-directional beacon

JAH means Jandakot Airport Holdings Pty Ltd, the airport-lessee company for Jandakot Airport

Minister means the Federal Minister for Infrastructure, Transport and Regional Development (previously Minister for Infrastructure and Regional Development)

MOS means the Civil Aviation Safety Authority's Manual of Standards, issued under Part 139 of the Civil Aviation Safety Regulations 1998

MRS means Metropolitan Region Scheme

OLS means Obstacle Limitation Surfaces

PANS-OPS means Procedures for Air Navigation Services – Aircraft Operations

PAPI means precision approach path indicator

SID means standard instrument departure

STAR means standard arrival route

WAPC means Western Australian Planning Commission

APPENDIX D – REFERENCES

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APPENDIX E – CONSULTANCIES

The following consultancies were used for the specialist input required for the preparation of this Draft Master Plan 2020.

Aeronautical	Airbiz
Civil Engineering	BG & E Engineering
Economic	MacroPlan Dimasi
Environmental	Strategen
Ground Transport	Transcore
Hydraulic Engineering	BG & E Engineering
Survey and Graphic Input	MNG
Town Planning	element

