Darwin International Airport
MASTER PLAN
Final

2017

Approved 6 September 2017

Darwin
International Airport

www.darwinairport.com.au

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ii Foreword

I am pleased to present Darwin International Airport's 2017 Master Plan.

Darwin International Airport (DIA) is a joint-user airport under the *Airports Act 1996* and a joint-user deed with the Department of Defence governs the co-located operation of DIA and Royal Australian Air Force (RAAF) Base Darwin.

DIA continues to provide key air transport infrastructure for the Northern Territory. Darwin is also the Northern Territory's international gateway to Asia. The airport is strategically important to the growth and development of the Northern Territory's tourism, trade, business and leisure activity.

Over $395 million has been invested in DIA since privatisation in 1998, including the recent $75 million terminal expansion finished in 2015.

The direct contribution of economic activity onsite at DIA constitutes 1.2% of Northern Territory Gross State Product (GSP). If multiplier effects are included, DIA's economic contribution to Northern Territory GSP is 2.5%. Additionally, the large General Aviation sector at DIA is crucial to service provision across the Territory. This highlights the importance of Darwin's airport to both the Northern Territory economy and meeting the needs of remote communities.

The 2017 Master Plan retains the fundamental concepts of the previous three Master Plans developed since privatisation of the airport. The changes that have been made largely reflect:

- the projected growth of aviation activity;
- the evolving airport business, the needs of business partners and community requirements; and
- the potential to diversify airport income by expanding the property portfolio.

The five year Airport Environment Strategy continues the strong environmental management regime established by the preceding three Environment Strategies.

The 20 year Master Plan provides a 2037 development concept for long term development as an airport with an optimal mix of aeronautical and non-aeronautical uses. The Master Plan assists and encourages progressive, orderly and strong growth.

Yours sincerely

IAN KEW
Chief Executive Officer
Darwin International Airport

iii Executive Summary

Darwin International Airport Pty Ltd (DIA) has a 50 year lease plus 49 year option over the Darwin International Airport from the Commonwealth of Australia under the *Airports Act 1996*. DIA is also a joint-user airport under the *Airports Act 1996* and a joint-user deed with the Department of Defence governs the co-located operation of DIA and Royal Australian Air Force (RAAF) Base Darwin.

The *Airports Act 1996* (the Act) and other regulations under the Act (the Regulations) stipulate the requirements for the management and operation of the Airport. The specific provisions of the Act applying to joint-user airport Master Plans apply to the DIA Master Plan. The Act requires that DIA prepares a 20 year Master Plan to guide development of existing and proposed airport land uses and facilities, with the Master Plan renewed every 5 years. On 2 February 2015 the DIA Master Plan (and Airport Environment Strategy), because of Defence considerations, was extended by the Federal Minister to 30 June 2017.

The 2010 Master Plan provided direction for the airport's aeronautical development as well as the strategy to enhance the airport's property portfolio.

In line with the 2010 Master Plan a wide range of developments have occurred, including:

Apron, Taxiway and Runway works

- Expansion of the Regular Public Transport (RPT) heavy aircraft apron
- Taxiway pavement and airfield lighting upgrades
- Enhanced Eastern Aviation area infrastructure

Terminal

- Major expansion to the airport terminal, almost doubling in size to 27,000m^2
- Construction of the Catalina Lounge, a new premium lounge for international passengers
- A significant replacement programme of the air handling units within the terminal
- IT upgrade to Common User Terminal Equipment
- Introduction of the DIA's new customer service charter, *Welcome to Our Place*, an innovative new approach to enhance customer experience at the airport

Ground Transport and Car Parks

- Construction of a number of new car parks and expansion of existing facilities
- Construction of covered pedestrian walkways to provide passengers and staff with sheltered access
- Rebranding of public car parking products
- Overlay of Henry Wrigley Drive
- Car parking equipment upgrade

Commercial Developments

- Continued development within the Service Commercial Zone, including Ardent Leisure family entertainment centre, Caltex service station, Flip Out indoor trampoline arena, Osgood South Commercial and a new child care facility
- Construction of Babcock operations centre including hangar
- Darwin Airport Central marketing campaign launched in October 2016

Environmental Initiatives

- Gurambai Walking Trail upgrade
- Installation of a CO_2 monitoring system allowing the terminal air conditioning system to respond to area occupancy
- Expansion of the Building Management System (BMS) to assist in the management of water and power reduction
- Commitment to undertake a number of flood mitigation measures within the DIA lease area to assist in reducing flooding in Darwin's Northern Suburbs from Rapid Creek
- Fencing improvements to DIA's Rapid Creek Reserve
- Creation of a series of short films to educate passengers and community members about DIA's environmental initiatives, including the conservation of Rapid Creek and the installation of new solar arrays
- Continued exploration into solar power infrastructure

Aviation Support Facilities & Infrastructure

- Ring main upgrade works
- Commercial precinct utility infrastructure
- Construction of two solar PV arrays, with a total output of 5.5MW

KEY FEATURES OF THE 2017 MASTER PLAN

The 2017 Master Plan retains the fundamental concepts of the 2010 Master Plan. It provides 2037 development concept plans for long term development as an airport with an optimal mix of aeronautical uses and non-aeronautical uses. Whilst the 2017 Master Plan provides a framework for future development, DIA is conscious the Master Plan must also incorporate the necessary flexibility to meet changing conditions.

The current Darwin International Airport layout is shown in Figure 1.

The 2037 Development Concept, shown in Figure 2, is based on comprehensive technical studies, wide consultation and confidence in the future of the airport business.

This Master Plan demonstrates that DIA can accommodate forecast growth in aircraft movements and passenger activity, expanded aviation support facilities and commercial developments.

Development Objectives

DIA has established the following development objectives to guide its planning and development of aeronautical and non-aeronautical facilities and services:

- Planning supports long term development as an airport with an optimal mix of aeronautical uses
- Provide a safe, secure, reliable and sustainable airport operating environment
- Enhance the airport's contribution to Northern Territory economic growth through developing the airport's aviation and property business and by facilitating the success of our business partners
- Integrate environmental considerations into the development of facilities and services and seek to minimise their impact on the natural environment
- Engage with key community, business and government stakeholders on airport related economic, social and environmental issues and be mindful of surrounding community interests
- Provide airport infrastructure and facilities which are timely, cost effective, flexible in use and provide a good customer experience
- Undertake developments which enhance value to our shareholders and the broader economic community.

Social, Economic and Regional Significance

DIA is a key commercial, personal travel, essential services and military transport facility for northern Australia. It makes a substantial contribution to the Darwin and Northern Territory economies. The aviation and non-aviation activity located at the airport contributes $270M annually to Gross State Product (GSP), constituting 1.2% of total Northern Territory GSP. Currently there are some 1,500 full time equivalent (FTE) jobs at the airport with around 1,800 people actually employed on site. This constitutes some 1.3% of the Northern Territory workforce. In 2037, it is projected that DIA on airport businesses will support some 3,000 jobs and the contribution to Northern Territory GSP will more than double in current dollar terms.

The direct tourism impact of the airport is also considerable, with over 5,000 jobs and over $500M contributed annually to the Northern Territory economy. It is anticipated that the direct tourism contribution over the next 20 years will more than double in terms of jobs and contribution to Northern Territory GSP.

DIA plays a vital role in sustaining remote communities across northern Australia, through the utilisation of the large general aviation capability at the airport. There are a wide range of essential service type air services that connect remote communities to Darwin.

Aviation Activity Forecasts

DIA's role as a hub airport continues to evolve. Initially as a small hub for Jetstar services between Australia and South East Asia, the airport is now positioning itself as the hub for northern Australia, to be the airport and city of choice for regional centres, many of which currently backtrack through other cities to fly north.

It is projected that by 2037:

- Passenger movements, including transit and transferring passengers, will increase from just over 2 million passengers to almost 6 million passengers
- Domestic airfreight will continue to be carried predominantly in the cargo hold of passenger services. As domestic airline movements increase, this will generate additional capacity for domestic freight uplift.
- Combined airline and general aviation aircraft movements will grow from 74,000 movements to over 100,000 movements per year.

Airport Land Use

Land use planning (see Land Use Zone Plan at Figure 3), is fundamental to an airport master plan and is specifically highlighted in the Act. Land use planning in the 2017 Master Plan:

- ensures there is adequate land for expansion of aviation activity
- clearly separates aeronautical and non-aeronautical uses
- has been developed using terminology and definitions consistent with that of the Northern Territory Planning Scheme where possible, with any variations being highlighted
- provides a considerable amount of land for conservation reserves.


QANTAS
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airnorth
VH-ANV

Airfield Development

No runway extensions are needed by 2037. The existing runway system is adequate to cater for future projected traffic and is proposed to be retained in its existing configuration. Lengthening of Runway 18/36 is not required for civilian operations within or beyond the planning period.

Taxiway system enhancement is needed to support the increase in scheduled airline (RPT) services and General Aviation traffic and support new apron areas. (refer to Figure 10).

The RPT apron will continue to effectively use the space and infrastructure available. The apron will continue to expand in a linear manner and then wrap around the terminal to the northwest. When terminal demands requires a pier development the apron concept will alter to provide the best use of apron area.

There is a continued demand for General Aviation facilities and these will be developed on a commercial basis.

Helicopter growth will be accommodated by relocating the helicopter operations further east as required in the longer term.

Protection of Aircraft Operations

Obstacle Limitation Surfaces (OLS) and Procedures for Air Navigation Services – Aircraft Operations (PANS–OPS) are prepared for DIA to assist with the protection of airspace required for aircraft operations around the airport (refer to Figures 11 and 12).

The Department of Defence has statutory protection from intrusion into Defence airspace.

Aircraft Noise Management

As a joint-user airport, Darwin has both civil and military aircraft movements. DIA as the civil airport operator has little direct control over noise produced by aircraft operations other than civil ground running. Airspace management is controlled by the Department of Defence.

The most important noise metric at an airport is the Australian Noise Exposure Forecast (ANEF). The ANEF is a set of geographical contours showing future aircraft noise levels. The ANEF is the only noise metric which has status under the:

- Northern Territory Planning Scheme for land use planning and development consent off airport
- *Airports Act 1996* of the Commonwealth for land use planning and development consent on airport.

The ANEF is used, in accordance with Australian Standard AS2021:2015, to guide land use planning and development consent decisions by the relevant authority. This Master Plan incorporates a 2042 ANEF.

In developing the joint civil-military 2042 ANEF (refer Figure 14), consideration was given to the appropriate scenario for military movements. The scenario chosen as the basis for the 2042 ANEF and associated noise metrics is military traffic throughout the year excluding peak exercise periods (e.g. the biennial Exercise Pitch Black and the annual Exercise Aces North). Although military traffic varies, civil traffic remains relatively stable throughout the year.

Terminal Development

DIA operates a single terminal that handles both domestic and international passenger movements. The terminal building has recently undergone a major $75 million expansion, with works completed in 2015. The terminal has been extended at its eastern and western ends – almost doubling in size – as well as many areas of the original terminal building refurbished.

The terminal expansion represents much more than bricks and mortar. It delivers essential infrastructure, paves the way for trade and tourism growth, and provides capacity to bring more people and investment into Darwin.

Terminal growth beyond 2017 will be accommodated by expanding the existing terminal building within the Terminal and Facilities Zone. The timing of future expansion will be determined by peak hour demand.

It is envisaged that DIA will continue to operate a single terminal that handles both domestic and international passenger movements. Future expansion to the terminal will be predominantly to the west, with the building footprint wrapping around to the northwest (refer Figure 28). A terminal pier will be developed if required, positioned to the west.

Key areas that will drive the future expansion of the terminal will be baggage claim, baggage make-up, and to some extent the domestic departure lounge and retail requirements.

Commercial Development

While DIA's first priority is aviation, a key facet of the master plan is allowing for income diversification and providing clear and transparent strategic directions for growth, while maintaining the flexibility to respond to market directions and demand.

Of the 311 hectares in the airport lease area, some 80 hectares (26 percent) of the land is available for non-aeronautical commercial development.

The 80 hectares in the Service Commercial, Commercial, and Tourist Commercial Zones will be developed as commercial opportunities arise. A demand study for the greater Darwin region has estimated that some 153,000m^2 of development could occur in the Service Commercial and Commercial Zones over the next 20 years.

Darwin Airport Central is DIA's business, retail and entertainment precinct, bounded by the two major external roads of Bagot Road and McMillans Road. It covers the 60 hectare Service Commercial Zone along the northern boundary of the DIA site, as shown in the airport's land use plan (refer Figure 3).

Development in Darwin Airport Central aims to provide the first fully integrated and planned precinct of its kind in the Northern Territory. It is envisaged that development in this zone will offer a premium level of centrally located commercial and retail space (refer Figure 30).

Land in the Aviation Reservation Zone (46 hectares), while being planned for ultimate Aviation use, can be utilised for a variety of commercial purposes in the short to medium term.

Ground Transport

Projected growth in both aviation traffic and commercial development is estimated to increase daily airport trips from around 14,000 currently to some 47,000 in 2037. One feature of the overall trip generation will be commercial development focused along Osgood Drive.

The major external access development concept is a new all movements signalised intersection off McMillans Road which will connect with Osgood Drive. The new intersection will be located between Rapid Creek and Sabine Roads and a notional location is illustrated in Figure 31.

The external road access developments envisioned over the planning period are:

- new signalised intersection on McMillans Road providing access to the Commercial Zone
- downgrading of the existing intersection of McMillans Road and Charles Eaton Drive to provide left-in and left-out traffic movements only, to coincide with the commissioning of the new signalised intersection
- increased capacity of Henry Wrigley Drive north of Abala Road, and increased turning movement capacity and storage capacity at the intersection of McMillans Road, Rothdale Road, and Henry Wrigley Drive
- possible improvements to the intersection of Bagot Road and Osgood Drive.

The approach to development of the internal road network will be to:

- maximise the use of existing road capacity
- segregation of passenger and non-passenger (eg maintenance, commercial developments) traffic as far as practicable
- progressive enhancement of road system capacity in line with demand
- facilitate aviation and commercial developments.

A comprehensive parking study has indicated a medium term requirement for multi-level parking capacity. The location of one or more multi-level car parks during the planning period will be subject to detailed planning and design at the time. More formalised General Aviation car parking is also an issue and will be developed when commercially viable.

Environmental Management

The Airport Environment Strategy (AES) is at Appendix 1 to the Master Plan.

The AES establishes a framework for assessing environmental compliance with the relevant standards and legislation. The AES also guides continual improvement of environmental management at the airport.

DIA strives to integrate environmental considerations into the development of facilities and services, and seeks to minimise their impact on the natural environment.

All proposed developments will take into consideration the procedures and requirements contained in the AES as well as the associated action plans and environmental management plans.

DIA has established the following key objectives to guide environmental management of the airport site:

- Maintain an Environmental Management System (EMS) that is consistent with the international standard ISO 14001:2004 (Environmental Management).
- Ongoing identification of environmental and heritage values of the site.
- Commitment to continual improvement in minimising environmental consequences of activities.
- Continue to define clear responsibilities and conduct training for staff and contractors to achieve the objective of the EMS as well as ensuring that appropriate authority and resources are provided to effectively meet environmental targets.
- Inform all new and existing staff and contractors working within the airport environs of their environmental responsibilities.

- Maintain systems that identify legal and other requirements that apply to environmental management and keep DIA informed of change to existing and/or new legislation and regulations.
- Ensure periodic review and auditing of the EMS to ensure its continuing suitability, effectiveness and compliance with objectives.

The environmental aspects addressed in the AES include:

- Water Management
- Soil and Land Management
- Biodiversity and Conservation Management
- Air Quality and Emissions
- Noise
- Hazardous Substances and Dangerous Goods
- Waste and Resource Management
- Sustainability, Energy and Resource Management
- Heritage
- Development
- Tenant and Contractor Management
- Community.

DIA is committed to conservation best practice and creating an environmentally sustainable airport operation. The airport is proud of its environmental performance and will continue to work closely with its partners to incorporate environmental considerations into every aspect of its business.

Consultation

This Master Plan has been prepared by DIA following consultation with a range of stakeholders.

FIGURE 1: CURRENT DARWIN INTERNATIONAL AIRPORT LAYOUT 2017

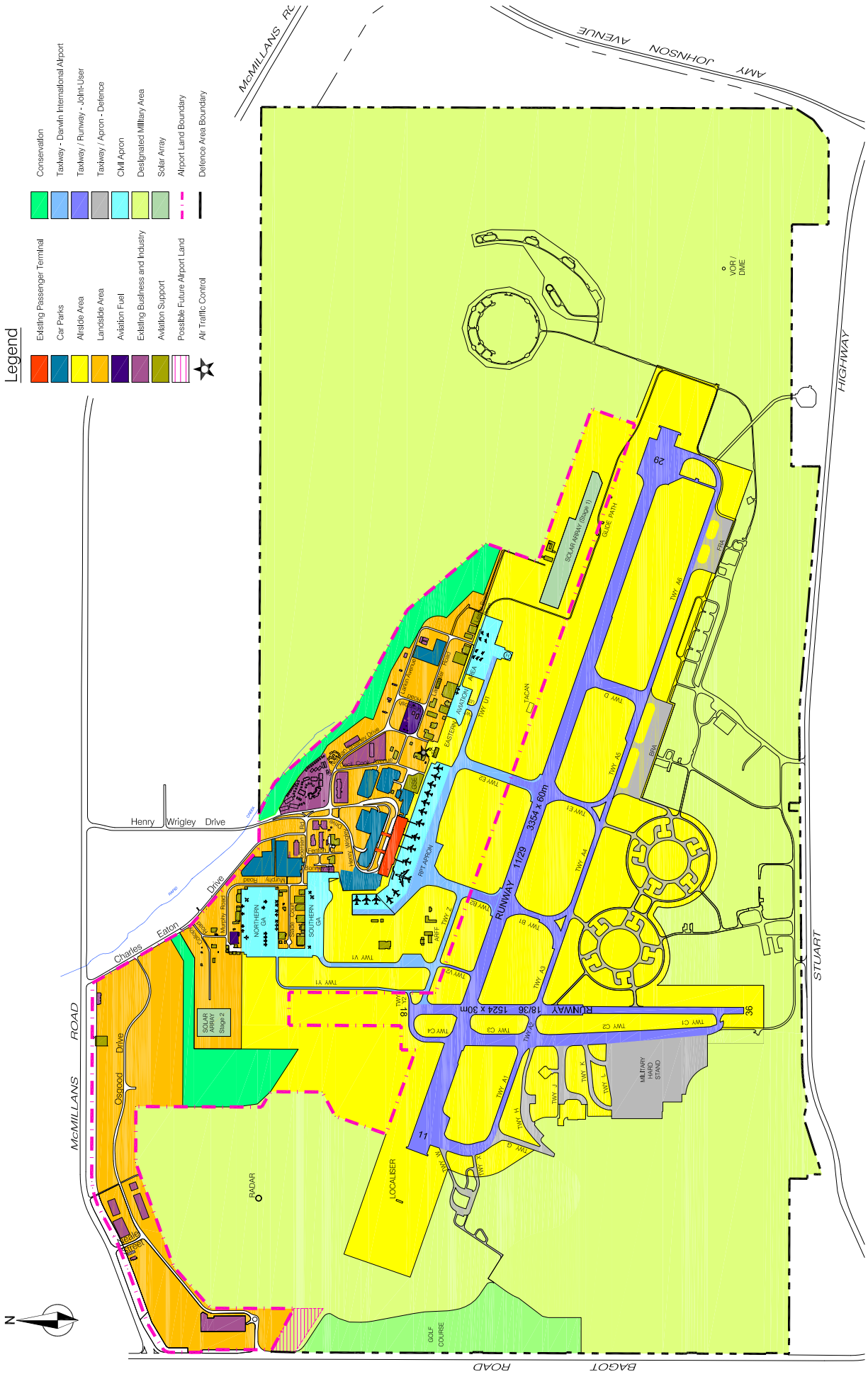


FIGURE 2: 2037 DARWIN INTERNATIONAL AIRPORT DEVELOPMENT CONCEPT

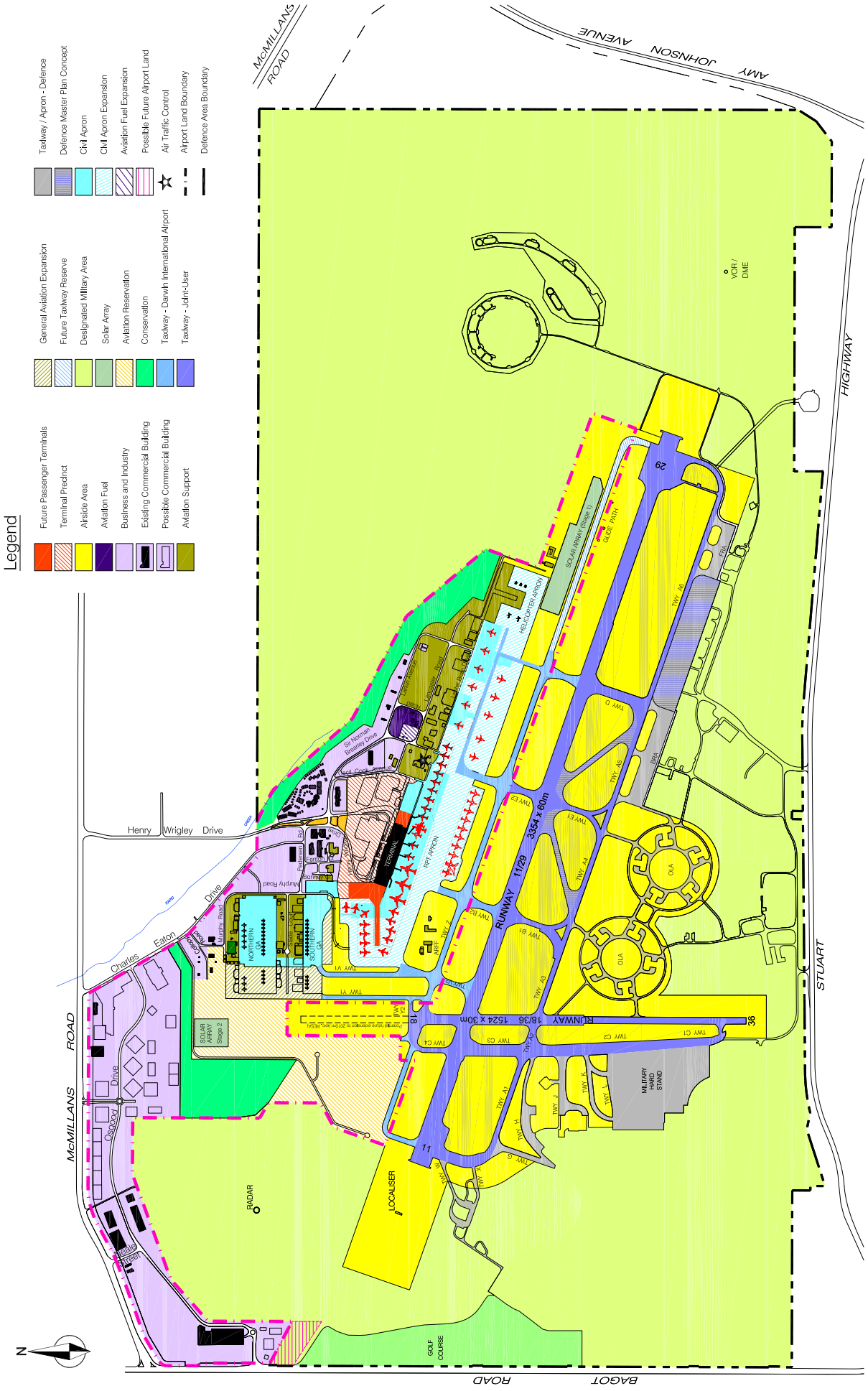
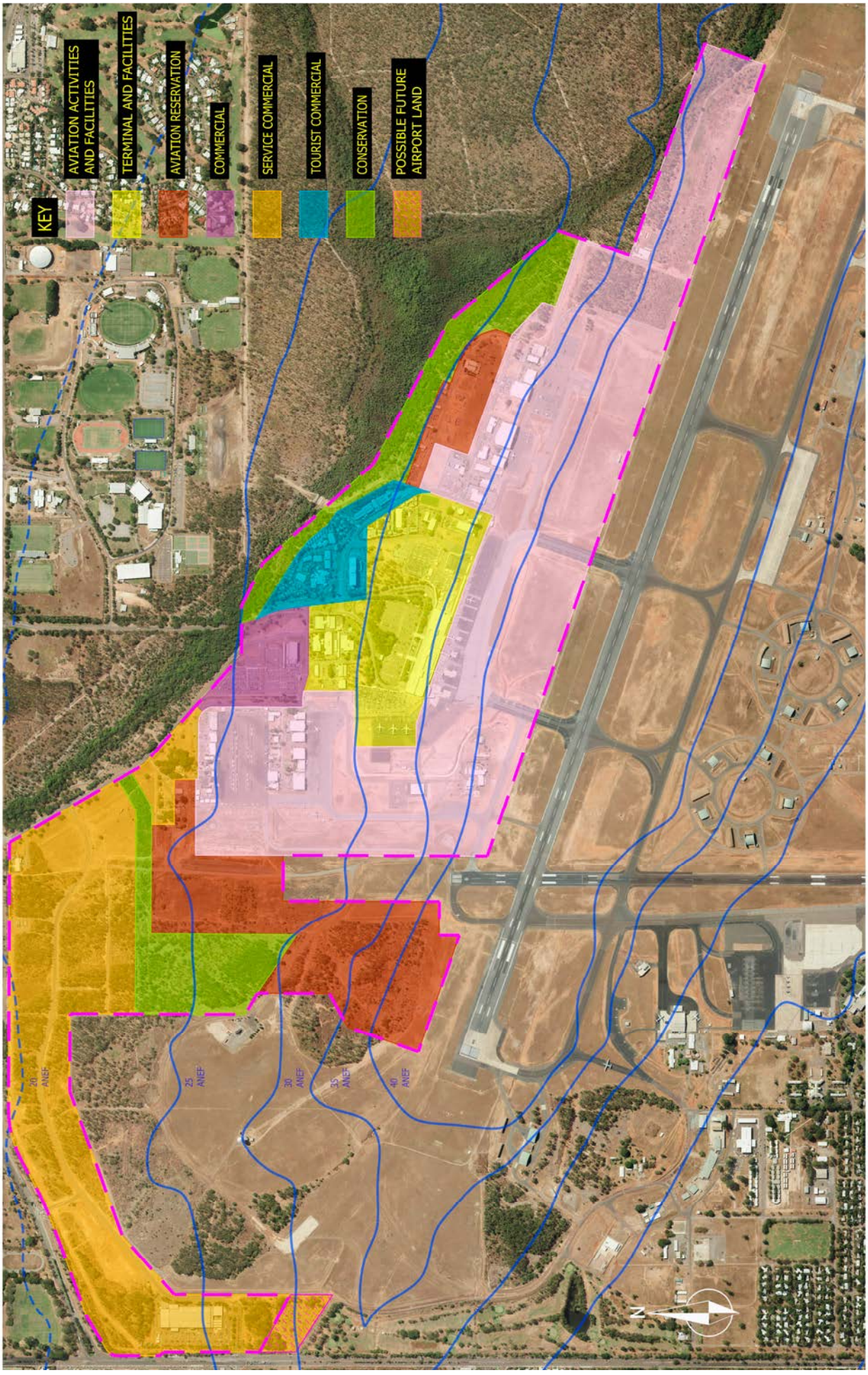


FIGURE 3: AIRPORT LAND USE ZONE PLAN



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SECTION 1

Introduction

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- Darwin International Airport is a curfew free international and domestic gateway to the Northern Territory.
- The *Airports Act 1996* specifies that the airport's Master Plan be reviewed every 5 years.
- The 2017 Master Plan has been prepared following comprehensive technical studies and consultation with stakeholders.

SECTION 1

Introduction

Darwin International Airport (DIA) is located around 13 kilometres by road northeast of the Darwin Central Business District on a 311 hectare leased site plus the 215 hectare joint-user (civil plus military use) area. DIA is located within the City of Darwin, with good road connections, adjacent to the coastline to the west and the district centre of Casuarina to the north. The airport is a curfew free gateway to the Northern Territory, providing international, domestic and general aviation services.

DIA is ideally located as part of the regional transport system as it is the nearest capital to the developing areas of South East Asia, including Singapore, Malaysia, Indonesia and the Philippines. Darwin is located approximately halfway between major Australian cities and South East Asian capitals.

Darwin International Airport Pty Ltd has a 50 year lease plus 49 year option over the Darwin International Airport from the Commonwealth of Australia under the *Airports Act 1996*. DIA is also a joint-user airport under the *Airports Act 1996* and a joint-user deed with Department of Defence governs the co-located operation of DIA and RAAF Base Darwin. The DIA airport boundary is shown in Figure 4.

DIA civil facilities were moved from the south of the main runway to the north in the early 1990s in order to separate military and civil activity. With the airport lease under the *Airports Act 1996* in place until 2097, DIA will continue to be the only major airport in the Darwin region until at least the turn of the next century.

The *Airports Act 1996* (the Act) and other regulations under the Act (the Regulations) stipulate the requirements for the management and operation of the airport. The specific provisions of the Act applying to joint-user airport Master Plans apply to the DIA Master Plan. The Act requires that DIA prepare a Master Plan to guide development of existing and proposed airport land uses and facilities.

2017 MASTER PLAN

This Master Plan has been prepared by DIA following consultation with a range of stakeholders. While the 2017 Master Plan provides a framework for future development to 2037, DIA is conscious the Master Plan must also incorporate the necessary flexibility to meet changing conditions.

This Master Plan has been prepared by DIA with the assistance of a consultant team. The consultants and their technical work area are outlined below.

TABLE 1: CONSULTATION TEAM

CONSULTANT	TECHNICAL AREA
Airbiz Aviation Strategies Pty Ltd	Airside, terminal and noise management
Jacobs	Motor vehicle traffic
ACIL Allen	Economic impact study
Tourism Futures International (TFI)	Passenger and aircraft movement forecasts
The Airport Group (TAG)	Prescribed Airspace
Wyle Laboratories	Joint civil-military ANEC/ANEF

FIGURE 4: AIRPORT LEASE BOUNDARY

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SECTION 2

Background

2

- Civil operations commenced in 1946, when Darwin became a joint-user airport
- DIA has invested over $395 million on upgrading aviation facilities, commercial developments and environmental amenities since 1998.

SECTION 2

Background

Darwin's first aerodrome was located at Parap Police Paddock which was selected in 1919 as the Australian point of entry for the England to Australia air race. Keith and Ross Smith arrived on 10 December 1919 as the first international flight. Two days later, the first flight across the continent arrived from Melbourne. This aerodrome continued to be developed along the alignment of the current Ross Smith Avenue.

The current Darwin International Airport (DIA) site was commissioned in July 1940 by the Royal Australian Air Force (RAAF) and continued in its sole use until the end of the Second World War in 1945. During the Second World War it came under attack many times by Japanese aircraft, evidence of which remains in the form of bullet holes in some buildings. The Commonwealth Government made the military airfield available for civil use under the terms of a joint user policy, which included requirements for a civil building area to be set aside as a self-contained entity. At the time all existing civil building development was in the south west part of the aerodrome, in what is now the Department of Defence area. It was agreed that the civil facilities could be placed here whilst civil traffic levels were low. Starting small – in part of a hangar – the civil terminal expanded, as did the apron, roads and car park serving it, creating considerable congestion over time.

This congestion was recognised as early as the 1950s and plans were prepared for a civil move north of the main Runway 11/29. However, the high cost of this option led to civil facilities being planned to move to the east of Runway 18/36. Runway upgrades continued throughout this time with the high-strength main runway completed in 1962 and the crosswind runway reconstructed in 1964. Around the same time, the eastern development started with a new combined fire station and control tower, traffic operations centre and other technical facilities placed there. A general aviation hangar area was also set out.

This situation continued until 1980 when it was concluded that civil operations should again transfer to the north-side. Following various studies, the Government confirmed this strategy in 1982 with the construction of a civil terminal starting in 1984. However, construction was halted the next year due to concerns over the total cost.

The Federal Airports Corporation assumed responsibility for civil facilities at Darwin on 1 April 1989 and immediately commenced the development of civil facilities on the north-side of the airport, largely along the lines of the Department of Aviation's 1983 Master Plan. Under a $55 million contract, construction commenced on a domestic/international terminal, aircraft apron, taxiways, roads and car parks in January 1990. Separate helicopter and general aviation aprons and support infrastructure were also developed.

Civil air services first started operations from the current terminal on 15 December 1991. Shared civil-military facilities, including a new control tower and separate fire station, were constructed on the north-side in 1998 by the Department of Defence.

In 1998, Airport Development Group acquired the three main Northern Territory airports: Alice Springs, Tennant Creek and Darwin International airports. Airport Development Group owns 100% of Northern Territory Airports Pty Ltd, which in turn owns 100% of Darwin International Airport Pty Ltd. Darwin International Airport Pty Ltd is the Airport Operator.

JOINT-USER DEED

Darwin International Airport has been a joint-user airport with shared civil-military facilities since 1946. Responsibilities between Department of Defence and DIA are set out in a joint-user deed.

Darwin serves as a Defence transport air head, logistical base, redeployment point for combat aircraft and exercise base, with RAAF Base Darwin located on the southern side of the main runway. Both runways are under the control of the Department of Defence.

There is a cost-sharing agreement for the use of the aircraft manoeuvring areas (runways and taxiways) by civil aircraft. Both parties (civil and Defence) are responsible for providing and maintaining their own facilities and services whether they are located in their own areas or elsewhere. The Department of Defence provides Air Traffic Control facilities which are

staffed by Defence personnel. Under the joint-user deed, the Department of Defence is also responsible for the control of environmental impacts, including the preparation of ANEF charts.

SIGNIFICANT DEVELOPMENTS ON AIRPORT

The airport has continually invested since privatisation. Details of recent significant developments are outlined below. Since the Airport Development Group acquired Darwin International Airport there have been substantial developments in both infrastructure and facilities at the airport. DIA has invested over $395 million on upgrading aviation facilities, commercial developments and environmental amenities since 1998.

Details of the significant developments that have been funded by DIA are outlined below.

Apron, Taxiway and Runway Works

2008

- Replacement of the visual approach guidance system (with the installation of the PAPI system) in a joint venture with the Department of Defence $500,000

2009

- Construction of a new open cut drain ($2.5 million) in preparation of further apron expansion to the west of the current RPT apron
- Construction of two additional large aircraft parking positions to give greater capacity during the peak periods $5.5 million

2011

- Extend main apron fuel hydrant system $700,000
- Upgrade emergency airfield lighting $160,000
- Helicopter apron expansion $645,000
- Northern General Aviation apron resurfacing $445,000

2012

- Enhanced Eastern Aviation area infrastructure $1 million
- Aircraft Nose In Guidance System installation $210,000

2014

- RPT heavy aircraft apron expansion $6.3 million
- Upgrade to General Aviation terminal $130,000
- Taxiway pavement and airfield lighting upgrades $16.6 million
- Enhanced Inspection Area $1.7 million

2015

- Taxiway pavement and lighting upgrades $2.2 million
- Southern General Aviation apron resurfacing $1.7 million

Terminal

2008

- Refurbishment of terminal retail facilities plus upgrade to terminal toilets $1.3 million
- Investment in new generators to provide back-up power to the airport in the event of a mains failure $2 million
- Upgrade of terminal air-conditioning packages to reduce energy consumption, costing $350,000
- Redesign of the domestic departure lounge ($100,000) to improve efficiency in passenger processing

2010

- Construction of a weather proofing walkway between Bays 2 and 3 to assist in the processing of passengers, costing $1.3 million

2011

- Main services to airport $225,000

2012

- Install electrical substation $460,000
- International outbound security upgrade $570,000
- Transit screening equipment $200,000
- Car rental booth upgrade $420,000

2013

- New x-ray equipment for oversized baggage $450,000

2014

- Major expansion to airport terminal, including new retail and airline lounges $75 million
- New baggage locker facility and designated passenger pick-up zone within existing Short Stay car park $570,000
- New x-ray security equipment $430,000
- New seating to complement terminal expansion $300,000

2015

- New covered walkway to aircraft bays 21-25 $500,000
- CCTV upgrades $100,000
- New enhanced inspection point $500,000
- Additional furniture to complement terminal expansion $220,000
- Sealing works to terminal roof $300,000

2016

- Installation of 10 large-scale fans within the terminal building, resulting in improved air flow and reducing the terminal's dependence on air conditioning $350,000
- Construction of the Catalina Lounge, a new premium lounge for international passengers $500,000
- Additional furniture to complement terminal expansion $200,000
- Air handling unit replacement programme $1.6 million
- IT upgrade to Common User Terminal Equipment $650,000

Ground Transport and Car Parks

2009

- Completion of the extension to public car park including revising and extending the native garden "Matboerma' landscaping $450,000
- $1.2 million development of new staff car park facility

2011

- Car park expansion $4.3 million

2012

- Construction of passenger shelter in Long Stay Saver car park $150,000
- Covered walkways to Long Stay car parks $1.1 million

2014

- General Aviation car park extension $515,000
- Construction of car park for Inpex $2.6 million
- Car hire compounds $360,000
- New public bus shelter $160,000

2015

- Construction of second car park for Inpex $1 million
- Overlay of Henry Wrigley Drive $770,000
- Extension to Larkin Avenue and Lancaster Road $240,000
- Car rental car park improvements $250,000
- Undercover walkway extension to Long Stay Saver car park $490,000

2016

- Construction of a new staff car park and road realignment works $1.2 million
- Car parking equipment upgrade $740,000

2017

- Bicycle path along Henry Wrigley Drive $260,000
- New road network signage $150,000

Commercial and Environment Developments

2008

- Realignment of Cecil Cook intersection with Sir Norman Brearley Drive – included drainage works and erosion protection to facilitate the entry and exit of the Darwin Airport Inn development $650,000
- Expansion of the Bunnings development $850,000
- Commencement of McMillians Road landscape buffer costing $120,000

2010

- Preparation of services and infrastructure to accommodate a 116 room Airport Lodge

2012

- Australian Federal Police office building $9.6 million
- Australian Federal Police Canine Facility $2.6 million

2013

- Department of Environment air-conditioning upgrade $1.2 million

2014

- Installation of new billboards $380,000

2015

- Installation of new digital advertising in terminal $185,000
- Construction of Ardent Leisure family entertainment centre $6.4 million
- Construction of Caltex service station $2.9 million
- Commitment to undertake a number of flood mitigation measures within the DIA lease area to assist in reducing flooding in Darwin's Northern Suburbs from Rapid Creek
- Fencing improvements to DIA's Rapid Creek Reserve

2016

- Gurambai Walking Trail upgrade $110,000
- Construction of Babcock Operations Centre including hangar $11 million
- Construction of Flip Out indoor trampoline arena $5.6 million
- Construction of Osgood South Commercial $4.5 million
- Darwin Airport Central marketing campaign launched October 2016
- Development of a new child care facility, adjacent to Osgood South Commercial $2.3 million

Aviation Support Facilities & Infrastructure

2013

- New Qantas Engineering facility $3.8 million

2014

- Top End Medical Retrieval Service (TEMRS) aviation and medical facility $9.4 million

2015

- Ring main upgrade $2.2 million
- Commercial precinct utility infrastructure $4.8 million
- Potable water pump upgrade $900,000

2016

- Construction of 5.5MW solar project (Stage 1 and Stage 2) encompassing two solar PV arrays $13 million

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SECTION 3

Airports Act Framework

3

- The *Airports Act 1996* specifies the content of an Airport Master Plan which covers aviation, commercial and environment planning requirements.
- Consultation with government, business and community is a prominent part of the Master Plan development process.
- The Master Plan must be submitted to the Federal Minister for Infrastructure and Transport for approval.
- The Final (approved) Master Plan is normally valid for 5 years, unless extended by the Federal Minister.

SECTION 3

Airports Act Framework

AIRPORTS ACT 1996 AND ASSOCIATED REGULATIONS

The Federal Parliament passed the *Airports Act 1996* (the Act) and associated regulations to govern the development and operations of Federal airports leased to the private sector. The Act and regulations are the statutory controls for the ongoing regulation of activities on airport land for both aeronautical and non-aeronautical development.

Part 5 of the *Airports Act 1996* directs that an airport-lessee company must develop a Master Plan. In accordance with the Act, the Master Plan must provide strategic direction for development of the airport, and an environment strategy.

AIRPORT MASTER PLAN REQUIREMENTS

Section 70 of the Act states that there is to be a final master plan. The specific provisions of the Act applying to joint-user airports apply to the DIA Master Plan.

Section 71 of the Act specifies that a joint-user airport master plan must set out:

- development objectives
- an assessment of the future needs of civil aviation users and other uses of the airport
- intention for land use and related development of the area embracing landside, surface access and land planning/ zoning aspects as well as airside aspects including runways or taxiways
- an Australian Noise Exposure Forecast in relation to the airport for land surrounding the airport
- flight paths at the airport
- plans for managing aircraft noise within the area
- an assessment of environmental issues associated with the implementation of the plan
- management of the environmental impacts including plans for ameliorating or preventing environmental impacts
- in relation to the first 5 years of the master plan – a plan for a ground transport system on the landside of the airport
- in relation to the first 5 years of the master plan – detailed information on the proposed development that are to be used for commercial, community, office, or retail purposes; or for any other purpose that is not related to airport services
- in relation to the first 5 years of the master plan – the likely effect of the proposed development on employment levels at the airport, and the local and regional economy and community
- an environment strategy.

Part 5 Division 3 Section 72 of the Act also states that the plan must cover a 20-year planning period. The Master Plan remains in force for a 5-year period, and thus will be reviewed every five years.

AIRPORT MASTER PLAN ASSESSMENT PROCESS

When a Master Plan is prepared, consultation must be undertaken to ensure compatibility and acceptability of the plan. The stakeholders directly consulted included:

- Department of Infrastructure and Regional Development (DIRD)
- Department of Defence
- Northern Territory Government
- local government
- airlines and other users of the airport
- aviation agencies
- Community Consultation Group and selected Planning Co-ordination Forum members.

Pursuant to Section 79(1) of the Act, the Preliminary Draft Master Plan was advertised for public comment for a period of 60 business days, from 7 March to 6 June 2017. Prior to the public comment period, DIA advised in writing the following persons that the Preliminary Draft Master Plan was about to be released for public comment:

- the Northern Territory Minister for Infrastructure, Planning and Logistics
- the Northern Territory Department of Infrastructure, Planning and Logistics
- City of Darwin

Evidence of this was provided to the Minister by way of a copy of the advice to each of the above and a signed certificate.

Once the public comment period closed, DIA submitted to the Minister the Draft Master Plan, along with a copy of any written comments received, and a summary of those comments.

The summary contained the following:

- the names of persons or organisations that made comments
- a summary of the comments
- a statement declaring that DIA has taken due regard of the comments
- any other information relating to the comments that may be required by the Regulations.

The Minister had 50 business days to decide whether to approve or refuse to approve the plan. In making a decision to approve or refuse the Draft Master Plan, the Minister must have regard to:

- the extent to which the plan achieves the purpose of a final Master Plan
- the extent to which the plan meets the need of the airport users
- the effect on the use of land, including within the airport site and the areas surrounding the airport
- consultation undertaken
- the views of the Civil Aviation Safety Authority (CASA) and Airservices Australia in respect to safety and operational aspects
- any other matters considered relevant.

FIGURE 5: MASTER PLAN PROCESS OUTLINE

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SECTION 4

Stakeholder and Community Consultation

4

- Darwin International Airport (DIA) is committed to genuine consultation with all stakeholders.
- During preparation of the Master Plan, DIA undertook consultation with government agencies, airlines, general aviation operators, airport businesses, DIA Community Consultation Group and selected Planning Coordination Forum members to scope the major issues.

SECTION 4

Stakeholder and Community Consultation

Darwin International Airport (DIA) is committed to effective and genuine consultation with all key stakeholders. DIA endeavours to provide a considered and clearly articulated approach to ensure that accurate information is disseminated and that feedback is encouraged in regards to development of DIA.

COMMUNICATION AND CONSULTATION APPROACH

During preparation of the Master Plan, DIA undertook consultation with government agencies, airlines, general aviation operators, airport businesses, DIA Community Consultation Group and selected Planning Coordination Forum members to scope the major issues.

As part of the public consultation process, DIA:

- Made copies of the Preliminary Draft Master Plan available from the Darwin International Airport Management Centre and darwinairport.com.au
- Undertook various discussions with NT Government and key stakeholders, and held two public information display events.

Stakeholders directly consulted during the public consultation period of the PDMP included:

- Airservices Australia
- City of Darwin
- City of Palmerston
- Department of Defence
- Litchfield Council
- Northern Territory Department of Infrastructure, Planning and Logistics
- Other Northern Territory Government agencies
- Airlines
- Airport businesses
- Australian Border Force
- Department of Agriculture
- Australian Federal Police
- General Aviation operators
- DIA Community Consultation Group and Planning Coordination Forum members

Additionally, during preparation of the Master Plan, DIA undertook consultation with key stakeholders through surveys, data collection or direct consultation as part of the various technical studies.

In accordance with the Act, prior to the commencement of the public comment period, DIA advised, in writing the following persons:

- the Northern Territory Minister for Infrastructure, Planning & Logistics
- the Northern Territory Department of Infrastructure, Planning & Logistics
- City of Darwin

SECTION 5

Development Objectives

5

- Darwin International Airport has established Development Objectives to guide its planning and development of aeronautical and non-aeronautical facilities and services.

SECTION 5

Development Objectives

Darwin International Airport (DIA) has established the following development objectives to guide its planning and development of aeronautical and non-aeronautical facilities and services:

1. Planning supports long term development as an airport with an optimal mix of aeronautical uses.
2. Provide a safe, secure, reliable and sustainable airport operating environment.
3. Enhance the airport's contribution to Northern Territory economic growth through developing the airport's aviation and property business and by facilitating the success of our business partners.
4. Integrate environmental considerations into the development of facilities and services and seek to minimise their impact on the natural environment.
5. Engage with key community, business and government stakeholders on airport related economic, social and environmental issues and be mindful of surrounding community interests.
6. Provide airport infrastructure and facilities that are timely, cost effective, flexible in use and provide a good customer experience.
7. Undertake developments that enhance value to our shareholders and the broader economic community.

In developing the airport, DIA will comply with the obligations of the *Disability Discriminations Act 1992*, the *Disability (Access to Premises – Buildings) Standards 2010*, and the *Disability Standards for Accessible Public Transport 2002* (Transport Standards).

SECTION 6

Social, Economic and Regional Significance

- The direct and indirect (multiplier) contribution of Darwin International Airport to the Northern Territory economy constitutes 2.5% of GSP.
- The direct tourism sector impact of the airport creates over 5,000 jobs in the tourism industry.
- There are 1,800 people employed on the Darwin International Airport site, which constitutes 1 in 80 Northern Territory jobs.

SECTION 6

Social, Economic and Regional Significance

CURRENT AND 2022 ECONOMIC IMPACT OF DARWIN INTERNATIONAL AIRPORT

Darwin International Airport (DIA) is a key commercial, personal travel, essential services and military transport facility for northern Australia. It makes a substantial contribution to the Darwin and Northern Territory economies. This economic analysis looks at the transport infrastructure, airline, general aviation and non-aviation commercial business contribution of DIA to the Northern Territory economy.

Input-output analysis has been used to estimate the economic impact of the airport, using data obtained from a survey of airport businesses and airport financial information. Total impacts include the initial (or direct) effect of the stimulus and the multiplier (or indirect) effects that arise as a result of the linkages between industries in an economy.

The current annual impacts of the airport on the Northern Territory economy are significant. Currently, there are some 1,500 full time equivalent (FTE) jobs at the airport with around 1,800 people actually employed on site. This constitutes some 1.3% of the Northern Territory workforce. Put another way, 1 in 80 Northern Territory jobs are at Darwin International Airport.

In terms of Gross State Product (or Value Added) the aviation and non-aviation activity located at the airport contributes $270M annually. This constitutes 1.2% of total Northern Territory Gross State Product (GSP).

The current multiplier effects in the Northern Territory economy of the aviation and non-aviation businesses at the airport are in excess of 1400 additional jobs and a contribution to GSP of $318M per annum (refer Table 2). The direct and indirect (multiplier) contribution to the Northern Territory economy constitutes 2.5% of GSP.

DIA also makes a significant contribution to the Darwin and Northern Territory economies by facilitating the air travel of domestic and international visitors into the Territory. An airport is especially important in a city such as Darwin due to the remoteness of its location, distance from other population centres in Australia and proximity to South East Asia.

The direct tourism impact of the airport is also considerable with over 5,000 jobs and over $500M added annually to the Northern Territory economy (refer Table 3). These numbers are net of the tourism impacts due to visitor spending at the airport, as these are already included in figures shown in Table 2.

Tables 4 and 5 indicate the economic value of DIA to the Northern Territory in 2022. Of note is that airport employment has increased by 20% and contribution to GSP has increased by 23%. In terms of the wider tourism impact there have also been significant increases in contribution to the Northern Territory economy.

FUTURE ECONOMIC IMPACT OF DARWIN INTERNATIONAL AIRPORT

Airport Business Impacts in 2037

Based on future passenger numbers and other non-aviation developments, the projected impact of airport-related activities on the Northern Territory economy in 2037 is even more significant. It is projected that DIA on airport businesses will support some 3,000 jobs in 2037 and the contribution to Northern Territory GSP will more than double in current dollar terms (refer Table 6).

Tourism Impacts in 2037

The direct tourism contribution over the next 20 years will more than double in terms of jobs and contribution to Northern Territory GSP (refer Table 7).

OTHER RELATED ACTIVITIES

There are a number of activities at DIA whose value to Darwin and the Northern Territory has not been quantified in the above analysis. Several examples are outlined below.

Medical Services

The Royal Darwin Hospital (RDH) provides the Territory's main concentration of medical services and serves as the main referral centre for the Top End of the Northern Territory and parts of Western Australia. The Top End Medical Retrieval Service (TEMRS) is operated by the Northern Territory Department of Health in the Top End through CareFlight. TEMRS provides medical advice, assistance and a medical retrieval service to all people living and working in rural and remote areas of the Top End, ships at sea, and oil and gas companies in the Timor Sea. CareFlight also has a CareFlight International base in Darwin which undertakes medical retrievals from South East Asia.

RAAF Base Darwin

RAAF Base Darwin, co-located with Darwin International Airport, is a strategic Defence asset and capability. It is Australia's largest Mounting Base being both near Allied countries and aircraft training areas. It is the location of major exercises such as Pitch Black and Aces North. The Forward Mounting Base role was exemplified in Australia's lengthy military involvement in East Timor. Darwin also serves as a Forward Base for RAAF Border Protection operation.

Under the 2014 Australia-United States Force Posture Agreement there will be increasing deployments of United States Marine Corp aviation elements and visiting United States Air Force aircraft.

Border Protection

Darwin International Airport is a major base for border protection aircraft with 24 hour northern Australia surveillance undertaken by Bombardier Dash 8 aircraft.

Connecting Communities in the Territory

Darwin International Airport plays a vital role in sustaining remote communities across northern Australia through the utilisation of the large general aviation capability at the airport. There are a wide range of essential service type air services that connect remote communities to Darwin. Examples include law enforcement, education, utilities maintenance, housing, and conduct of elections.

TABLE 2: ANNUAL AIRPORT RELATED BUSINESS IMPACTS 2017

	AVIATION BUSINESS IMPACTS		NON-AVIATION BUSINESS IMPACTS		TOTAL BUSINESS IMPACTS	
	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)
Direct Contribution	1172	236.6	324	33.9	1496	270.5
Indirect Contribution	1279	281.8	149	36.2	1428	318.0
Total	2451	518.4	473	70.1	2924	588.5

Note: The above effects are in current dollar values
Data source: ACIL Allen

TABLE 3: AIRPORT ENABLED TOURISM IMPACTS ON THE NT ECONOMY 2017

	DOMESTIC VISITORS		INTERNATIONAL VISITORS		ALL VISITORS	
	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)
Direct Contribution	4429	434.4	1102	108.1	5531	542.5
Indirect Contribution	2608	402.5	649	100.1	3257	502.6
Total	7037	836.9	1751	208.2	8788	1045.1

Note: The above effects are in current dollar values
Data source: ACIL Allen

TABLE 4: ESTIMATED ANNUAL AIRPORT RELATED BUSINESS IMPACTS 2022

	AVIATION BUSINESS IMPACTS		NON-AVIATION BUSINESS IMPACTS		TOTAL BUSINESS IMPACTS	
	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)
Direct Contribution	1398	292.2	401	41.6	1799	333.8
Indirect Contribution	1558	345.7	184	43.9	1742	389.6
Total	2956	637.9	585	85.5	3541	723.4

Note: The above effects are in current dollar values
Data source: ACIL Allen

TABLE 5: ESTIMATED ANNUAL AIRPORT ENABLED TOURISM IMPACTS ON THE NT ECONOMY 2022

	DOMESTIC VISITORS		INTERNATIONAL VISITORS		ALL VISITORS	
	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)
Direct Contribution	5710	560.1	1423	139.6	7133	699.7
Indirect Contribution	3362	519.0	838	129.3	4200	648.3
Total	9072	1079.1	2261	268.9	11333	1348.0

Note: The above effects are in current dollar values
Data source: ACIL Allen

TABLE 6: ESTIMATED ANNUAL AIRPORT RELATED BUSINESS IMPACTS 2037

	AVIATION BUSINESS IMPACTS		NON-AVIATION BUSINESS IMPACTS		TOTAL BUSINESS IMPACTS	
	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)
Direct Contribution	2302	495.4	704	72.4	3006	567.8
Indirect Contribution	2673	600.6	320	75.8	2993	676.4
Total	4975	1096.0	1024	148.2	5999	1244.2

Note: The above effects are in current dollar values
Data source: ACIL Allen

TABLE 7: ESTIMATED ANNUAL AIRPORT ENABLED TOURISM IMPACTS ON THE NT ECONOMY 2037

	DOMESTIC VISITORS		INTERNATIONAL VISITORS		ALL VISITORS	
	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)	EMPLOYMENT (FTE)	VALUE ADDED GSP ($M)
Direct Contribution	10815	1060.9	2794	274.1	13609	1335.0
Indirect Contribution	6370	983.0	1646	253.9	8016	1236.9
Total	17185	2043.9	4440	528.0	21625	2571.9

Note: The above effects are in current dollar values
Data source: ACIL Allen

SECTION 7

Aviation Activity Forecasts

- Low cost carrier domestic-international hub activity has significantly reduced in recent years.
- Full service international airline point-to-point and transit services have been introduced.
- Total international and domestic passengers are forecast to increase from just over 2 million to almost 6 million over the next 20 years.

SECTION 7

Aviation Activity Forecasts

INDUSTRY OUTLOOK

As with the 2010 Master Plan, aviation industry conditions have changed considerably since the preparation of the previous Master Plan. In concert with much of the Australian economy, some airports and airlines are experiencing lower growth rates than historically.

Particular features of DIA airline services over the last several years have been the:

- return of full service international carriers
- the volatility of Low Cost Carrier services
- Qantas Group provides just over half of the capacity to and from Darwin.

The Darwin General Aviation sector continues to experience entry and exit of industry participants.

Since the 2010 Master Plan, DIA's role as a hub airport has continued to evolve. Initially as a small hub for Jetstar services between Australia and South East Asia, the airport is now positioning itself as the hub for northern Australia, to be the airport and city of choice for regional centres, many of which currently backtrack through other cities to fly north.

DIA's passenger movements are heavily driven by airline and capacity developments in line with this strategy to develop as a narrowbody hub between southern Australia and points in Asia. As new aircraft types and technology are introduced, it is anticipated that the current reach into South East Asia will further extend into North Asia in future.

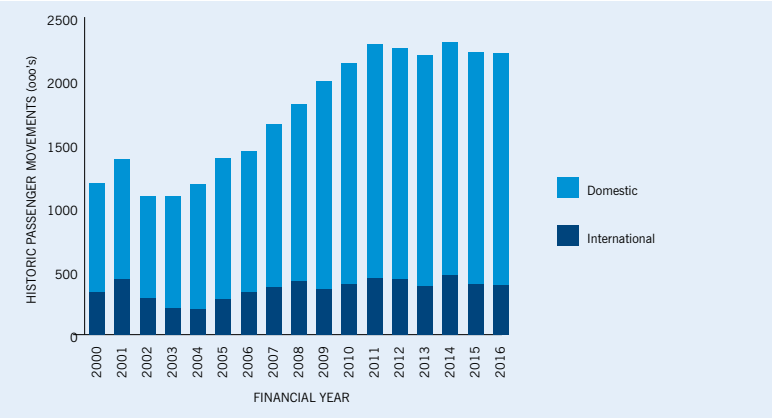
Improving air access across the NT is one of the key aims of DIA's route development strategy, creating options not only for Territory travellers, but for important inbound tourist and business segments.

RECENT PERFORMANCE

Due to DIA's relatively small passenger base, the addition of new services or suspension of existing services has a major impact on growth. This has been demonstrated several times in the past, for example the collapse of Ansett in 2001. More recently the uncertainty of the global economic climate has effected leisure and business markets.

Between 2004 and 2010, passenger numbers at DIA grew strongly, doubling to more than 2 million passengers per year. This growth was during a period of significant change in the airline industry. Since the last master plan was developed in 2010, passenger numbers have continued to grow, however this growth has been less aggressive compared to previous years. In 2016, total passenger numbers at DIA reached over 2.2 million per year. Domestic passengers currently account for approximately 80% of total passenger numbers, with international passengers making up the remaining 20%.

FIGURE 6: HISTORICAL PASSENGER MOVEMENTS



Since the 2010 Master Plan, the mix of airlines servicing Darwin has diversified. In 2010, Low Cost Carriers (LCCs) provided the majority of DIA airline capacity, with the Qantas Group as a whole operating some 85% of total capacity. The past five years has seen a reduction in the proportion of LCCs servicing Darwin, and an increase in full service airline capacity.

DIA has also attracted new international services from Silkair, Malaysia Airlines, Philippine Airlines and AirAsia, providing significant growth for a market of Darwin's size.

Traffic Performance

International

DIA has continued its evolution from a regional Australian airport with limited international services to a true gateway airport that capitalises on its key position in a growing tourism, trade and travel market between Asia and Australia. With all of South East Asia's hubs – and all of Australia's major population centres – located less than five hours' away, Darwin lies within narrowbody aircraft range of all of South East Asia and Australia.

In 2010, almost 90% of international seat capacity at DIA was provided by LCCs. With the introduction of new airlines – including full service carriers – to the Darwin market in the years since then, there is now a much more even spread of passenger services with 50% LCC and 50% full service offerings.

2012 saw the introduction of Silkair services to Singapore, followed in 2013 with the commencement of services by Philippine Airlines and the reintroduction of services by Indonesia AirAsia and Malaysia Airlines, further strengthening Darwin's connections to South East Asia.

As can be seen in Figure 6, international passenger movements have fluctuated over the past decade, peaking at 465,000 in 2014. International passenger growth between the Northern Territory and Asia has been driven largely by Northern Territory resident travel, accounting for over 60% of passengers.

Domestic

Since the 2010 Master Plan, the domestic airline market has seen a number of developments. Domestic airline passenger movements at DIA have grown by a compound average of 5.1% per year over the past decade to 2016, from 1.1 million to over 1.8 million passengers. This growth can be attributed to:

- Over the past five years Virgin Australia has more than doubled its services to Darwin, now operating over 30 services per week. Virgin Australia has also repositioned itself in the airline market as a Full Service Carrier (FSC) rather than a LCC.
- Qantas Airways has introduced greater frequency on a number of its existing services to and from Darwin. The airline has recently retired its Boeing 767 aircraft on domestic sectors, replacing these with higher frequency Boeing 737 operations.
- Territory-based Airnorth has expanded into markets such as Townsville, and replaced Qantas Airways on services to Gove and Cairns.

With an increase over the past five years of FSCs servicing Darwin, the number of 'back-of-clock' flights to the Southern states has reduced as there has been a shift towards daytime operations.

Market Composition

International

Darwin's passenger mix consists of arriving and departing point-to-point passengers, as well as transit and transfer traffic.

In 2015/16, 30% of international passengers for which Darwin was the port of clearance were from Europe, with a further 12% from the United Kingdom. Visitors from DIA's key ASEAN markets of Singapore, Philippines, Indonesia and Malaysia accounted for a further 23% (combined), and Darwin enjoyed 8.6% compound annual growth in visitors from Asia between 2011 and 2015.

In 2015/16, more than 60% of international passenger movements to/from Darwin were generated by residents of the Northern Territory. Bali is a popular holiday destination from Darwin, and the NT's culturally diverse population generates a significant amount of Visiting Friends and Relatives (VFR) traffic to the Philippines, Malaysia, India and Singapore.

Domestic

Brisbane remains Darwin's busiest domestic route and is served by all four Australian domestic airlines (Qantas, Jetstar, Virgin and Tigerair). Sydney, Melbourne and Adelaide are also significant markets for Darwin, and Perth has grown strongly over the past 4 years on the back of increased resource-driven business travel.

Freight

There are presently no dedicated international airfreight services at DIA. There is currently one dedicated domestic narrowbody airfreight service, and domestic airfreight also continues to be carried in the cargo hold of passenger services.

General Aviation

In recent times, General Aviation activities have been highly volatile with growth differing amongst the various categories of General Aviation flying. The General Aviation hours flown in the Northern Territory have decreased from 164.7 hours in 2008 to 155.9 hours in 2013, a reduction of 5.3%. In 2013, Charter flights accounted for 52% of total flying hours in the Northern Territory. Aerial work was the second highest with 30% and Business and Private flying activity accounting for 6% each.

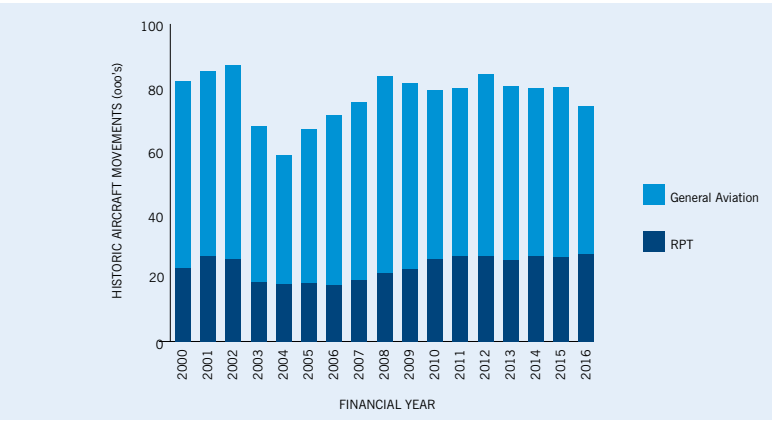
Aircraft Movements

Over the past ten years, RPT aircraft movements at DIA have increased by a compound annual growth rate of 4.47%. As can be seen in Figure 7, in 2006 there were some 17,700 RPT movements, increasing to 27,400 in 2016.

In comparison, General Aviation aircraft movements have been more volatile over the past decade. In 2006, 53,600 General Aviation aircraft movements were recorded, with this figure peaking to 62,000 in 2008, and decreasing to 46,600 movements in 2016. This decrease has been due to reduced

economic activity and the exit of several General Aviation operators from the Darwin market in recent years.

FIGURE 7: HISTORICAL AIRCRAFT MOVEMENTS



FORECAST METHODOLOGY

The forecasts outlined below are produced by Tourism Futures International (TFI) in consultation with DIA. Due to growth being driven by capacity in the short term, the next five year growth forecasts are based on likely operating capacity. Beyond the first five years, a model (developed over many years for forecasting Australian airport growth) was used. For the international market estimates of the responsiveness of passenger traffic to general economic activity (generally measured by Gross Domestic Product (GDP), airfares and exchange rates were used. The main influences on domestic growth are Australian GDP and airfares.

Low, central and high forecasts have been developed for both passenger and aircraft movements. The low and high forecasts represent the likely lower and upper bands of growth to 2037. The central forecasts represents the most likely growth scenarios and provides the basis for the planning throughout this document.

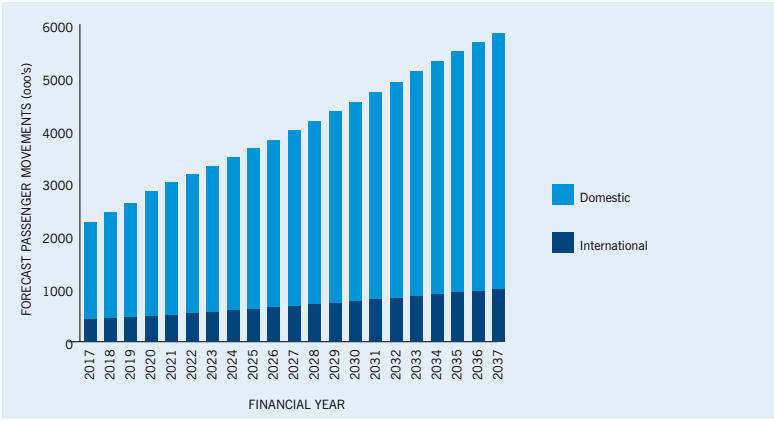
TRAFFIC FORECASTS

Passenger Movements

DIA's passenger movements are heavily driven by airline capacity developments in line with international and domestic airline strategies for the Darwin market.

It is projected that total passenger movements, including transit and transferring passengers, will increase from just over 2 million passengers to almost 6 million passengers by 2037 (refer Figure 8). This forecast continues the current trend of passenger movements being comprised of approximately 80% domestic passengers and 20% international passengers.

FIGURE 8: FORECAST PASSENGER MOVEMENTS



Freight

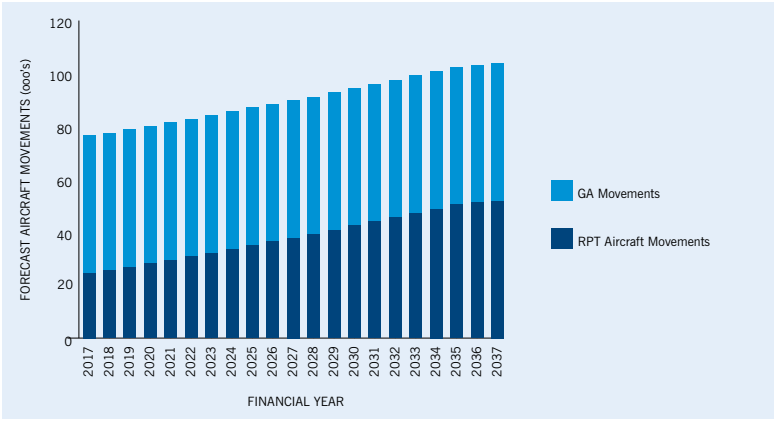
There is limited data available on the total amount of freight carried by air to and from Darwin, particularly on domestic routes. The Bureau of Infrastructure, Transport and Regional Economics data shows that 413 tonnes of freight was carried on international services to and from Darwin in 2014-15. When compared against other airports of a similar size, this volume of international freight is fairly low.

Domestic airfreight will continue to be carried predominantly in the cargo hold of passenger services. As domestic airline movements increase, this will generate additional capacity for domestic freight uplift.

Aircraft Movements

It is projected that combined aircraft movements at DIA will grow from approximately 74,000 movements currently to over 100,000 movements per year by 2037 (refer Figure 9).

FIGURE 9: FORECAST AIRCRAFT MOVEMENTS



It is forecast that RPT aircraft movements at DIA will more than double during the planning period to a total of 51,000 movements per year by 2037. In comparison, General Aviation growth is expected to be limited, with a small increase to 52,000 movements per year by the end of the planning period.

SECTION 8

Airport Land Use

8

- Land use planning is fundamental to an airport master plan and is specifically highlighted in the *Airports Act 1996*.
- Land use planning in the 2017 Master Plan:
  - Ensures there is adequate land for expansion of aviation activity
  - Clearly separates aeronautical and non-aeronautical uses
  - Is consistent with the Northern Territory Planning Scheme were possible, with any variations being highlighted
  - Provides a considerable amount of land for conservation reserves

SECTION 8

Airport Land Use

Darwin International Airport (DIA) incorporates 311 hectares of airport lease area plus 215 hectares of joint-user airside area. The airport lease area is high-value and centrally located land in the Darwin region. DIA is first and foremost an airport for airlines and General Aviation operations. Airport land use planning focusses firstly on preserving adequate land for current and future aviation operations and secondly on land with commercial potential.

COMMERCIAL DEVELOPMENT OPPORTUNITIES

DIA has identified the following aeronautical and non-aeronautical commercial property opportunities:

- Office accommodation
- Retail, big box retail and warehousing companies that would benefit from a central Darwin location with exposure and access
- Meeting centres, accommodation facilities, and other social support / health facilities
- High technology industry that value timely manufacturing and supply
- Industries that rely on good logistical support (e.g. Defence, mining, energy)
- Industries that process and produce time-sensitive products
- Air, road and other transport base industries
- Administration of service industries.

AIRPORTS ACT 1996 AND ASSOCIATED REGULATIONS

Airports Act 1996

The *Airports Act 1996* requires the Master Plan to specify DIA's intentions for the land use and related development of the leased area of the airport site where uses and developments embrace airside, landside, surface access and land planning/ zoning aspects. The Land Use Zones and Land Use Zone Plan, shown in Figure 3 have been developed observing this.

Consistency with the Northern Territory Planning Scheme

Part 5.02(2) of the Airport Regulations 1997 states: '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.'

In this regard where possible the Land Use Zones and the Land Use Zone Plan have been developed in an amount of detail and using terminology and definitions consistent with that of the Northern Territory Planning Scheme.

Definitions of Intended Land Uses are contained in Section 20.

Pre-Existing Interests

Part 5.02(3) of the *Airport Regulations 1997* requires that any obligations or interests at DIA are addressed. Existing interests are listed below:

- Two electricity supply easements to Power and Water Corporation
- Two electronic communications easements to Telstra Corporation Limited
- Electricity supply easement granted to the Department of Defence – RAAF Base Darwin
- Water supply easement granted to the Department of Defence – RAAF Base Darwin
- Access easement granted to the Department of Defence – RAAF Base Darwin.

NATIONAL AIRPORTS SAFEGUARDING FRAMEWORK

The National Airports Safeguarding Framework (NASF) has been developed by the National Airports Safeguarding Advisory Group to provide guidance on planning requirements for development that affects aviation operations. The group comprises representatives from Commonwealth Infrastructure and Defence departments and aviation agencies; state and territory planning and transport departments, and the Australian Local Government Association.

The Australian Government recognises that responsibility for land use planning rests primarily with state, territory and local governments, but that a national approach can assist in improving planning outcomes on and near airports and under flight paths.

The Framework was released in July 2012, providing a national regime for land use planning around airports in Australia and aims to:

- 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.
- Improve community amenity by minimising noise-sensitive developments near airports, including through the use of additional noise metrics.
- Improve aircraft noise-disclosure mechanisms.

The NASF is comprised of a key set of Principles and Guidelines:

NASF Principles

Principle 1: The safety, efficiency and operational integrity of airports should be protected by all governments, recognising their economic, defence and social significance.

Principle 2: Airports, governments and local communities should share responsibility to ensure that airport planning is integrated with local and regional planning.

Principle 3: Governments at all levels should align land use planning and building requirements in the vicinity of airports.

Principle 4: Land use planning processes should balance and protect both airport/aviation operations and community safety and amenity expectations.

Principle 5: Governments will protect operational airspace around airports in the interests of both aviation and community safety.

Principle 6: Strategic and statutory planning frameworks should address aircraft noise by applying a comprehensive suite of noise measures.

Principle 7: Airports should work with governments to provide comprehensive and understandable information to local communities on their operations concerning noise impacts and airspace requirements.

NASF Guidelines

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 in to the Protected Airspace of Airports

Guideline G: Protecting Aviation Facilities – Communication, Navigation and Surveillance

Guideline G was introduced into the Framework in November 2016. A guideline relating to public safety zones is currently under development.

DIA is committed to continuing the consideration of the NASF guidelines in its airport planning and development. Further detail on the guidelines can be found in Section 10 (Guidelines B-G, excluding Guideline D) and Section 11 (Guideline A).

LAND USE ZONES

Land Use Zones for the airport land apply to areas on the Land Use Zone Plan as shown in Figure 3. These are based on known airport land use needs and current market trends. The administration of the zones aims to assist and encourage progressive, orderly and strong growth of the airport land. The zones have been categorised into:

- aviation and aviation related uses
- interim uses
- non-aviation uses.

Where possible the zones and associated permitted and discretionary uses of the Northern Territory Planning Scheme have been adopted as zones and intended uses.

Potential land uses can proceed through the normal environmental and building control (and major development plan if necessary) processes, except where a specific potential use is denoted as a 'sensitive development' in which case the process at Section 89A of the *Airports Act 1996* applies.

Where there are inconsistencies between existing land uses and land uses proposed in the zone, the existing uses may continue. Further development of the existing uses may be consented to by DIA and be regarded as an additional permissible form of the existing use.

In overview terms, land use planning in the 2017 Master Plan:

- ensures there is adequate land for expansion of aviation activity
- clearly separates aeronautical and non-aeronautical uses
- has been developed using terminology and definitions that are consistent with that of the Northern Territory Planning Scheme where possible, with any variations being highlighted
- provides a considerable amount of land for conservation reserves.

Development in any land use zone will have regard to AS2021:2015 (Acoustics – Aircraft noise intrusions – Building siting and construction) and the endorsed Joint Civil-Military 2042 ANEF (refer Figure 14). Any development application to the Airport Building Controller (ABC) must comply with the relevant noise standards.

Application to Acquire or Incorporate Defence Land

DIA has applied to the Department of Defence to:

- acquire various parcels of land
- land swaps to rationalise holdings.

DIA will be applying to the Department of Infrastructure and Regional Development to vary its lease under the *Airports Act 1996* to incorporate any changes resulting from the land transactions with Department of Defence once land issues are finalised.

DIA is currently in negotiations with the Department of Defence and other relevant Commonwealth agencies to lease two hectares of its land located south of the existing Bunnings development. If this lease proceeds, the land will form part of the Service Commercial Zone as shown on the DIA Land Use Zone Plan in Figure 3, and will be governed under the *Airports Act 1996*. As with all developments, DIA will give due consideration to the protection of aviation operations.

AVIATION AND AVIATION RELATED USES

Aviation Activities Zone

(This zone is shown as pink on the Land Use Plan)

Primary Purpose

To provide for the future and current aviation operations and requirements of the airport.

Intended Principal Land Uses

- Aviation activities including General Aviation

TABLE 8: TERMINAL AND FACILITIES ZONE

DEVELOPMENT SHOULD	POTENTIAL LAND USES
Provide for an airport terminal and passenger facilities that meet the needs of travellers, airport visitors, the airport workforce and airlines.	• Animal boarding • Aviation activity • Aviation support facility • Business sign • Car park • Child care centre • Fuel depot • General aviation and support facilities • Helipad • Heliport • Hotel • Leisure and recreation • Medical clinic • Motel • Navigational aids • Office • Passenger terminal • Place of worship • Promotion sign • Restaurant • Service station • Shop • Transport terminal • Utilities and infrastructure • Vehicle sales and hire
Not prejudice the safety or efficiency of the airport.	
Provide for buffer zones to accommodate existing and future infrastructure, pedestrian and cycle links, signs, lighting and landscaping.	
Promote community safety in building design, having regard to adjacent and nearby uses.	
Ensure that adequate car parking is provided.	

INTERIM USES

Aviation Reservation Zone

(This zone is shown as rusty red on the Land Use Plan)

Primary Purpose

To provide for the potential future expansion of Aviation and Aviation Related Uses.

Intended Principal Land Uses

- Interim uses that do not conflict with future aviation and aviation related uses

TABLE 9: AIRPORT RESERVATION ZONE

DEVELOPMENT SHOULD	POTENTIAL LAND USES
Facilitate compatible and ancillary uses within the zone that do not conflict with Aviation and Aviation Related Uses or render the land unfit for Aviation and Aviation Related Uses when it is required for this use. Not prejudice the safety or efficiency of the airport. Provide for buffer zones to accommodate existing and future infrastructure, pedestrian and cycle links, signs, lighting and landscaping. Promote community safety in building design, having regard to adjacent and nearby uses. Ensure that adequate car parking is provided.	• Animal boarding • Aviation activity • Aviation support facility • Business sign • Car park • Community centre • Education establishment* • Fuel depot • General aviation and support facilities • Helipad • Heliport • Hostel • Hotel • Leisure and recreation • Licensed club • Light industry • Medical clinic • Motel • Motor body works • Motor repair station • Navigational aids • Office • Passenger terminal • Place of worship • Plant nursery • Promotion sign • Restaurant • Service station • Shop • Short-stay accommodation • Showroom sales • Transport terminal • Utilities and infrastructure • Vehicle sales and hire • Veterinary clinic • Warehouse

* Denotes a 'sensitive development' as defined by Section 71A of the *Airports Act 1996*.

NON-AVIATION USES

Commercial Zone

(This zone is shown as magenta on the Land Use Plan)

Primary Purpose

To provide for a range of business, office, retail activities and community uses.

Intended Principal Land Uses

- Office
- Retail (shops)

TABLE 10: COMMERCIAL ZONE

DEVELOPMENT SHOULD	POTENTIAL LAND USES
Encourage a range of activities that would benefit from a location in close proximity to the airport and its terminal area. Not prejudice the safety or efficiency of the airport. Respect the amenity of the adjacent and nearby uses. Promote community safety in building design, having regard to adjacent and nearby uses. Provide for buffer zones to accommodate existing and future infrastructure, pedestrian and cycle links, signs, lighting and landscaping. Ensure that adequate car parking is provided.	• Business sign • Car park • Child care centre • Community centre • Hostel • Hotel • Leisure and recreation • Licensed club • Medical clinic • Motel • Motor repair station • Navigational aids • Office • Passenger terminal • Place of worship • Plant nursery • Promotion sign • Restaurant • Service station • Shop • Showroom sales • Utilities and infrastructure • Vehicle sales and hire • Veterinary clinic

Service Commercial Zone

(This zone is shown as orange on the Land Use Plan)

Primary Purpose

To provide commercial activities, which because of the nature of the business or size of the population catchment, require large sites.

Intended Principal Land Uses

- Office
- Retail (shops)
- Showroom sales
- Warehouse

TABLE 11: SERVICE COMMERCIAL ZONE

DEVELOPMENT SHOULD	POTENTIAL LAND USES
Allow for a range of land uses including showroom sales and warehouse but will not by the nature of their operations detrimentally affect the amenity of the adjoining or nearby land developments.	• Business sign • Car park • Child care centre • Community centre • Education establishment* • Hostel • Hotel • Leisure and recreation • Licensed club • Light industry • Medical clinic • Motel • Motor body works • Motor repair station • Navigational aids • Office • Passenger terminal • Place of worship • Plant nursery • Promotion sign • Restaurant • Service station • Shop • Short-stay accommodation • Showroom sales • Transport terminal • Utilities and infrastructure • Vehicle sales and hire • Veterinary clinic • Warehouse
Not prejudice the safety or efficiency of the airport.	
Promote community safety in building design, having regard to adjacent and nearby uses.	
Provide for buffer zones to accommodate existing and future infrastructure, pedestrian and cycle links, signs, lighting and landscaping.	
Be designed in such a way to protect the amenity of the adjoining or nearby residences on McMillans Road.	
Ensure that adequate car parking is provided.	
Recognise the requirement for a 20 metre wide native landscaping corridor abutting Bagot and McMillans Roads and extending from Osgood Drive to Charles Eaton Drive.	

* Denotes a 'sensitive development' as defined by Section 71A of the *Airports Act 1996*.

Tourist Commercial Zone

(This zone is shown as teal on the Land Use Plan)

Primary Purpose

To provide for uses or development servicing tourism, including commercial activities.

Intended Principal Land Uses

- Hostel
- Hotel
- Motel
- Short-stay accommodation

TABLE 12: TOURIST COMMERCIAL ZONE

DEVELOPMENT SHOULD	POTENTIAL LAND USES
Be of a scale and character compatible with uses or development nearby.	• Business sign • Caravan park • Car park • Community centre • Hostel • Hotel • Leisure and recreation • Licensed club • Medical clinic • Motel • Navigational aids • Office • Passenger terminal • Place of worship • Plant nursery • Promotion sign • Restaurant • Service station • Shop • Short-stay accommodation • Utilities and infrastructure • Vehicle sales and hire
Not prejudice the safety or efficiency of the airport.	
Encourage a range of viable tourist/visitor activities that would benefit from a location in close proximity to the airport and its terminal area.	
Promote community safety in building design, having regard to adjacent and nearby uses.	
Provide for buffer zones to accommodate existing and future infrastructure, pedestrian and cycle links, signs, lighting and landscaping.	
Ensure that adequate car parking is provided.	

Conservation Zone

(This zone is shown as green on the Land Use Plan)

Primary Purpose

To conserve, protect and enhance the flora, fauna and character of natural areas within the airport land.

Intended Principal Land Uses

- Nature Reserve
- Recreation

TABLE 13: CONSERVATION ZONE

DEVELOPMENT SHOULD	POTENTIAL LAND USES
Be sensitive to the natural features and habitats of the zone and be so sited and operated to have minimal impact on the environment.	• Business sign • Leisure and recreation • Navigational aids • Restaurant • Shop • Utilities and infrastructure
Ensure that the clearing of native vegetation does not unreasonably contribute to environmental degradation of the locality.	
Avoid impacts on environmentally significant or sensitive vegetation.	

Public Safety Zones

With exception of the Restricted Development Zone in the Northern Territory Planning Scheme, no legislation or guidelines exist at a Commonwealth or Territory level governing permissible land use with respect to aircraft crash risk. Off airport, land use zoning falls within the jurisdiction of the Northern Territory Government. On airport, issues related to crash risk are considered by DIA in the approval process when assessing a proposed development. The proposed on airport land uses contained within this Master Plan are considered to be appropriate.

The National Airports Safeguarding Advisory Group (NASAG) is currently developing guidance regarding public safety zones, that will ultimately form part of the National Airports Safeguarding Framework (NASF) Guidelines.

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SECTION 9

Airfield Development Concept

- No runway upgrading is required during the 20 year planning period.
- Taxiway enhancement will be required to support increased traffic to service expanded aircraft apron areas.
- The main aircraft apron will continue to expand in a linear manner then wrap further around the terminal to the north-west.

SECTION 9

Airfield Development Concept

The airfield consists of runways, taxiways and aircraft aprons. The Master Plan provides for further development of the airfield to ensure efficient handling of the forecast aircraft traffic.

The Darwin International Airport (DIA) runway system is not located within the civil lease and is the responsibility of the Department of Defence in accordance with the joint-user deed. Civil aircraft access the system by means of taxiways leading from the civil area. The runway system at the airport consists of two intersecting runways. A main East/West orientated runway (11/29) and a shorter North/South runway (18/36). The runways are supported by a system of taxiways, parking aprons and other supporting infrastructure.

DIA is a counter-terrorist first response airport and therefore stringent security requirements must be met by both the airport operator and businesses that work at the airport. All activities at the airport are subject to the security controls detailed in the *Aviation Transport Security Act 2004* and Regulations along with DIA's Transport Security Program (TSP).

PLANNING STANDARDS

Civil aerodrome planning for the airport adheres to Civil Aviation Safety Regulation 139 (CASR 139) and CASA Manual of Standards Part 139 (MOS 139). This standard follows accepted International Civil Aviation Organisation (ICAO) methodology of using a code system, known as the Aerodrome Reference Code. The code is composed of two elements: a code number and a code letter.

The code number indicates the runway type and is related to the length of the runway (see Table 14 below).

The code letter is related to the aeroplane wing span and outer main gear wheel span. The planning of aprons and taxiways is largely based on this element (see Table 15 below).

DESIGN AIRCRAFT

Runway 11/29

The design aircraft for the main runway is a Code 4E aircraft. This allows for A330, B747, B777, B787 aircraft types.

The Airbus A380 aircraft is categorised by ICAO and CASA MOS 139 as a Code F with a wingspan of 80 metres. This aircraft is currently in service at major international airports in Australia. Although, it is not expected that Code F aircraft will operate regularly into Darwin, there have been Code F diversions and cargo operations.

Runway 18/36

The design aircraft for the secondary runway is a Code 3C aircraft (surveyed to Code 2 specifications). This allows for E120, Q300, SF340 and other General Aviation (GA) aircraft types.

TABLE 14: CODE NUMBER

CODE NUMBER	1	2	3	4
Aeroplane reference field length	Less than 800m	800m up to but not including 1200m	1200m up to but not including 1800m	1800m and over

TABLE 15: CODE LETTER

CODE LETTER	A	B	C	D	E	F
Wingspan	Up to but not including 15m	15m up to but not including 24m	24m up to but not including 36m	36m up to but not including 52m	52m up to but not including 65m	65m up to but not including 80m
Outer main gear wheel span	Up to but not including 4.5m	4.5m up to but not including 6m	6m up to but not including 9m	9m up to but not including 14m	9m up to but not including 14m	14m up to but not including 16m

MOVEMENT AREAS

The existing airfield layout is shown in Figure 1.

Runways

DIA has two runways that are owned by the Department of Defence. The dimensions and declared distances of these runways are given in Table 16 below.

11/29

The main runway, with an orientation of 11/29, has a length of 3,354 metres and a width of 60 metres. It is a flexible pavement runway and is grooved for the central 45 metre portion.

Operations on Runway 11 versus Runway 29 vary in accordance with the prevailing winds. The runway is equipped with a cable arrestor system, designed for specific military aircraft and is not used by civil aircraft.

Land and Hold Short Operations (LAHSO) are available on Runway 29 to allow continuous use of Runway 18/36.

Runway 29 is equipped with a High Intensity Approach Lighting (HIAL) System – CAT I, which is designed to smooth the transition from instrument to visual flight on a precision instrument approach in conditions of low cloud or reduced visibility.

The main runway is also fitted with a 6 stage high intensity runway edge and threshold lighting. A Precision Approach Path Indicator (PAPI) also services both ends.

18/36

The crosswind runway has an orientation of 18/36, with a length of 1,524 metres and a width of 30 metres. As with the main runway, under the joint-user deed, the Department of Defence is responsible for maintaining this runway.

Civil use of this runway largely comprises general aviation movements. Runway 18/36 is predominantly used for departures on runway 18 and landings on Runway 36. Landings on Runway 36 often involve Land and Hold Short Operations before aircraft clear Runway 11/29. There are restrictions on Runway 18/36 operations when high explosives are on Ordnance Loading Apron 9 in the Department of Defence area.

Helicopters

A heliport is located at the east end of Taxiway U.

TABLE 16: RUNWAY DATA

RUNWAY DIRECTION	LENGTH (M)	WIDTH (M)	TAKE-OFF RUN AVAILABLE (M)	TAKE-OFF DISTANCE AVAILABLE (M)	ACCELERATE STOP DISTANCE AVAILABLE (M)	LANDING DISTANCE AVAILABLE (M)
11	3354	60	3354	3444	3354	3354
29	3354	60	3354	3444	3354	3354
18	1524	30	1524	1584	1524	1524
36	1524	30	1524	1584	1524	1524


←1690
E2 29-11

Taxiways

Runways are supported by a comprehensive taxiway system designed to facilitate the efficient movement of aircraft between the runways and apron areas. Refer to Table 17: Taxiway Data below.

APRONS

Aprons are areas provided for aircraft parking. Aircraft apron areas also support activities associated with the servicing of aircraft such as baggage, freight, refuelling and flight catering, and utilise a variety of ground service equipment (GSE) operated by third parties.

An aircraft parking position is known as an aircraft stand (or bay). Existing aprons at DIA accommodate a full range of aircraft types and operations.

Regular Public Transport (RPT) Apron

The regular public transport (RPT) apron can accommodate up to 17 large aircraft in various combinations. All parking bays on the RPT apron are common use. In 2014, Code C bays 23 to 25 were constructed.

Five of the bays (Bay 1 to 5) are accessed by aerobridges to the terminal. Bay 1 is capable of servicing A380 aircraft. Bays 1 and 5 have apron drive aerobridges. Bay 2, 3 and 4 are equipped with "fixed T head" aerobridges. Bays 1 to 8 and Bays 21 to 25 are equipped with fuel hydrants.

A Ground Power Unit is located on Bay 5 for airline use.

The RPT apron is located within a Security Restricted Area (SRA).

General Aviation Aprons

General aviation (GA) includes all parts of aviation industry that engage in activity other than scheduled commercial airline activity. This may include charter operations, aeromedical operations, agricultural aviation businesses, aviation-based fire fighting services, training and aerial work such as aerial photography and surveying. It also includes private, business, recreational and sports aviation activity and supporting businesses such as maintenance providers.

Currently there are three designated GA areas providing around 89,000m^2 of hangarage and 74,000m^2 of aircraft parking space. An estimated 160 GA and 14 regional aircraft are currently based in these areas. Around 30 businesses and a number of private individuals operate from these facilities.

TABLE 17: TAXIWAY DATA

TAXIWAY	WIDTH/AIRCRAFT CODE	PAVEMENT CONCESSION NUMBER (PCN) / RESTRICTIONS	RESPONSIBILITY/LEASED AREAS
A1-6	23m + 3m shoulder	PCN 81. Parts of taxiway unavailable for use by civil aircraft when Bomber Replenishment Apron (BRA) or Fighter Replenishment Apron (FRA) are occupied by armed aircraft . This may require backtracking on Runway 11/29.	Jointly Used Area
B1	23m + 3m shoulder	PCN 81	Jointly Used Area
B2	23m + 10.5m shoulders	PCN 81	Darwin International Airport
C1	Varies 15m to 23m	PCN 18, refer Note 1	Jointly Used Area
C2	23m + 13m shoulder eastern side	PCN 81, refer Note 1	Jointly Used Area
C3	23m + 14m shoulders	PCN 81, refer Note 1	Jointly Used Area
C4	23m	PCN 81, refer Note 1	Jointly Used Area
D	23m + shoulders varying between 3m and 12m	PCN 81	Jointly Used Area
E1	23m + 3m shoulder	PCN 81	Jointly Used Area
E2	23.0m + 10.5m shoulders	PCN 81	Darwin International Airport
U1	15.0m	MTOW 60,000kg refer Note 2	Darwin International Airport
U2	15.0m	MTOW 60,000kg	Darwin International Airport
V1	15.0m + 3.0m shoulders	MTOW 22,000kg	Darwin International Airport
V2	11.0m	MAX wingspan 24m	Darwin International Airport
Y1	9.0m	MTOW 5,700kg, MAX wingspan 15m	Darwin International Airport
Z	15m + 3.5m shoulders	MTOW 22,000kg, MAX wingspan 35.8m	Darwin International Airport
G,H,J,K,L,M	Various	TWY K, L PCN 18	Department of Defence

Notes

1. Taxiway C is west of and runs parallel to Runway 18/36 and also provides access for heavy aircraft to the military apron areas; Taxiway C4 is on the northern side of Runway 11/29 providing access to Runway 18/36 and is not marked with taxiway edge lines.
2. Taxiway U1 east of Taxiway U2 is restricted to helicopter only (fixed wing operations allowed with DIA approval).

GA operations are clustered into 3 distinct areas:

1. An area to the north of Slade Court bounded by Murphy Road – known locally as the Northern GA area.
2. An area to the south of Slade Court and to the east of land reserve by the Department of Defence for a possible extension of Runway 18/36 – known locally as the Southern GA.
3. An area to the east of the passenger terminal bounded by Lancaster Road and beyond that by the Rapid Creek Reserve which, for the purpose of this plan, is identified as the Eastern Aviation area.

Northern GA
The Northern GA apron provides parking for approximately 80 aircraft, the wingspan of which must be less than 15m (Code A aircraft). The apron is flexible pavement with a PCN of 9.

Operations from the Northern GA include charter, light freight transportation and freight forwarding, aerial work, flight training, private flying, business flying, sport aviation and fuel supply AVGAS and Jet A1.

Itinerant aircraft parking is on an opportunity basis in this area.

Southern GA
The Southern GA apron provides parking for around 20 Code B aircraft but may be used by Code C aircraft subject to a pavement concession. The apron is flexible pavement with a PCN of 9.

Operations from the Southern GA include charter, aerial work, aircraft maintenance, hangarage, Coastal surveillance, search and rescue and aero medical services.

Eastern Aviation area (includes private apron and helicopter apron)
Various components make up the Eastern Aviation area.

A private apron area is currently utilised for regional airline and specialist freight operations. This apron caters for Code C aircraft and occupies approximately 26,000m2.

Freight facilities and on airport airline catering facilities are also included. Freight is carried on passenger aircraft and handled directly on the RPT apron but consolidation is completed in the Eastern Aviation area.

Further to the east is the heavy helicopter zone, which provides a Final Approach and Take-Off (FATO) point and a sealed area for parking for six 18-passenger Super Puma helicopters. A non-sealed area is also available for helicopter operations. Typically, small helicopters use the FATO point and heavy helicopters take-off and land on Runway 11/29.

Operations from the Eastern Aviation area include RPT regional jet and turboprop aircraft, charter, heavy freight transportation and freight forwarding utilising domestic and regional airline services and dedicated freight aircraft (these aircraft utilise the RPT apron), hangarage, fuel supply, light and heavy aircraft maintenance, and airline catering. Helicopter activities are located at the eastern end of this area.

CareFlight operate fixed wing aircraft and helicopters for emergency patient transportation. CareFlight operate the Top End Medical Retrieval Service for the Northern Territory Government.

EXISTING SUPPORT SYSTEMS

Department of Defence Facilities
Air Traffic Control (ATC) Services at DIA are provided 24 hours per day by the Department of Defence. The tower is located to the east of the passenger terminal within the civil DIA boundary. The primary role of ATC is the processing and separation of air traffic in both the initial and final stages of flight. ATC also provides surface movement control to aircraft and vehicles on the runways and taxiways.

Department of Defence is planning a new air traffic control tower as part of the joint Defence and Airservices Australia 'OneSKY Australia' program. The preliminary draft Major Development Plan for the project was released for a statutory 60 business day public comment period in November 2016. Following this, the draft Major Development Plan will be submitted to the Minister for Infrastructure and Transport for approval.

Department of Defence is also responsible for the provision and maintenance of the TACtical Air Navigation (TACAN) and the Radar.

Airservices Australia Facilities
Fire and rescue services are provided by Airservices Australia from a facility located to the southwest of the main RPT apron within the DIA lease boundary. The Aviation Rescue Fire Fighting (ARFF) service currently provides up to ICAO Category 8 standard on a 24 hour notice basis. Under agreement with the Department of Defence, ARFF is provided to all aircraft, both civil and military. A fire training area is located south-west of the passenger terminal on Department of Defence land.

Airservices Australia is responsible for the provision and maintenance of radio navigation aids and systems located on or near the airport, including:

- Distance Measuring Equipment (DME)
- Very High Frequency Omnidirectional Radio (VOR)
- Instrument Landing System (ILS) (Glide path and localiser)
- Radar at Knuckey Lagoon which provides a backup to the RAAF primary radar


Virgin
Virgin

DIA will continue to work with Airservices on any future developments at the airport, to ensure there is no impact to Airservices' facilities and operations.

2037 DEVELOPMENT CONCEPT

The 2037 Airfield Development Concept Plan is shown in Figure 10. The planning and delivery of future airfield developments will be undertaken in close consultation with airport stakeholders.

Runways

The capacity of the runway system at DIA is approximately 200,000 movements per year. It is estimated that in 2037 there will be a total of around 104,000 movements, excluding military traffic. The existing runway system is adequate to cater for future projected traffic and is proposed to be retained in its existing configuration. A future runway extension is safeguarded, so that Runway 11/29 can be extended to 4,000m beyond the planning period.

Lengthening of Runway 18/36 is not required for civil operations within or beyond the planning period. Hence the DIA position is that the existing runway extension reserve at the northern end of the runway should be available for aeronautical development, which will be increasingly required. However, the Department of Defence wishes to retain the runway extension reserve in case the land is required for runway expansion in the future. DIA notes that significant civil works would be required to extend Runway 18/36 to the north, to create a level runway. Similarly, the alignment and connection of adjacent taxiways (e.g. Taxiway Y) would need careful consideration, to maintain access into the existing Northern GA and Southern GA apron areas. Any future developments in the land use zones directly surrounding the Runway 18/36 extension area will need to be carefully planned and considered so as not to impact the viability of any future expansion of the runway, nor the line of sight from the ATC tower to the full length of the runway.

Taxiways

The Master Plan concept proposes a number of new taxiway elements by 2037 to support the increase in traffic and support expanded apron areas, including:

- Realignment of Taxiway U across the full apron area to service both active gates and remote apron stands
- Realignment and widening of runway exit Taxiway V2, with extension across Taxiway Z to access future western RPT apron expansion
- Extension of Taxiway Z to provide full length Code E taxiway parallel to and north of Runway 11/29
- Provision of suitable Rapid Exit Taxiways (RETs) for civil use from Runway 11/29 to Taxiway Z
- Development of GA taxiways to service GA apron areas

It is expected that part of the extension to Taxiway Z and the GA taxiway system to serve the western GA development area will be required during the first 10 years of the planning period. It is anticipated that this initial extension to Taxiway Z will occur between Taxiway B and Taxiway D, with a short extension of Taxiway D to the northern side of Runway 11/29 to connect to the extended Taxiway Z. Such an extension would provide greater efficiency of access between the main runway and the RPT apron. Any extension of Taxiway Z will need to resolve any potential conflicts such as navigation equipment location or explosive ordnance safeguard lines that may exist at the time.

RPT Apron

It is estimated that by 2037 the RPT apron will need to accommodate a mix of 37 aircraft parking positions as indicated in Table 18.

TABLE 18: TERMINAL APRON AIRCRAFT PARKING DEMAND

AIRCRAFT	2017	2022	2027	2032	2037
Code C	13	18	18	21	25
Code E	1	2	2	3	3
Total Active	14	16	20	24	28
Code C	4	5	6	7	8
Code E	0	0	0	1	1
Non Active	4	5	6	8	9
Total	18	21	26	32	37

The RPT apron will continue to effectively use the space and infrastructure available, and expand in a linear manner and wrap around the terminal to the northwest until such time that the terminal demand triggers the need to alter this concept to cater for a pier terminal development.

The provision of additional aerobridges to connect the terminal to active (contact) aircraft stands will be considered as both the airfield and terminal building continue to develop and grow, and will be assessed on an as-needs basis.

Freight

It is envisaged that a dedicated freight apron is not required during the planning period. Freight on passenger aircraft or freight services will continue to be facilitated on the main RPT Apron.

There are currently 2-3 tonnes of cold freight storage capacity available on airport (at Qantas Freight's existing facility). There is further land available in the Aviation Activities and Facilities Zone and the Aviation Reservation Zone to accommodate growth at such a time as the demand for cold freight storage outweighs the existing capacity available.

General Aviation

The amount of land in the Aviation Reservation Zone provides a significant area for expansion of the General Aviation facilities both within and beyond the planning period. General Aviation facilities will be developed in line with commercial demand. Increases in helicopter activity continue to be accommodated in the Eastern GA area.

Department of Defence Master Plan

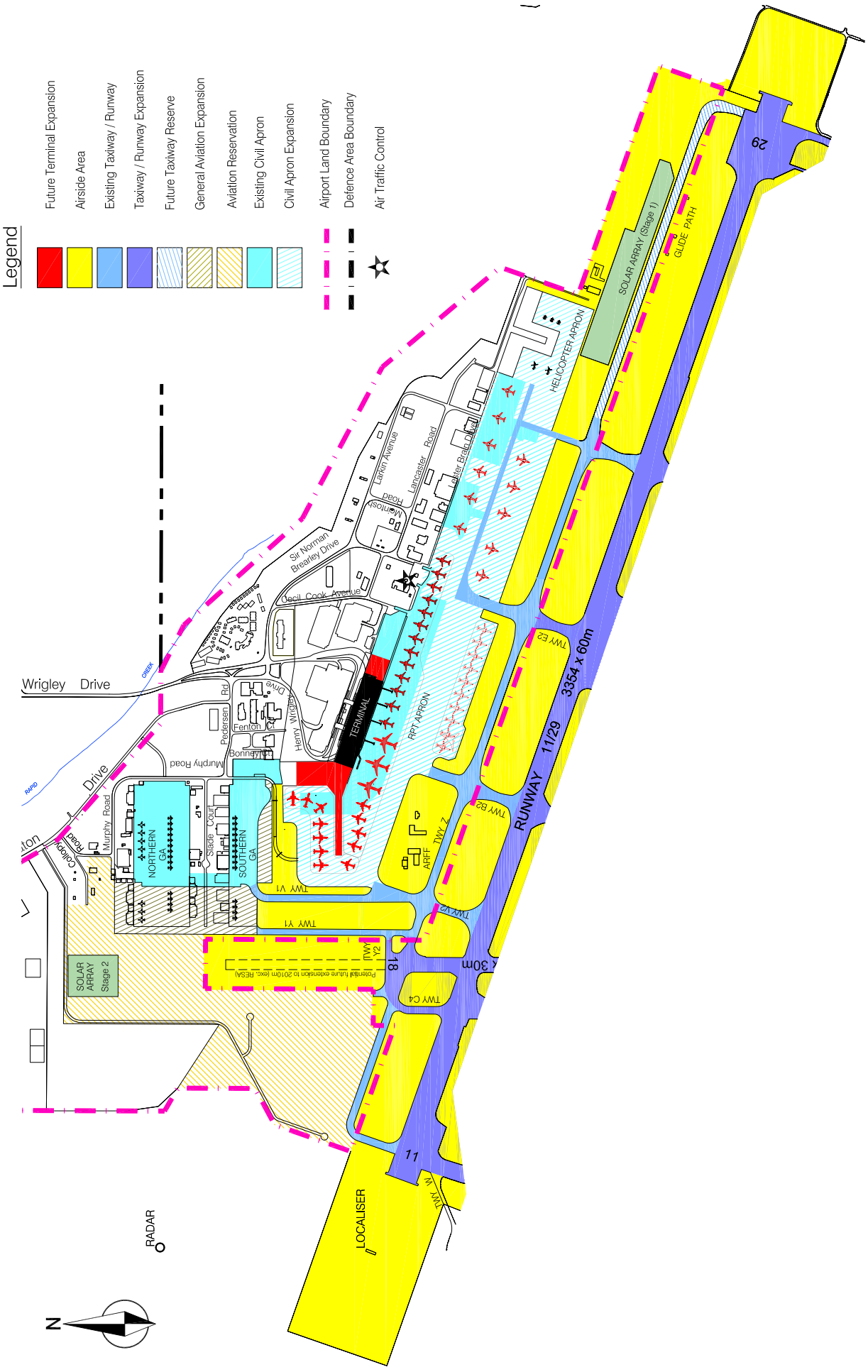
Airfield Concept

The Department of Defence produced a Master Plan in 2008 which they supplied to DIA.

The key recommendations of the Defence Master Plan with respect to the airfield at DIA were as follows:

- Safeguarding the extension of Runway 18/36 to the north, resulting in an overall length of 2,010 metres. (Note that capacity review states that this is not needed for civil use)
- Extension of Taxiway Z to the Runway 29 threshold, to resolve potential civil aircraft taxiing conflicts with Explosive Ordnance (EO) safety zones and navigational equipment
- Extension of Taxiway D across Runway 11/29 to join the extended Taxiway Z
- Provision of a new taxiway crossing Runway 11/29, joining Taxiway A6 to Taxiway Z between Taxiway D and the runway threshold
- Provision of two rapid exit taxiways between Runway 11/29 and Taxiway A, in the approximate location of Taxiway E1
- Extension of the existing Air Traffic Control facilities area.

FIGURE 10: 2037 AIRFIELD DEVELOPMENT CONCEPT



SECTION 10

Protection of Aircraft Operations

10

- Obstacle Limitation Surfaces (OLS) and Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) are prepared for Darwin International Airport to assist with the protection of airspace required for aircraft operations around the airport.
- The Department of Defence protects military aircraft operations through the building controls contained in the *Defence (Areas Control) Regulations 1989*.

SECTION 10

Protection of Aircraft Operations

Buildings and activities in the vicinity of an airport have the potential to create air safety hazards and to seriously limit the viability of aircraft operations into and out of the airport.

AIRSPACE PROTECTION

Part 12 of the *Airports Act 1996* and the Airport (Protection of Airspace) Regulations 1996 declare prescribed airspace and give statutory protection from intrusion into this airspace. For the immediate and long-term operation of Darwin International Airport (DIA), new structures should be designed, or other activities controlled, to ensure that they do not intrude into the present or future protected airspace.

There are Australian Standards for the design of airspace protection surfaces including Civil Aviation Safety Regulations (CASR 1998) and Manual of Standards Part 139 – Aerodromes (MOS Part 139). Under these Standards airspace is prescribed for protection in two categories:

- Obstacle Limitation Surfaces (OLS)
- Procedures for Air Navigation Services – Aircraft Operations (PANS–OPS).

The protection of airspace procedures described below apply to civil aircraft.

NASF Guideline F highlights the importance of these surfaces in protecting the operational efficiency of the airport. In line with these guidelines, DIA has prepared OLS and PANS-OPS charts that define the airport's prescribed airspace. These charts are integral to assessing proposed developments in and around the airport that may intrude on the protected airspace.

DIA is currently preparing to lodge an application with the Department of Infrastructure and Regional Development (DIRD) to formally declare its prescribed airspace under the *Airports (Protection of Airspace) Regulations*.

Obstacle Limitation Surfaces (OLS)

The OLS are a series of surfaces in the airspace surrounding an airport and referenced to each runway.

The broad purpose of the OLS is to define the volume of airspace that should ideally be kept free from obstacles in order to minimise the danger to aircraft during an entirely visual approach or during the final visual segment of an instrument approach procedure. Infringements of these surfaces may be approved subject to a safety analysis and assessments by stakeholders and subject to any conditions imposed.

Figure 11 depicts the OLS associated with DIA for current and future requirements based on the long-term retention of the existing runway geometry.

The military equivalent of OLS is Obstruction Clearance Surfaces (OCS) and is prepared by the Department of Defence. Department of Defence undertake regular assessment to reduce the possibilities of structures infringing on flight tracks. Overall protection of airspace for both civil and military aircraft is a controlled activity (refer below) which requires a joint civil-military effort at a joint-user airport.

Procedures for Air Navigation Services – Aircraft Operations Surfaces (PANS –OPS)

A PANS-OPS surface for an airport is a surface ascertained in accordance with the *ICAO Procedures for Air Navigation Services – Aircraft Operations* (Doc 8168, PANS-OPS).

The PANS-OPS surfaces are intended to safeguard an aircraft from collision with obstacles when the pilot is flying by reference to instruments. The designer of an instrument procedure determines the lateral extent of areas needed for an aircraft to execute a particular manoeuvre. The designer then applies minimum obstacle clearances to structures, terrain or other natural features within that area to determine the limiting altitude at which the manoeuvre can be safely executed. As a result, PANS-OPS surfaces cannot be infringed in any circumstances.

Figure 12 depicts the PANS-OPS associated with DIA for current requirements based on the long-term retention of the existing runway geometry and future changes in navigational aids that determine instrument procedures specific to the runway.

Airspace Protection Planning Control

Any activity (on or off airport) that infringes an airport's protected airspace is called a 'controlled activity' and requires approval before it can be carried out. Controlled activities include the following:

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

The *Airports (Protection of Airspace) Regulations 1996* stipulate that controlled activities need specific approval from DIRD. The Regulations require that proponents of proposed controlled activities must provide DIA with the details of the proposal which are then assessed against the OLS and PANS-OPS.

Likewise, the Department of Defence has statutory protection from intrusion into its airspace through the *Defence (Areas Control) Regulations 1989* [D(AC)R]. The [D(AC)R] for RAAF Base Darwin was established in 1998.

COMMUNICATION, NAVIGATION AND SURVEILLANCE FACILITIES

At DIA there are a number of radio navigation aids, communication installations and radar systems that provide precision and other guidance to aircraft, which are operated by Airservices Australia and the Department of Defence, including the DME, VOR, ILS (glide path and localiser), TACAN and Radar. These systems rely on the transmission of radio waves that must be protected from any structures or obstacles that could cause signal refraction or interference. Consequently, areas surrounding these facilities may have development restrictions. NASF Guideline G provides detailed guidance on the requirements for the building restriction areas around these facilities.

Aircraft utilise airport-based navigational aids for en-route navigation or to make an instrument approach to the airport. Unplanned interruptions to, or degradation of the ground signal, are to be avoided in the interests of safety. Therefore it is necessary to ensure there will be no interference caused to the operation of navigational aids by the erection of structures or work activities within the vicinity of a navigational aid or its associated cables.

To meet the necessary performance requirements, airspace restrictions are established for each item of equipment and procedures. It may be possible under some circumstances to permit infringements of the protective surfaces, without degradation in system performance. Protection of the navigation aids and radar restricted surfaces is managed cooperatively between DIA, Airservices Australia and the Department of Defence.

BUILDING GENERATED WINDSHEAR

It is recognised that buildings and structures positioned close to runways have the potential to impact aviation operations due to building generated windshear. This type of windshear can become a safety issue when a significant obstacle like a building is located in the path of a cross-wind to an operational runway. In such a scenario, the wind flow will be diverted around and over the building, resulting in the cross-wind speed to vary along the runway. Windshear poses the greatest risk on approach, landing and take-off when an aircraft's speed is low and the pilot's ability to respond may be limited. It has been identified that the most critical zone for building positioning in relation to building generated windshear is in close proximity to the touch-down zones of the runways.

In considering the risk of building generated windshear as a result of any future developments, DIA will refer to NASF Guideline B recommendations, that indicate buildings located within the following distances to the runways could pose a risk:

- 1200 metres or closer perpendicular to the runway centre line, or
- 900m or closer in front of the runway threshold, or
- 500m or closer from the runway threshold along the runway.

LIGHTING IN THE VICINITY OF THE AIRPORT

The Civil Aviation Safety Authority (CASA) has the power under the *Civil Aviation Regulations 1988* (CAR 94 – Dangerous Lights) to control ground lights where they have the potential to cause confusion or distraction from glare to pilots in the air. To assist lighting designers and installation contractors in the vicinity of the airport, CASA has established guidelines on the location and permitted intensities of ground lights within a six kilometre radius of airports. External advertising, sport field floodlighting and street lighting are some of the more likely lighting sources requiring consideration.

NASF Guideline E provides further guidance to assist development proponents and planning authorities to ensure that lighting in the vicinity of airports does not compromise aviation safety. DIA has made documentation available indicating the zones around the airport that have maximum permissible lighting intensities.

WILDLIFE HAZARD

Surrounding land use can have the potential to attract problem wildlife species to the airport, increasing the risk of strike incidences. NASF Guideline C provides advice to help protect against such issues.

DIA is required to monitor and control the presence of wildlife on or in the vicinity of the airport in accordance with CASA regulations.

DIA maintains a vigilant Wildlife Hazard Management System to remove and reduce potential high risk bird and animal species. Wildlife hazard management considerations are also taken into account when planning and assessing potential developments at the airport and its surrounds.

FIGURE 11: OLS CURRENT AND FUTURE

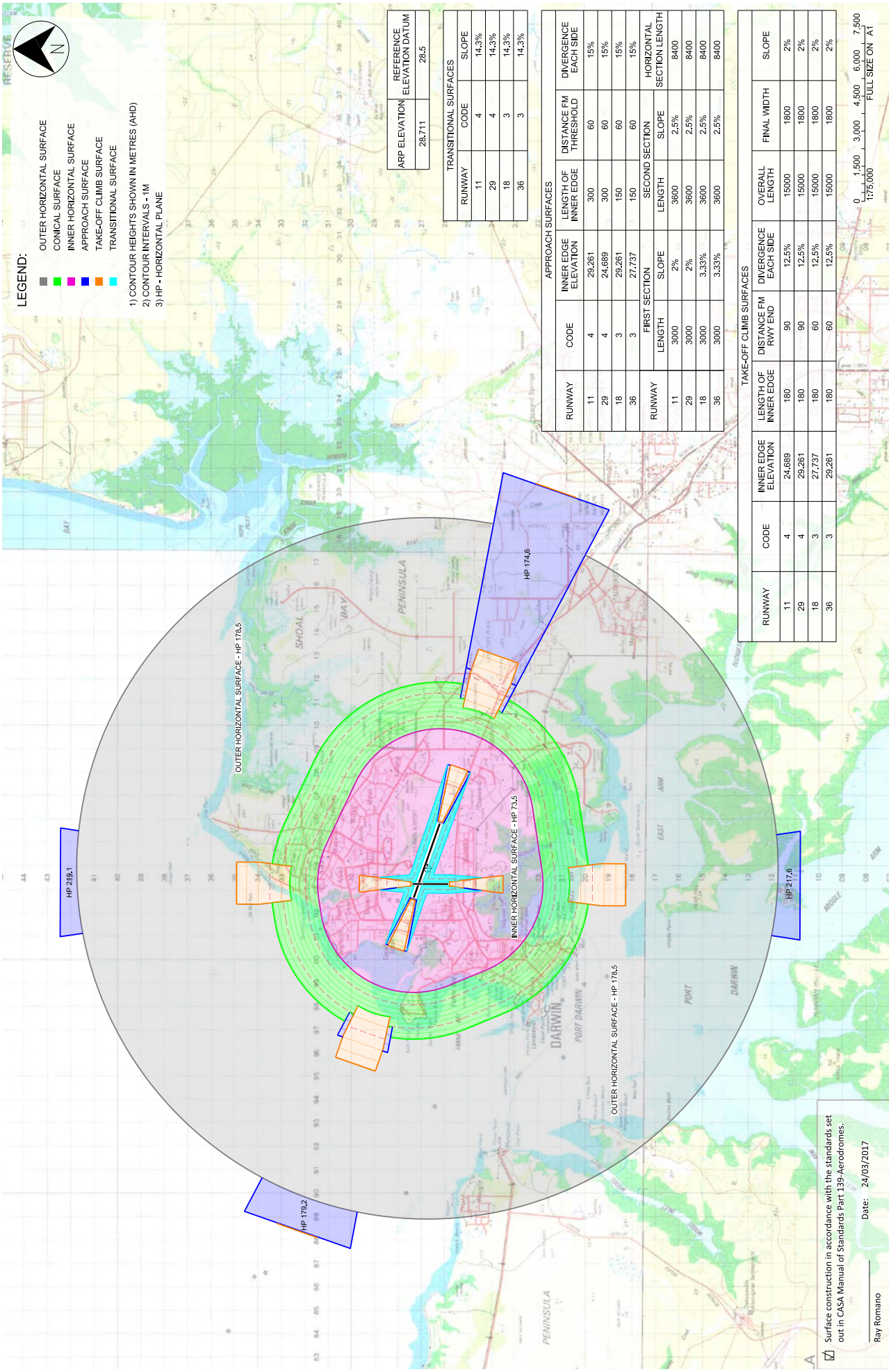
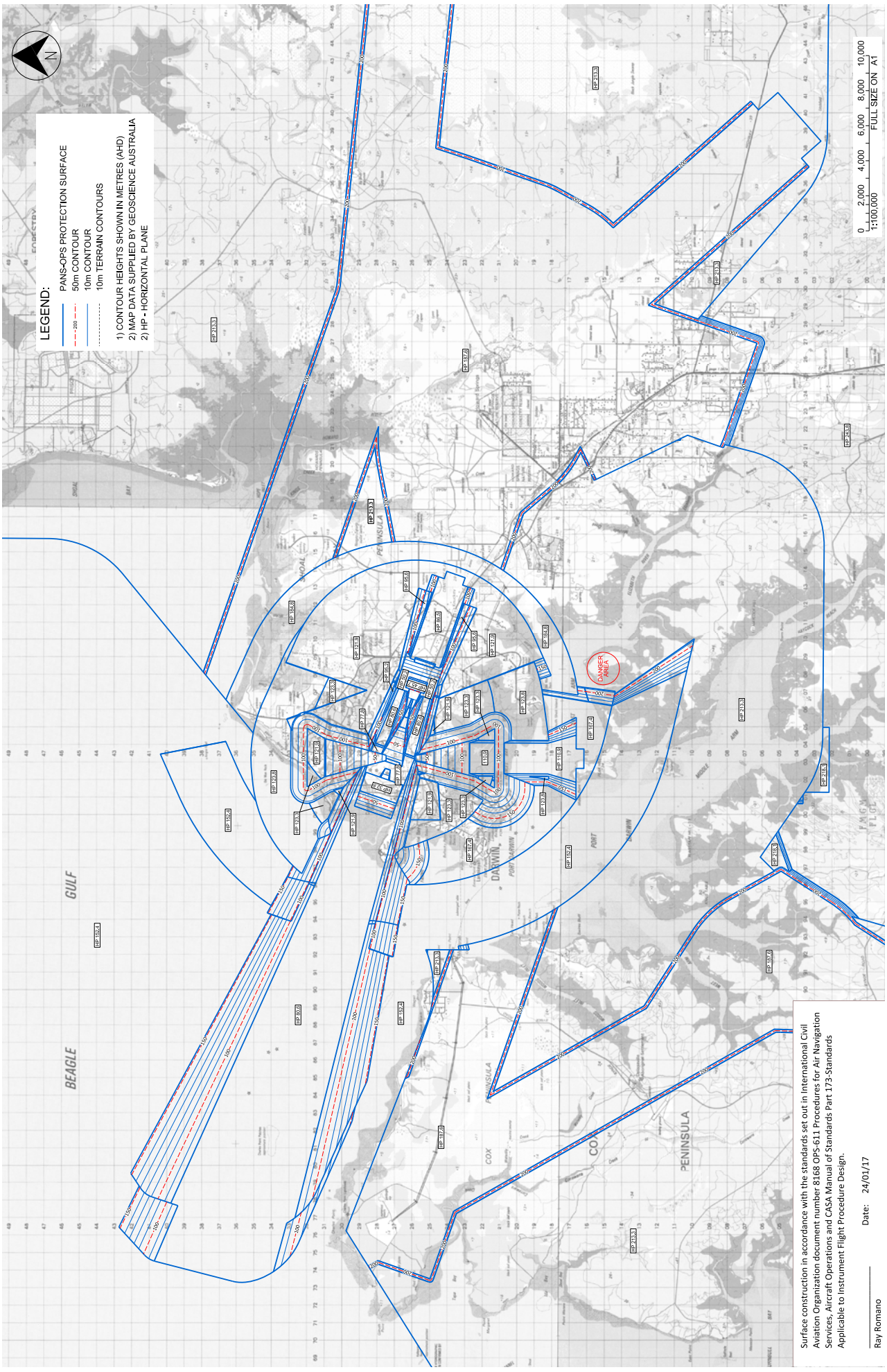


FIGURE 12: DIA CURRENT PANS-OPS



SECTION 11

Aircraft Noise Management

11

- As a joint-user airport, Darwin has military and civil aircraft operations.
- The noise metric used for land use planning and building control is the Australian Noise Exposure Forecast (ANEF).
- This Master Plan incorporates an endorsed joint civil-military 2042 ANEF.

SECTION 11

Aircraft Noise Management

Darwin International Airport (DIA) as the civil airport operator has little direct control over noise produced by aircraft operations other than civil ground running. Airspace management is controlled by Department of Defence.

The International Civil Aviation Organisation (ICAO) has developed standards and guidelines which address civil aircraft noise, referred to as Annex 16. Australian Government aircraft noise legislation reflects the standards developed by ICAO and the obligations placed on Australia as a member of ICAO.

ICAO has set standards for aircraft noise within Chapters 3 and 4 of Volume I Annex 16. Aircraft that comply with these standards are commonly referred to as "Chapter 3 aircraft" or "Chapter 4 aircraft". Chapter 4 aircraft noise standards were adopted in 2006 and any aircraft certificated from that time needed to comply with the more stringent Chapter 4 noise standards. Most civil airline aircraft that operate into Darwin meet Chapter 4 noise standards. There are a number of civil aircraft that only meet Chapter 3 noise standards that operate into Darwin each year. Military aircraft are not subject to ICAO noise standards.

Building approvals external to the airport are the responsibility of the Northern Territory Government. On airport development is under the final approval of the Airport Building Controller under the *Airports Act 1996*.

DARWIN AS JOINT-USER AIRPORT

DIA has been a joint-user airport with shared facilities with RAAF Base Darwin since 1946, including being the home Base for 75 Squadron in the 1980s prior to their relocation to Tindal. Responsibilities between Department of Defence and DIA are set out in the joint-user deed.

Under the joint-user deed the Department of Defence is responsible for producing a joint civil-military Australian Noise Exposure Forecast (ANEF).

AUSTRALIAN NOISE EXPOSURE FORECAST (ANEF)

The Australian Noise Exposure Forecast (ANEF) is a set of contours showing future forecasted levels of exposure to aircraft noise for building control purposes.

The ANEF is an important noise metric because it is the only noise metric which has status under the:

- Northern Territory Planning Scheme for land use planning and development consent off airport, and
- *Airports Act 1996* of the Commonwealth for land use planning and development consent on airport.

The ANEF is used in accordance with Australian Standard AS2021:2015 to guide land use planning and development consent decisions by the relevant authority.

AS2021:2015 does however recognises that the 20 ANEF and 25 ANEF zones do not capture all high noise affected areas around an airport, and the ANEF contours are not necessarily an indicator of the full spread of noise impacts. As such, DIA has incorporated the NASF Guideline A recommendation of additional complementary methods of describing aircraft noise, in particular the frequency based measure of the N-contour system.

The ANEF is subject to technical review and endorsement by Airservices Australia.

ANEF in Land Use Planning and Development Consent

The following table from Australian Standard AS2021:2015 provides guidance for new construction in relation to ANEF contours. "Conditional" means that approval may be given if appropriate noise control features can be incorporated in the construction.

TABLE 19: BUILDING SITE ACCEPTABILITY BASED ON ANEF ZONES

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		

ENDORSED JOINT CIVIL-MILITARY ANEF

The *Airports Act 1996* requires that a standard 20-year ANEF be provided, i.e. a 2037 ANEF for this Master Plan. Long-term (more than 20 years) or ultimate capacity ANEFs can also be incorporated in a Master Plan. This Master Plan presents a 2042 ANEF in order to provide a longer term view of aircraft noise than the minimum required period.

Methodology

An ANEF is a set of noise contours at some point in the future (in this case 2042). The contours were prepared in accordance with the Airservices Australia document "Guidelines for the Production of Noise Contours for Australian Airports" and comply with the "Manner of Endorsement" approved by the Minister for Infrastructure and Regional Development.

ANEF inputs include aircraft movement forecasts, runway and flight path usage, time of day and fleet mix. The ANEF process ensures that forecast traffic is within the aircraft movement capacity of the airport (in this case both civil and military movement forecasts). The ANEF for DIA assumes that there is to be no major changes to the airfield layout, any runway extensions or changes to the current flight patterns within the planning period. The current procedures for aircraft arriving and departing the airport were defined in close consultation with air traffic control.

In developing the Joint Civil-Military 2042 ANEF consideration was given to the appropriate scenario for military movements. The military traffic scenario chosen as the basis for the 2042 ANEF and associated noise metrics is military traffic throughout the year excluding peak exercise periods (e.g. the biennial Exercise Pitch Black and the annual Exercise Aces North).

Although military traffic varies, civil traffic remains relatively stable throughout the year. In developing the civil traffic component of the 2042 ANEF, the following inputs, methodology and assumptions were used:

- For international RPT aircraft movements, the proportion of widebody jet movements will increase from 5% to 17%; narrowbody jet movements will increase from 64% to 74%; regional jet movements will decrease from 28% to 9%. It is forecast that turboprop aircraft movements will reduce from 3% to zero.
- For domestic RPT aircraft movements, the proportion of widebody jet movements will increase from 6% to 25%; narrowbody jet movements will decrease from 70% to 49%; regional jet movements will decrease from 20% to 16%; turboprop and smaller non-jet aircraft movements will increase from 4% to 10%.
- As the ANEF looks at a long term horizon, some aircraft are likely to have been phased out by the RPT airlines by 2042. These aircraft are substituted with a newer aircraft similar in size. For example the B738 and A320 /A321 are likely to have been phased out of airline fleets in the long term future. These aircraft would be replaced by A320/ A321Neo and B737Max.
- Growth in helicopter operations were included to grow at the same rate as the overall average annual growth rates of GA fixed wing aircraft movements.
- The current mix of domestic and international destinations and stage lengths is taken as typical of the destination mix that will exist in 2042.
- The day/night split of domestic and international flights is estimated to be 81% of movements during the day (7am to 7pm) and 19% of movements at night (7pm to 7am).

Approval Process

Prior to Defence seeking endorsement by Airservices Australia of the joint civil-military ANEF, the planning authority and local government were provided with the draft 2042 ANEF and the opportunity to comment. The relevant authorities consulted were:

- Northern Territory Department of Infrastructure, Planning and Logistics
- City of Darwin
- Litchfield Council
- City of Palmerston.

The joint civil-military 2042 ANEF endorsed by Airservices Australia is at Figure 14.

For comparison purposes, the joint civil-military 2030 ANEF from the 2010 Master Plan and the endorsed 2042 joint civil-military ANEF is shown in Figure 15.

AIRCRAFT NOISE AND FLIGHT PATHS

There are some 40,000 civil jet movements forecast for 2042 compared to 23,600 per annum currently. As noted above the number of civil aircraft movements is relatively constant throughout the year, whereas military traffic is seasonal.

2042 N70 Civil Contours

The N-contour system is a complementary aircraft noise metric that shows the potential number of aircraft noise events above a certain decibel per day. It is more explanatory than the ANEF system as it shows noise in a way that a person perceives it, as a number of single aircraft movement events per day above a certain noise level. This information is portrayed as a series of 'Number Above' contours.

The Civil N70 chart (Figure 24) shows the number of civil aircraft noise events greater than 70 dB(A) that occur in a typical day. The 70 decibel (N70) measure has been the most commonly used frequency based aircraft noise measure to date because a 70 decibel outside noise will generally be experienced as a 60 decibel event inside a residence with the windows open. Sixty decibels is the sound level that will disturb a normal conversation or activities such as watching television.

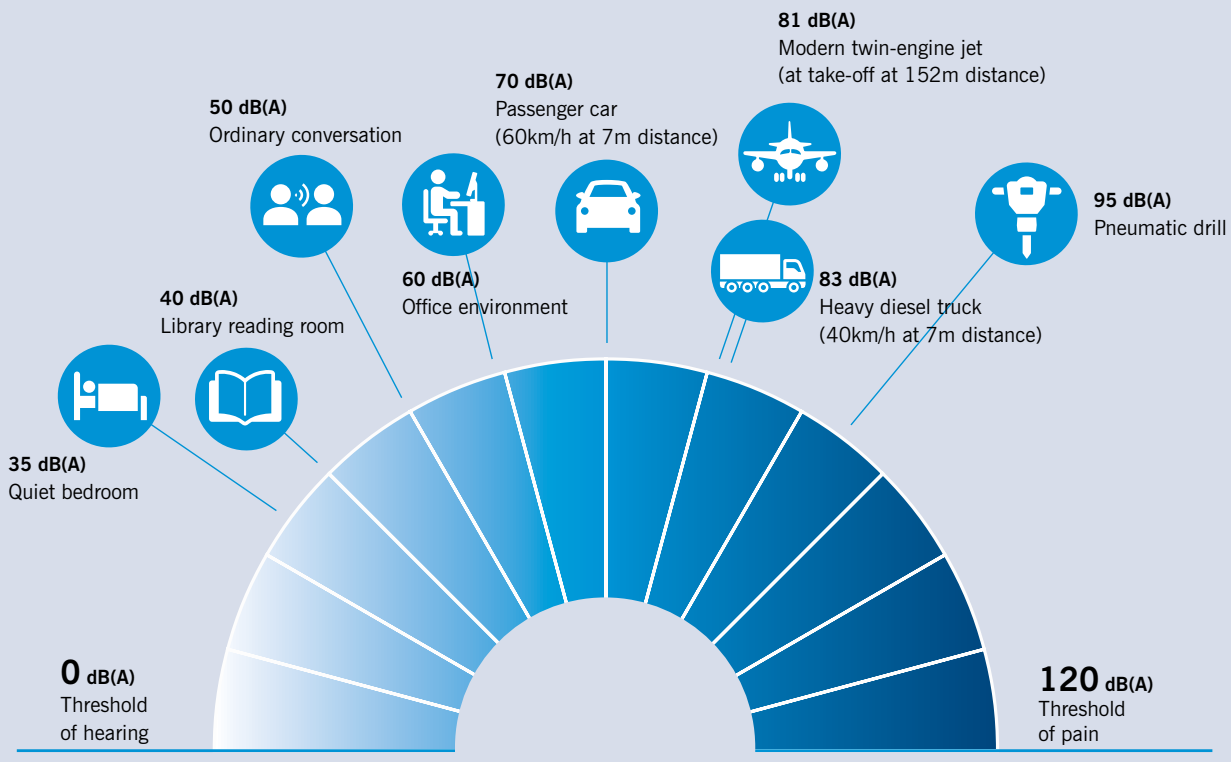
2042 N60 Night Time Civil Contour

Similarly, a 60 decibel noise outside a residence will be experienced as a 50 decibel noise level within a residence, and is likely to be more disturbing during sleeping hours. AS2021:2015 nominates the acceptable standard of noise for sleeping areas at 50 decibels, which is the level of noise that does not disturb the sleep of most people. However it depends very much on the individual. The Civil N60 night time contour delineates the area where six or more civil aircraft noise events at 60 dB(A) or greater occur between the hours of 11pm to 6am (refer Figure 26).

2042 Civil Flight Paths

Flight Paths illustrate the broad spread of flight tracks that an aircraft may fly when arriving or departing at an airport. The approved civil flight paths are at Figures 16-19. While aircraft follow flight paths these are not as precise as a train on a railway line or a car on a highway, with aircraft approaching or departing the runway within a flight path "envelope" (or "corridor"). The envelopes may vary with aircraft configuration and weather and when presented, are referred to as Swoosh Tracks. Figures 27 and 28 represent the broad civil flight tracks (swoosh tracks) and numbers of civil aircraft departures and approaches for each direction of the main runway – Runway 11/29 in 2042.

FIGURE 13: TYPICAL SOUND LEVELS



2042 N70 Joint Civil-Military Contours and Military Flight Paths

The Joint Civil-Military N70 Contours are contained in Figure 25. Approved military flight paths are at Figures 20-22. Approved military helicopter flight paths are shown at Figure 23.

MANAGING NOISE INTRUSION

Darwin International Airport Role

Australian airports have little influence in the amount of aircraft noise generated, or land use decisions around the airport and under flight paths. However, DIA will continue to work where it sensibly can to minimise noise impacts on the Darwin community.

Aircraft Ground Running

Ground running of aircraft engines is a significant part of aircraft maintenance. The majority of aircraft maintenance is conducted by General Aviation operators. DIA has established stringent operating procedures for ground running of civil aircraft, which limit this activity to specific locations and times. These locations and conditions under which ground running can occur are detailed in the Engine Ground Running Management Plan.

Noise Abatement Procedures

DIA takes a proactive approach to ensure that aircraft noise is minimised. Noise abatement procedures are published in the document Departures and Approach Procedures (Airservices Australia). Procedures have been designed for civil and military operations. These nominate Runway 11/29 as the preferred runway and note that only jet propelled aircraft that are noise certificated as per ICAO Annex 16 can operate from Runway 18/36.

Noise Monitoring

Airservices Australia has indicated that WebTrak is expected to become available for Darwin in 2017, providing aircraft flight path information over the Darwin metropolitan area. Although WebTrak also has the functionality to provide aircraft noise monitoring data, this component is not expected to be implemented.

Aircraft noise complaints received by DIA relating to aircraft flying overhead are referred to Airservices Australia, the agency responsible for managing and monitoring the impact of civilian aircraft noise. Defence manages a toll-free noise enquiry hotline for any community complaints regarding military aircraft.

Since October 2012, Airservices has published quarterly Noise Information Reports for major urban areas. These include information and analysis on aircraft movements, noise monitoring and complaint issues.

FIGURE 14: ENDORSED 2042 JOINT CIVIL-MILITARY ANEF

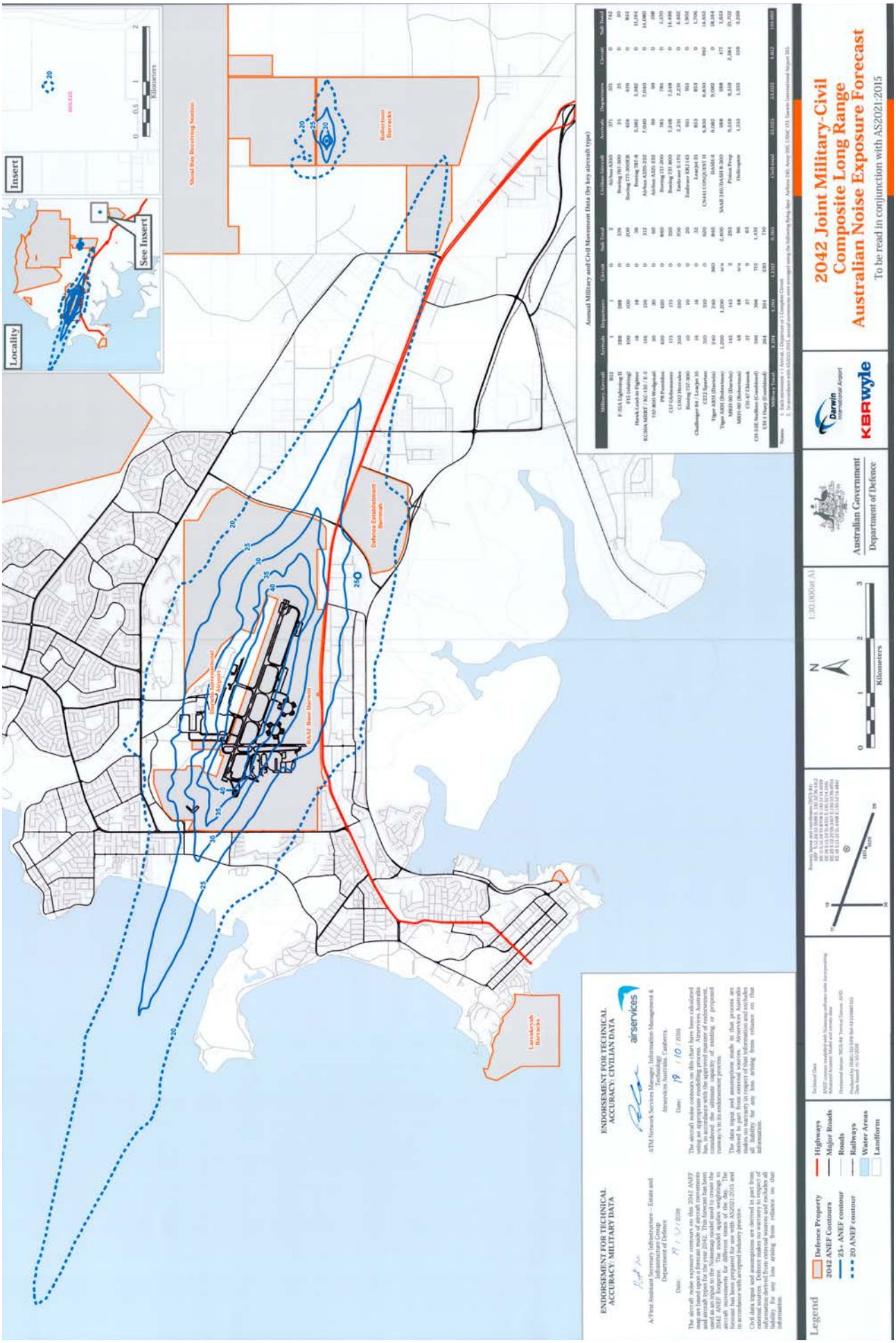


FIGURE 15: 2030 ANEF AND 2042 ANEF COMPARISON

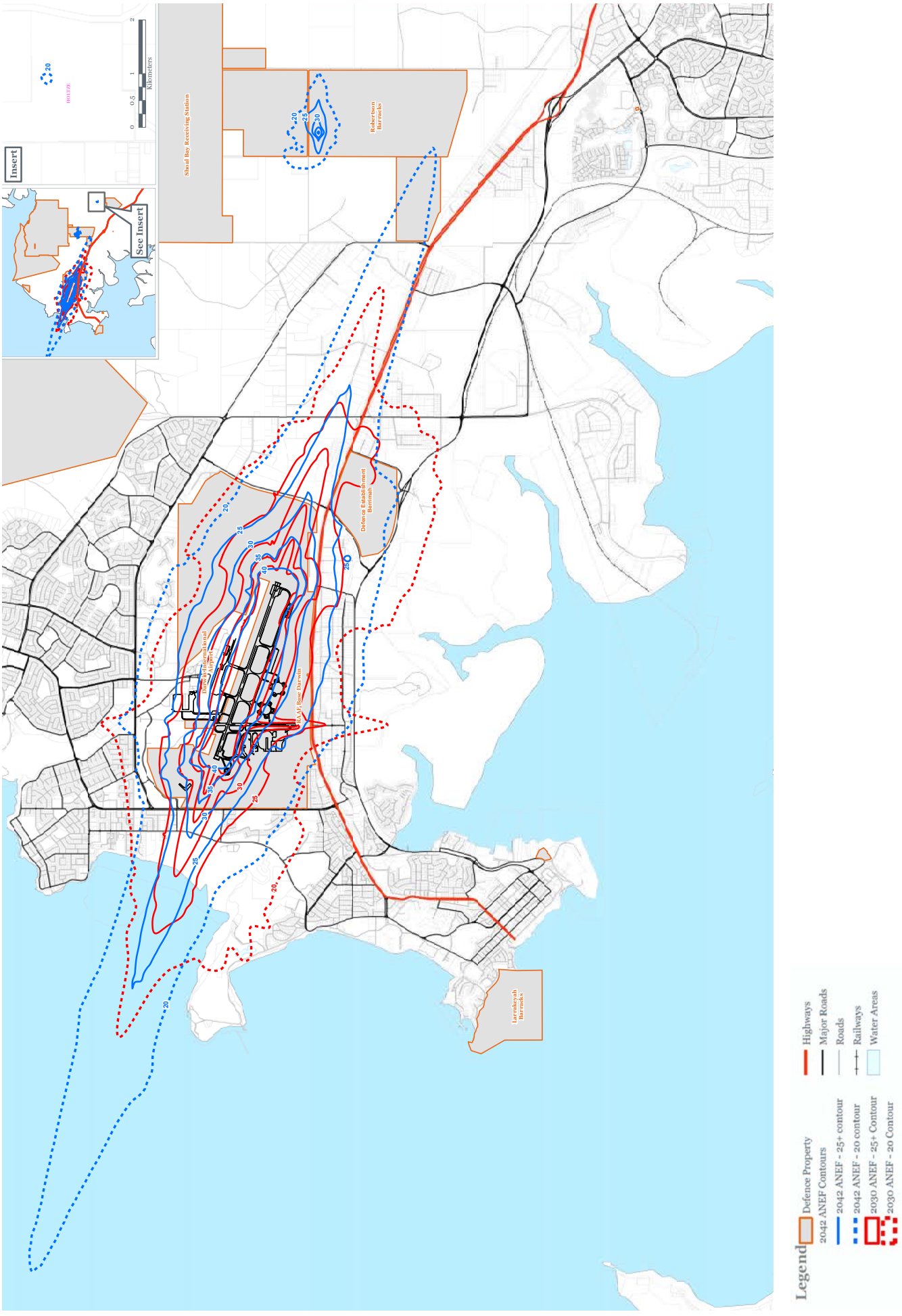


FIGURE 16: 2042 CIVIL FLIGHT PATHS – ARRIVALS

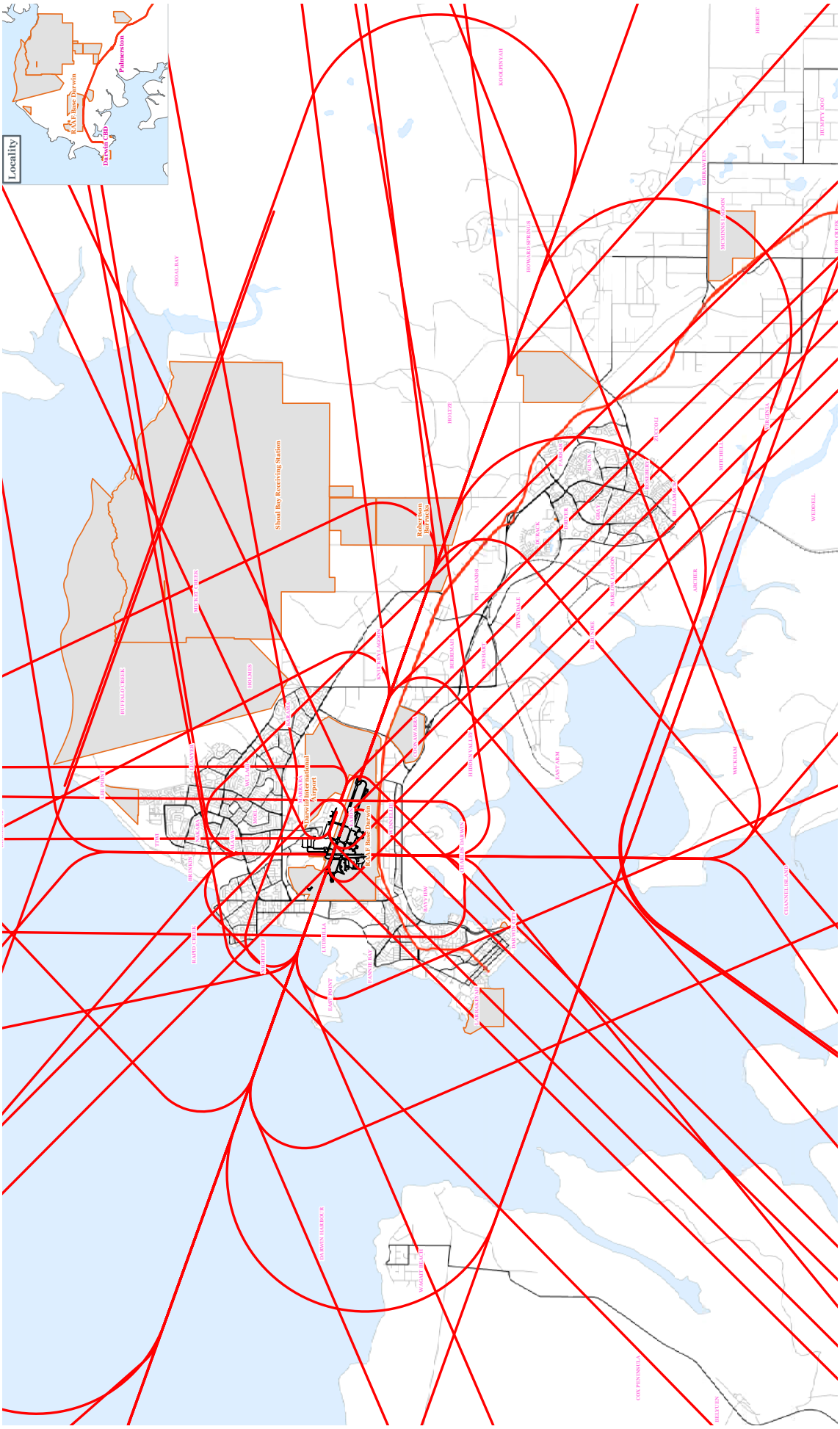


FIGURE 17: 2042 CIVIL FLIGHT PATHS – DEPARTURES

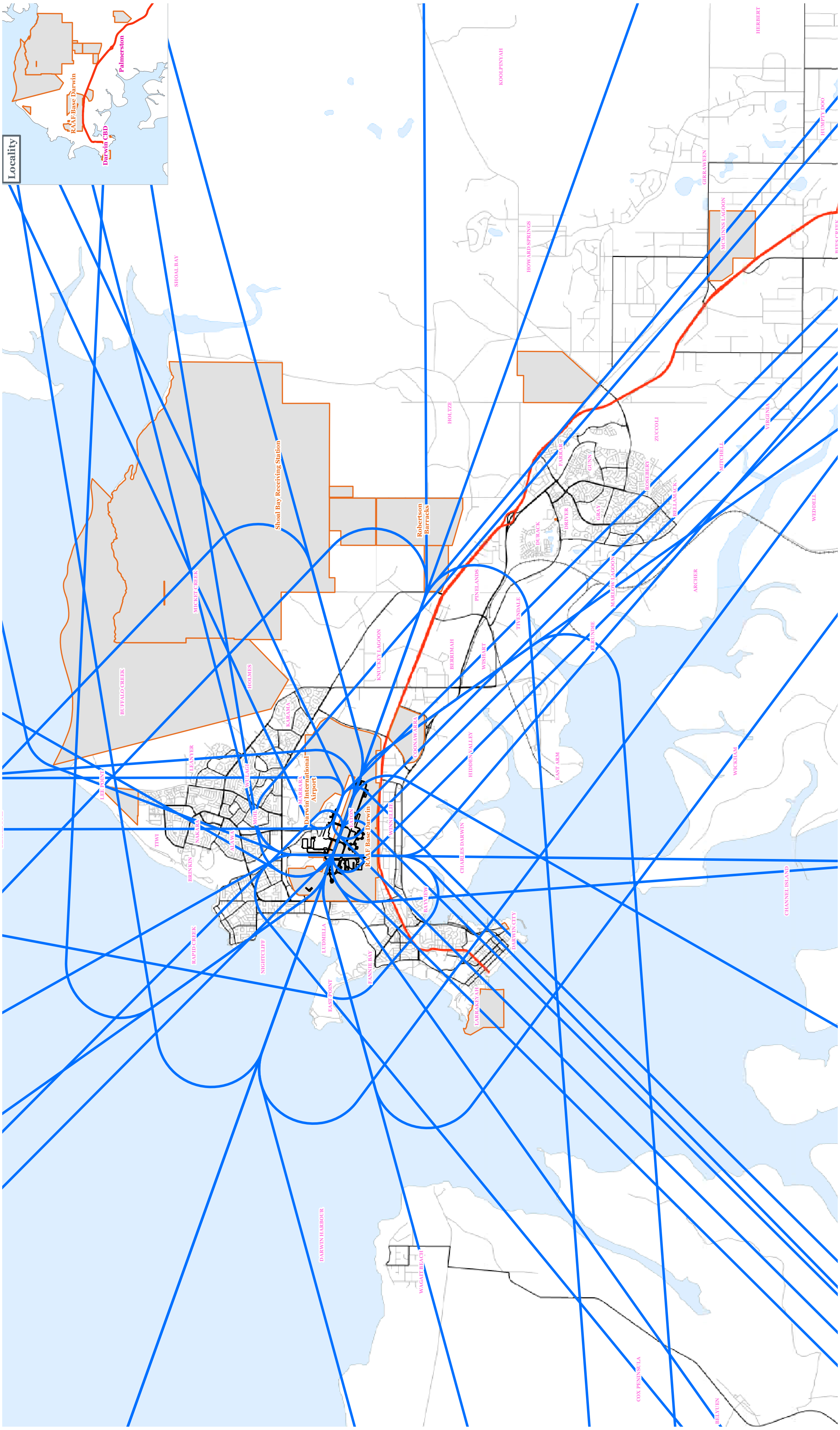


FIGURE 18: 2042 CIVIL FLIGHT PATHS – CIRCUITS

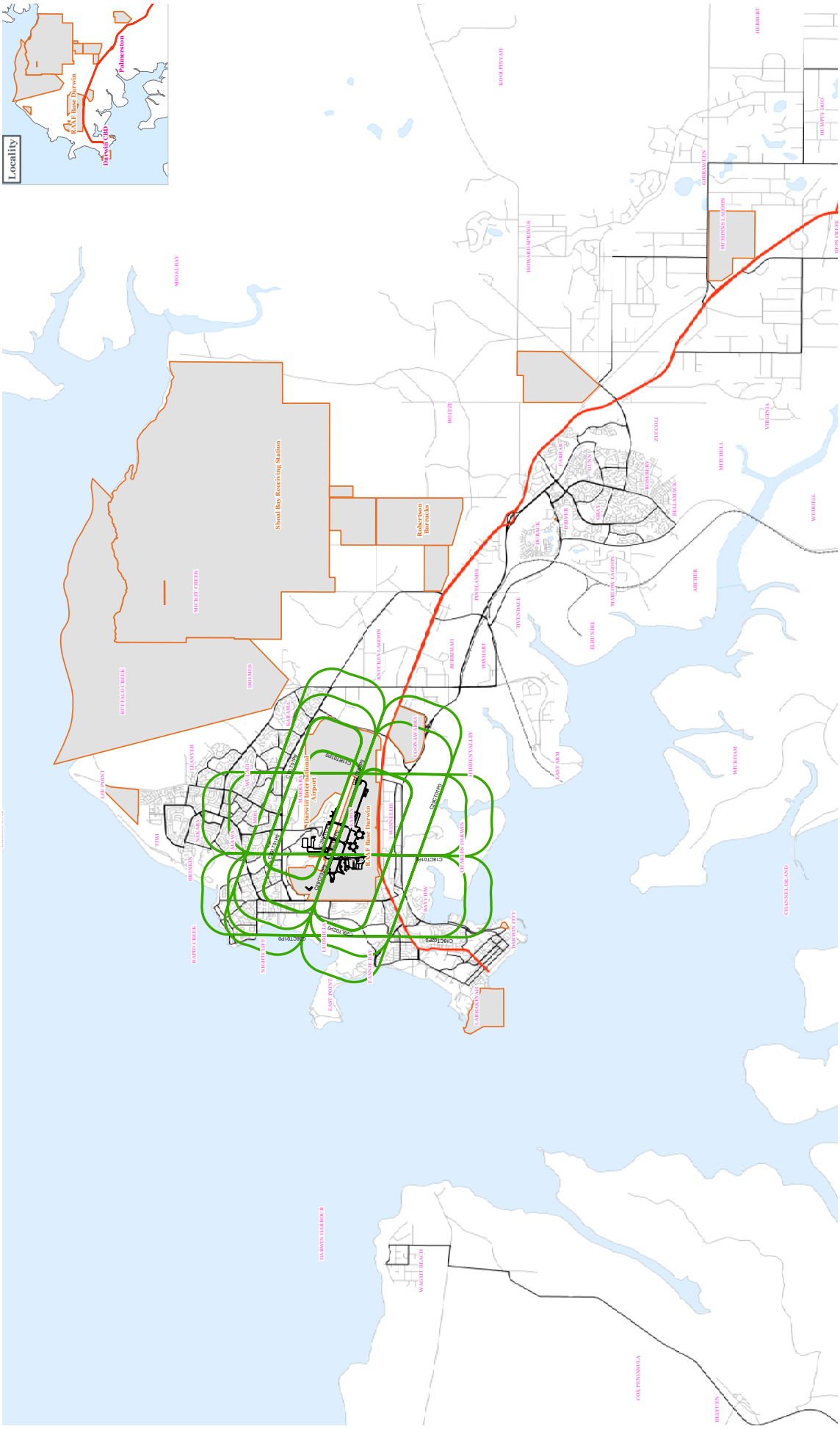


FIGURE 19: 2042 CIVIL FLIGHT PATHS – HELICOPTERS

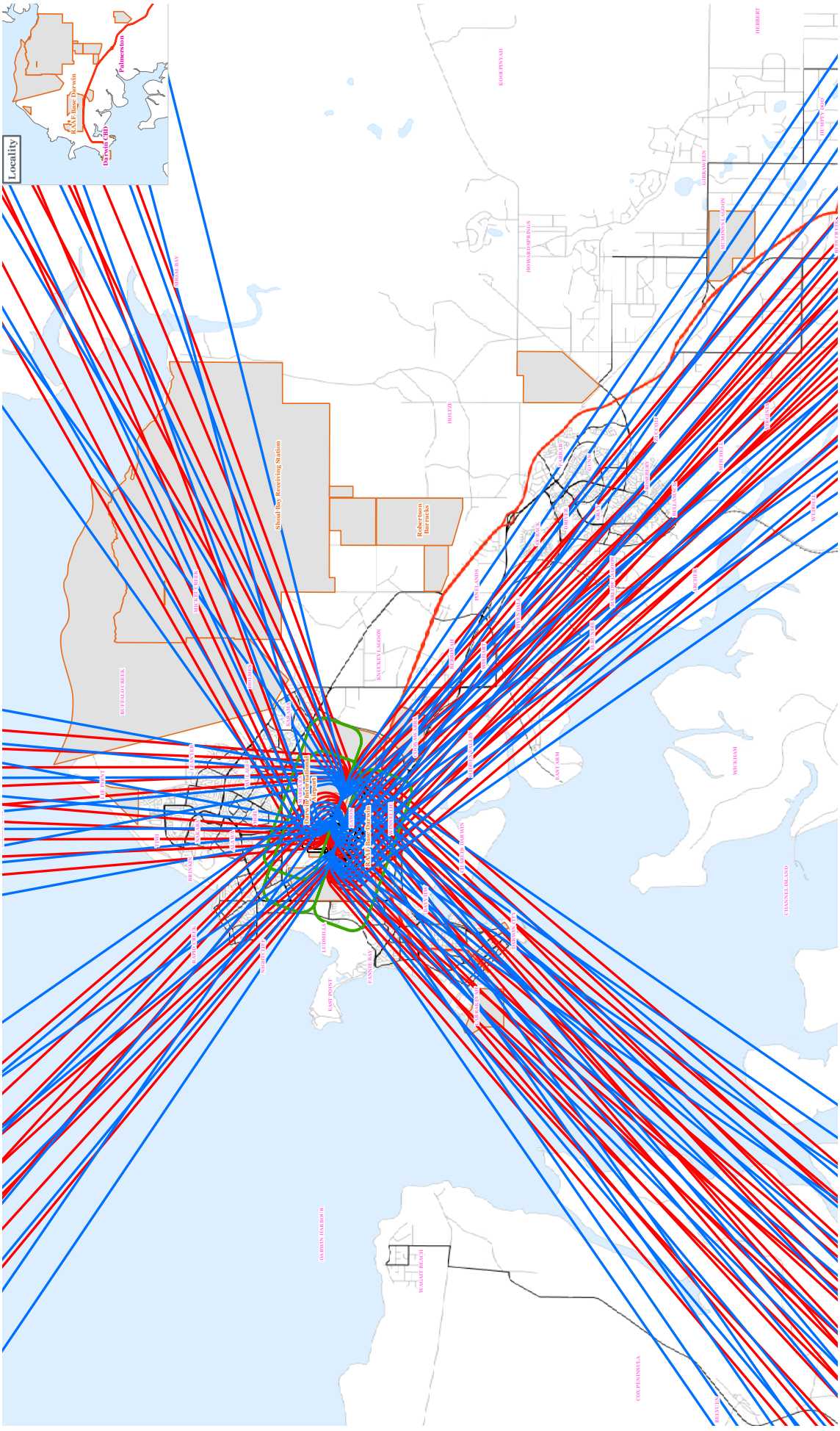


FIGURE 20: 2042 MILITARY FLIGHT PATHS – ARRIVALS

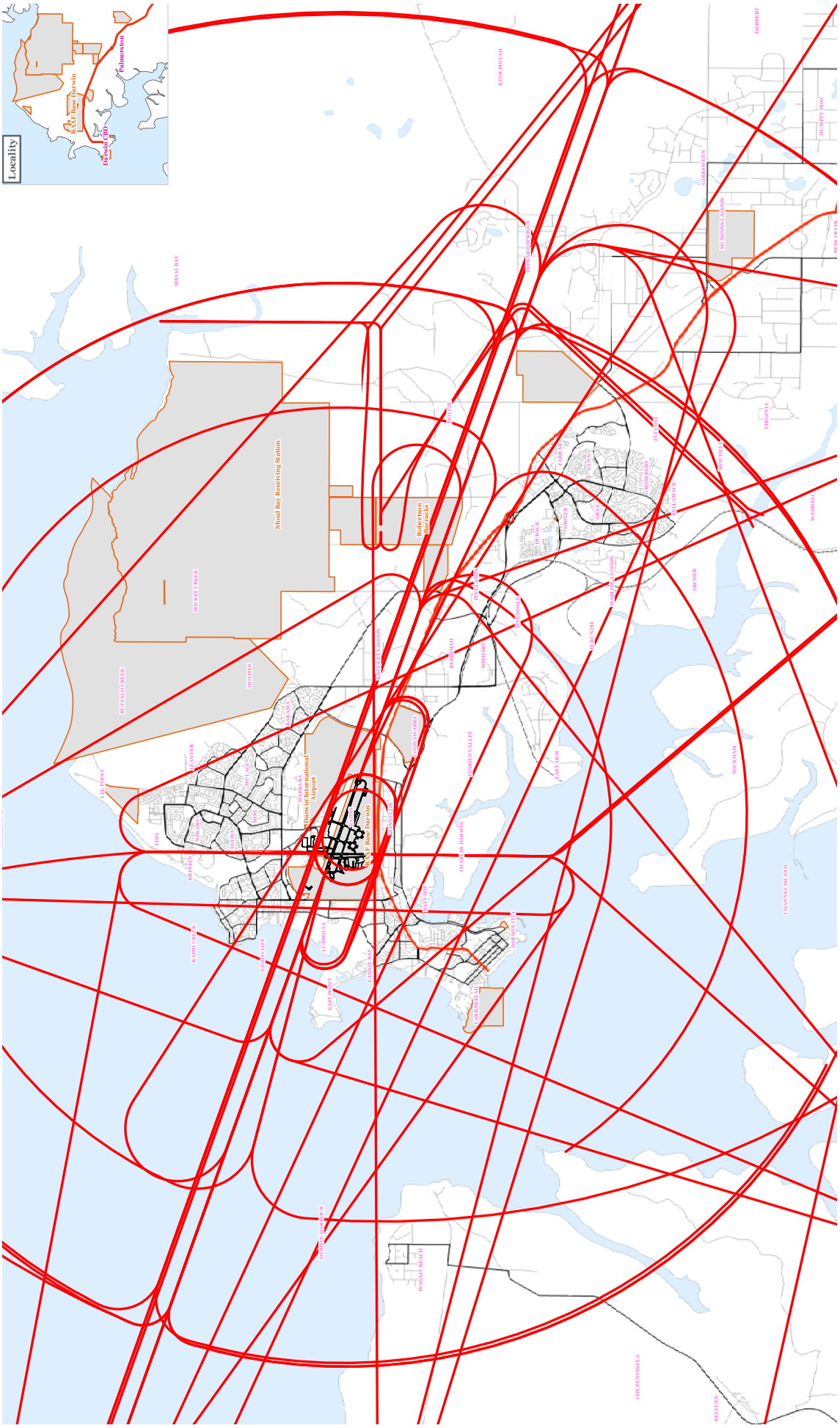


FIGURE 21: 2042 MILITARY FLIGHT PATHS – DEPARTURES

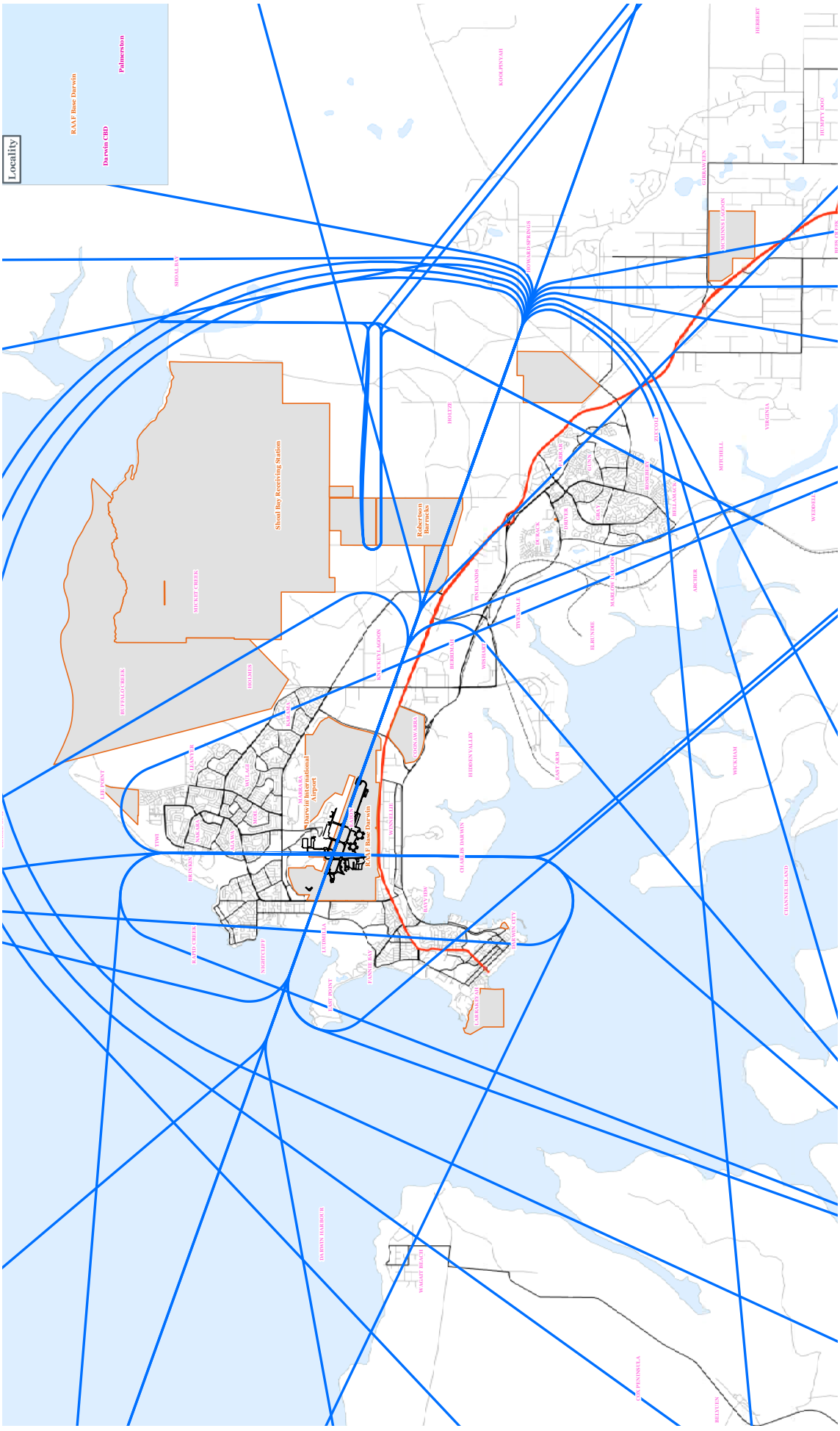


FIGURE 22: 2042 MILITARY FLIGHT PATHS – CIRCUITS

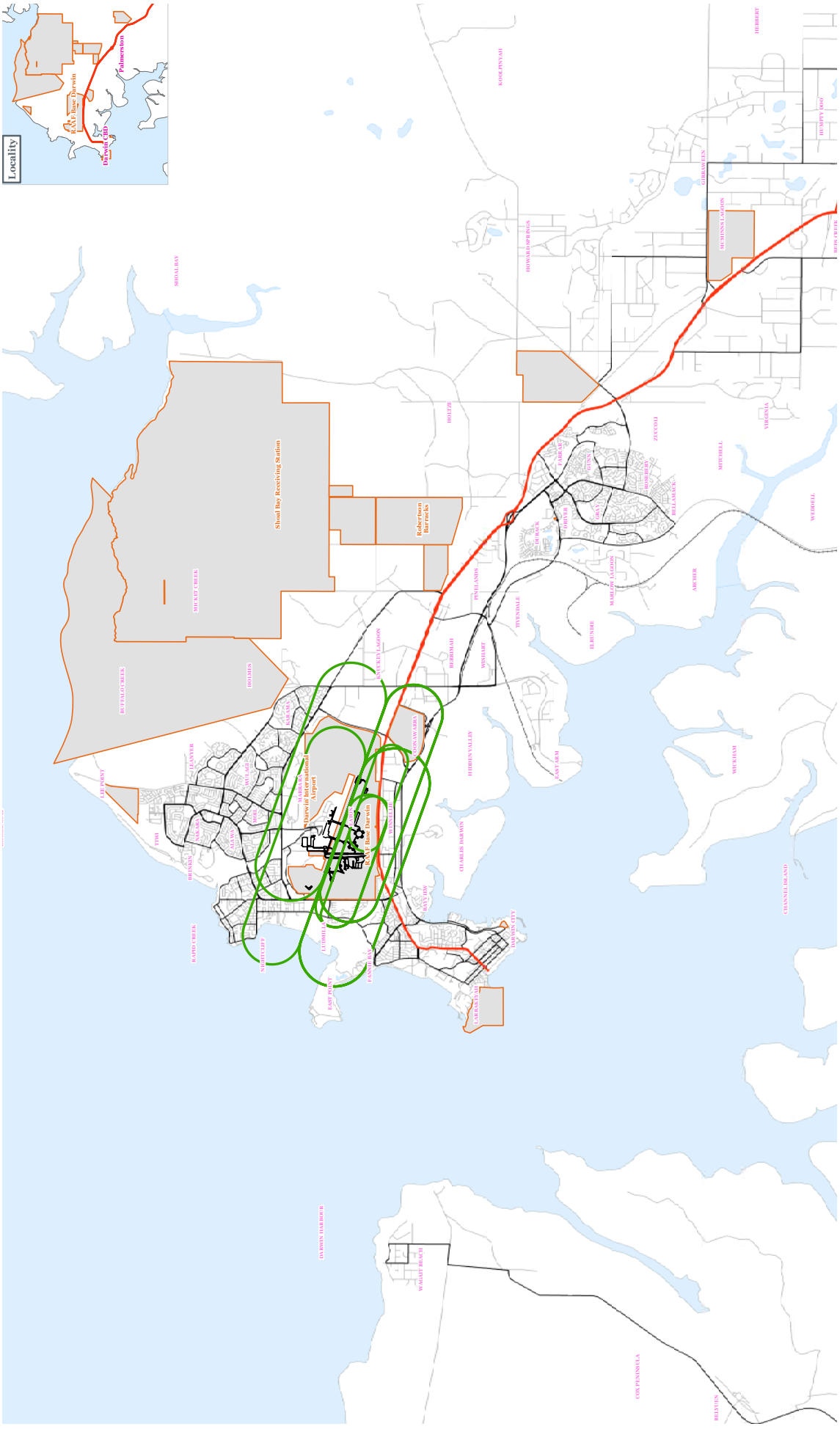


FIGURE 23: 2042 MILITARY FLIGHT PATHS - HELICOPTERS

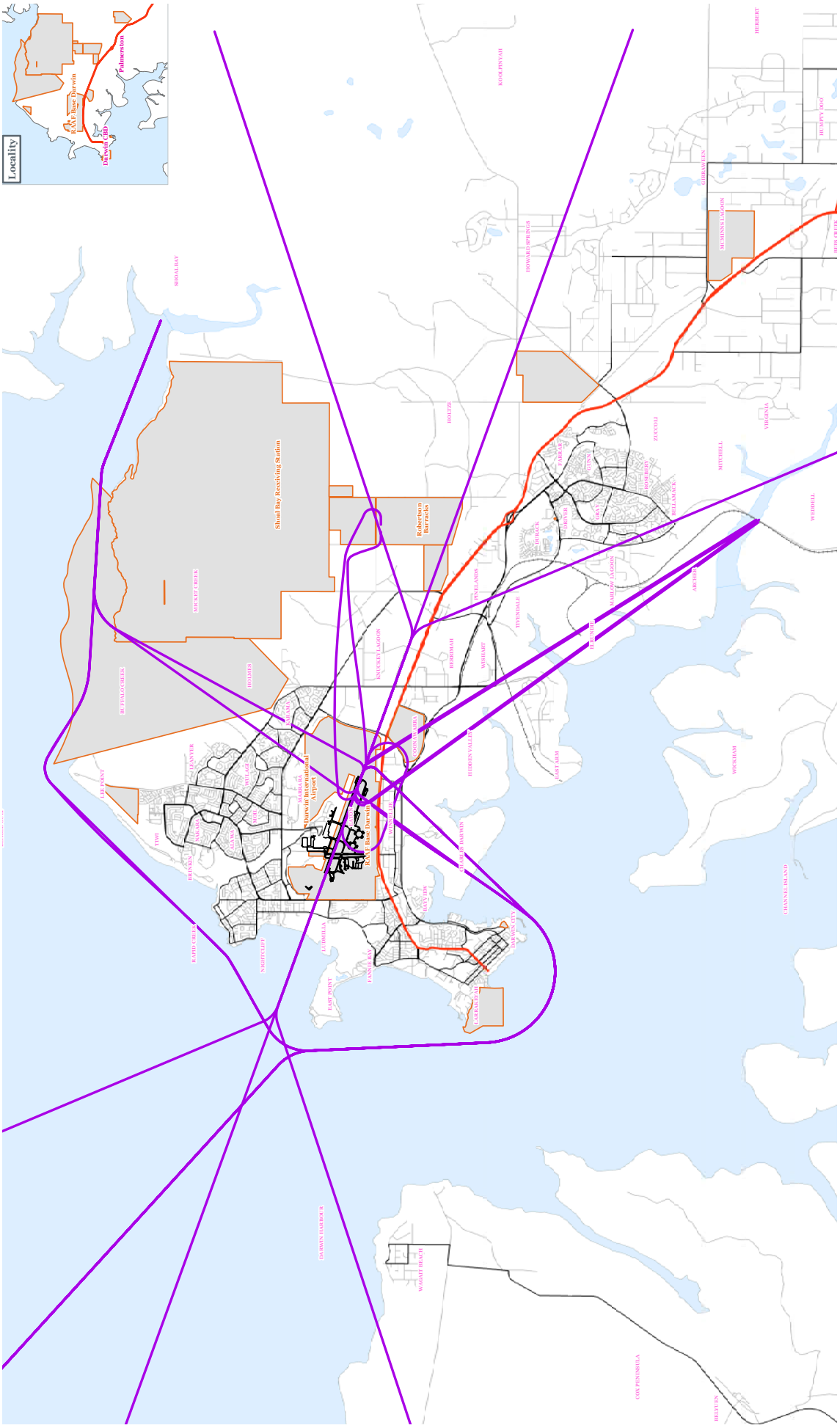


FIGURE 24: 2042 CIVIL N70

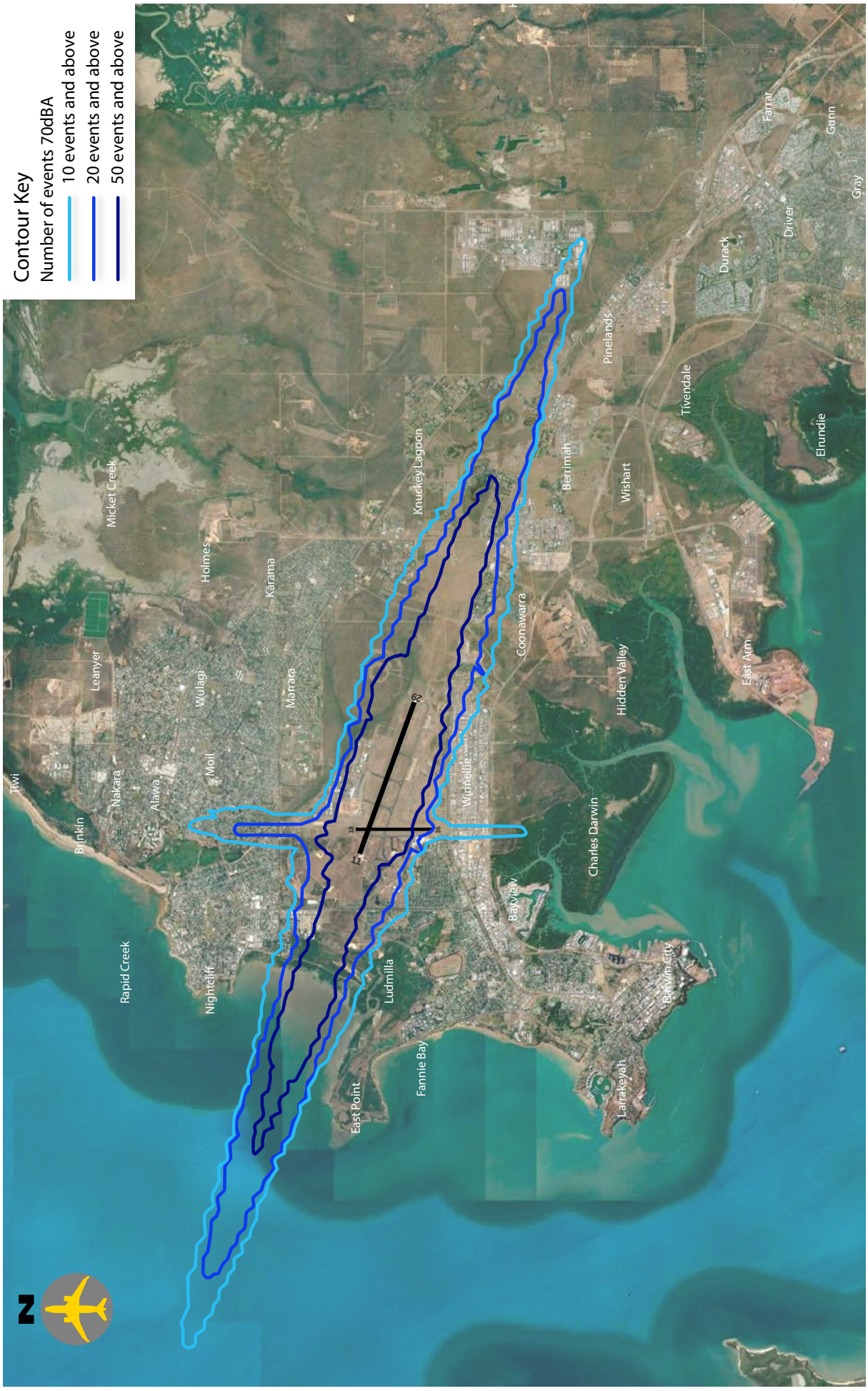


FIGURE 25: 2042 JOINT CIVIL-MILITARY N70

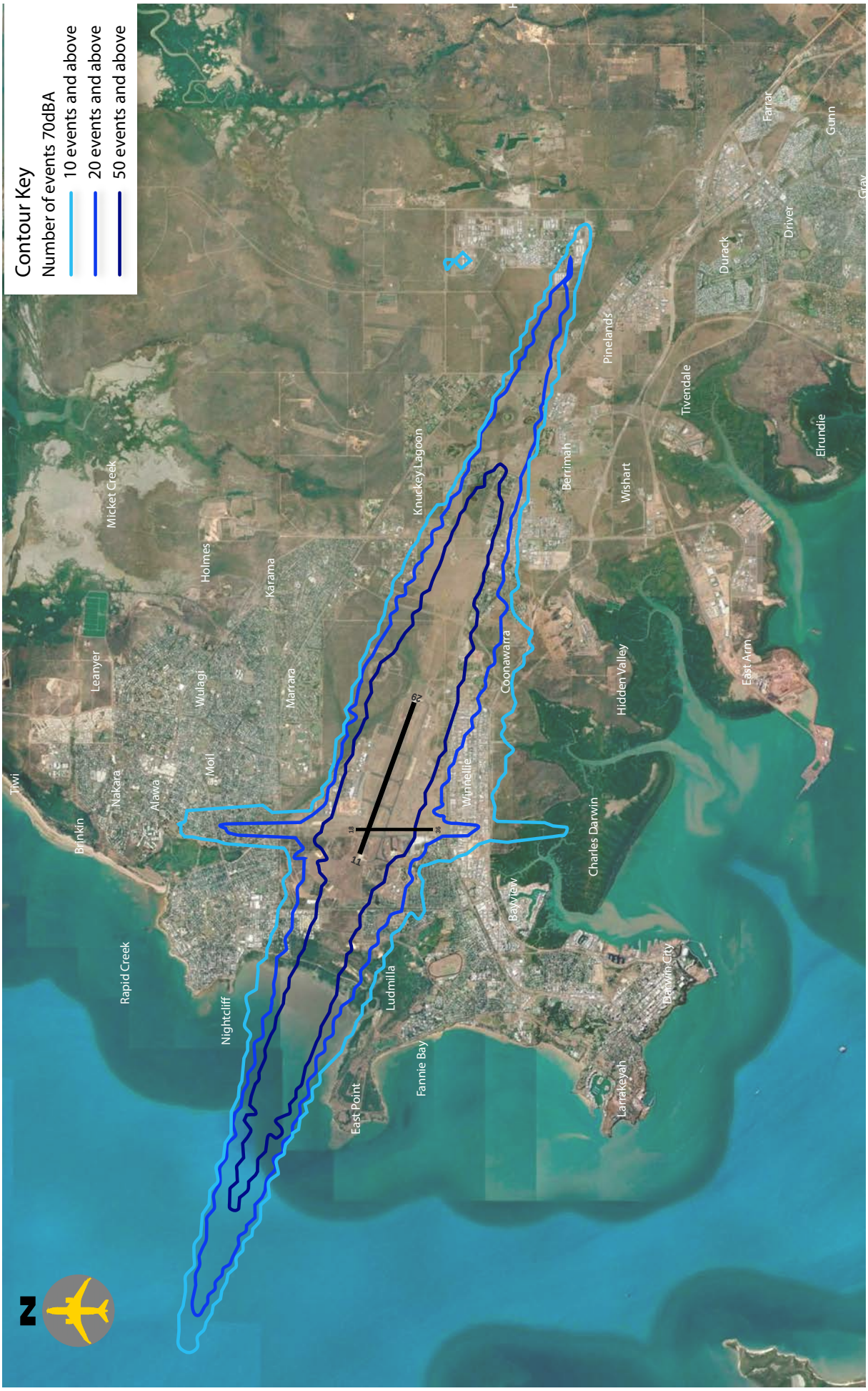


FIGURE 26: 2042 CIVIL NIGHT N60

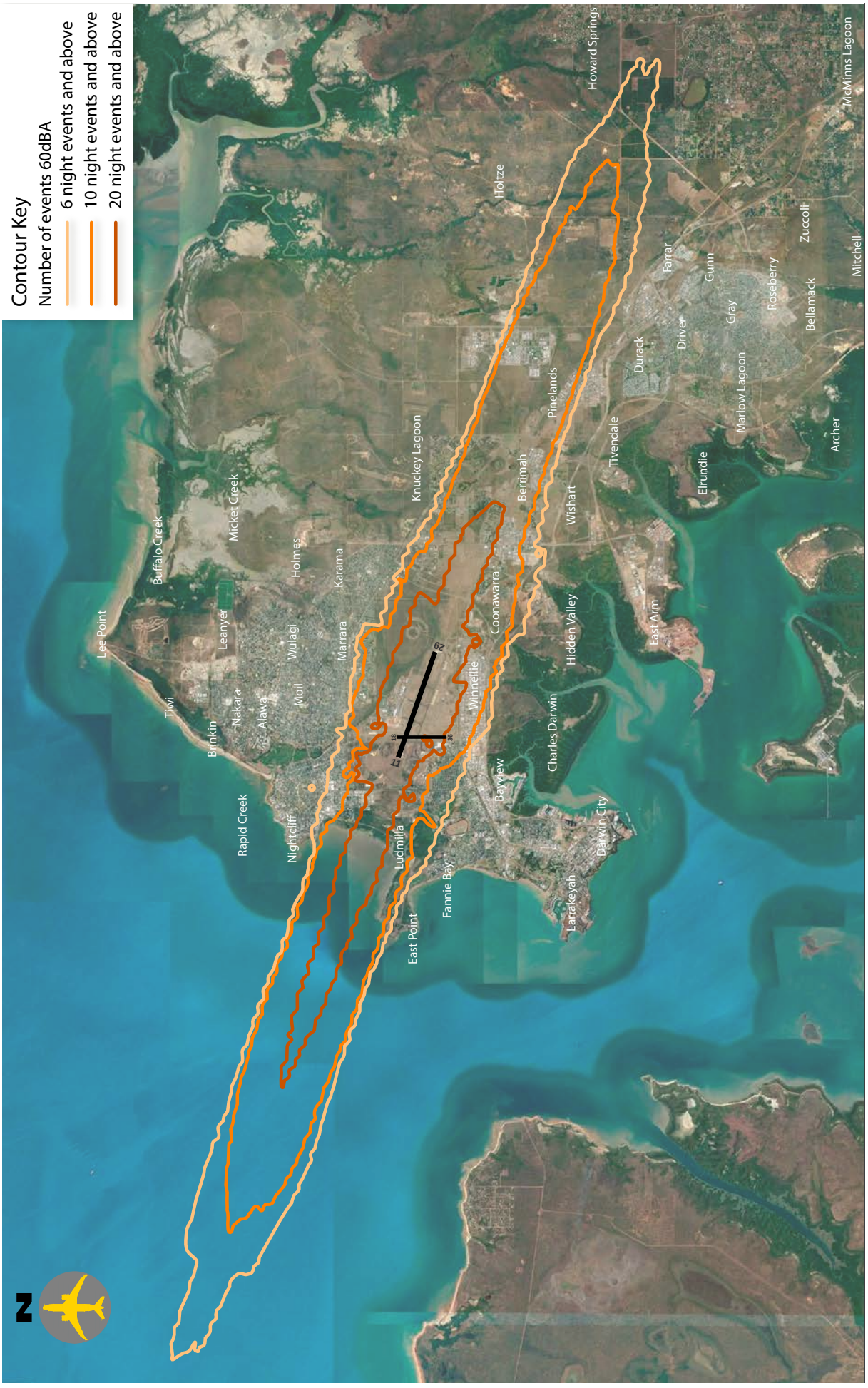


FIGURE 27: 2042 RUNWAY 11 CIVIL SWOOSH TRACKS AND AIRCRAFT DEPARTURES/ARRIVALS

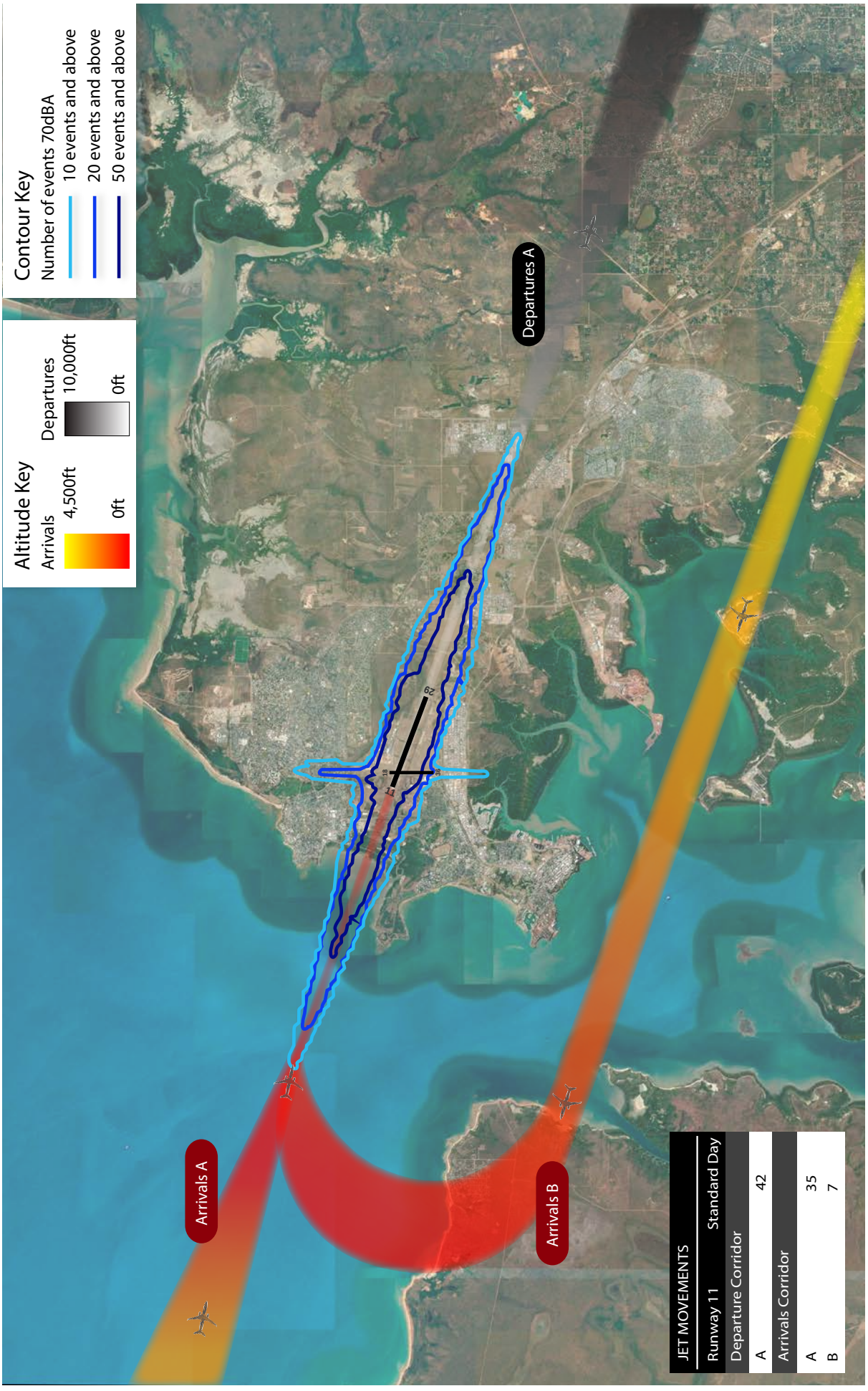
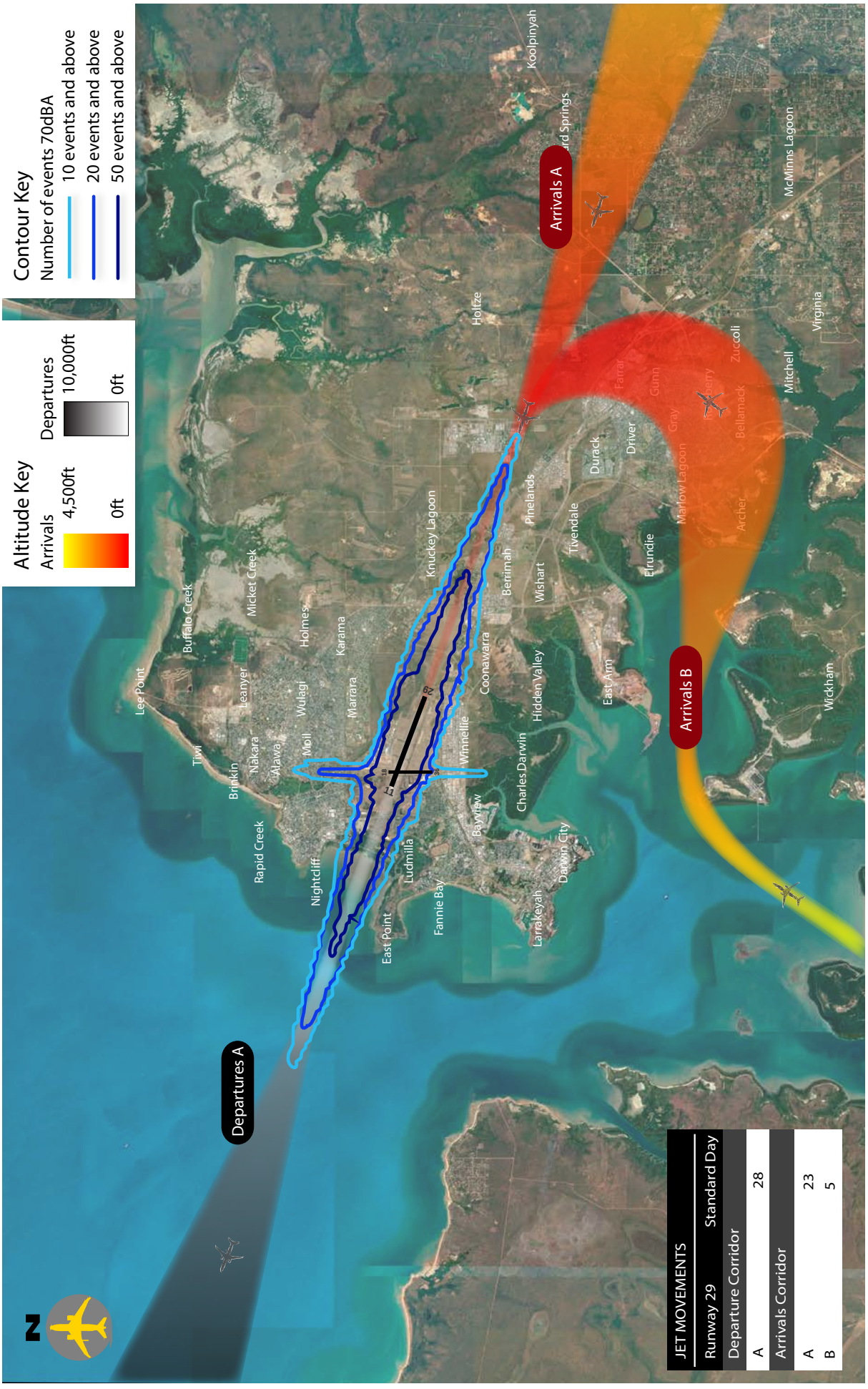


FIGURE 28: 2042 RUNWAY 29 CIVIL SWOOSH TRACKS AND AIRCRAFT DEPARTURES/ARRIVAL



SECTION 12

Terminal Development Concept

12

- Darwin International Airport aims to provide passengers with a safe, secure and efficient terminal which meets the needs of our airline partners.
- DIA has recently completed a major terminal expansion, increasing in size from 16,000m^2 to 27,000m^2.
- Future expansions of the terminal building will be in line with passenger growth, and will continue with an integrated domestic / international facility.


1
15:52
Oversized Baggage
2

SECTION 12

Terminal Development Concept

The Darwin International Airport (DIA) passenger terminal provides a lasting impression for passengers and visitors to the airport. The terminal is the front door to the airport business and serves as the public interface between landside and airside activities. DIA aims to provide passengers with a safe, secure and efficient terminal which meets capacity and flexibility requirements of our airline partners, while delivering a unique Top End experience to the travelling public.

There are currently four daily peak periods of operations at the airport; 3 to 4 hourly peak periods are spread around midday, midnight, early morning and late afternoon. Due to Darwin's geographic location and average sector lengths (4 hours) from international and domestic cities, these peak times of operation are unlikely to change in the foreseeable future. These peaks influence the design of the terminal.

PLANNING PRINCIPLES

The International Air Transport Association (IATA) Guidelines for airport capacity management provides a level of service framework that permits comparison between subsystems within the airport environment. The framework ranges from levels of service Category A, which provides an excellent level of comfort, to Category F, which provides unacceptable levels of service, delays and an unacceptable level of comfort.

Future terminal and passenger facility planning for DIA has been based on IATA level of service Category C, which provides good levels of service and comfort at a reasonable cost. This is in line with maintaining flexibility to support both Full Service Carriers (FSC) and Low Cost Carriers (LCC) simultaneously.

Disability Access

Developments at DIA comply with the obligations of the *Disability Discrimination Act 1992*, the *Disability (Access to Premises – Buildings) Standards 2010*, and the *Disability Standards for Accessible Public Transport 2002* (Transport Standards).

DIA has developed and published a Disability Access Facilitation Plan for the airport, which is available on the DIA website. This plan provides detailed information on the availability and access of services at DIA for passengers with disability.

CURRENT TERMINAL FACILITIES

DIA operates a single terminal that handles both domestic and international passenger movements.

The terminal building has recently undergone a major $75 million expansion, with works completed in 2015. The terminal has been extended at its eastern and western ends, as well as many areas of the original terminal building refurbished. The terminal expansion represents much more than bricks and mortar. It delivers essential infrastructure, paves the way for trade and tourism growth, and provides capacity to bring more people and investment into Darwin.

Highlights of the recent terminal expansion include:

- **Increased capacity:** The terminal has almost doubled in size, growing from 16,000m^2 to 27,000m^2.
- **Upgraded customer service points and facilities:**
  - expanded arrivals and departures areas
  - a larger check-in area
  - four new domestic and two new international boarding gates, with the terminal now equipped with a total of 13 boarding gates
  - an additional security screening area
  - a new multi-use baggage reclaim area for both domestic and international arrivals
  - improved inbound and outbound border agency processing areas.
- **New domestic airline lounges:** Long-term commitments from Qantas and Virgin Australia, with both carriers investing in new domestic passenger lounges
- **New premium international lounge:** In August 2016, DIA opened the Catalina Lounge, the first airport developed and operated international lounge in Australia
- **Improved retail offerings:** New and redesigned retail outlets have greatly improved choice for travellers.
- **New aerobridge:** Construction of a new aerobridge, increasing the number of aerobridges servicing the terminal to five.

- **New wayfinding signage:** Complete redesign of wayfinding signage throughout the expanded terminal environment.
- **Sense of Place:** New artworks welcome passengers and are showcased throughout the terminal, capturing elements of the Top End character.

FUTURE DEMAND

The projected annual passenger demand in 2037 for the terminal is close to 6 million passengers. Annual passenger demands do not provide a true representation of the impact on terminal capacity. Therefore busy hour passenger forecasts are used to determine development requirements.

2037 DEVELOPMENT CONCEPT

Terminal growth beyond 2017 will be accommodated by expanding the existing terminal within the Terminal and Facilities Zone. The timing of future expansion will be determined by peak hour demand.

In line with DIA's development objectives outlined in Section 5, future developments to the terminal will seek to improve operational efficiency and enhance the customer experience of our passengers.

As with the 2010 Master Plan, it is envisaged that DIA will continue to operate a single terminal that handles both domestic and international passenger movements. Future expansion to the terminal will be predominantly to the west, with the building footprint wrapping around to the northwest (see Figure 29). There is opportunity for some additional expansion to the east, as needed. A terminal pier will be developed if required, positioned to the west. The provision of additional aerobridges to connect the terminal to active (contact) aircraft stands will be considered as both the airfield and terminal building continue to develop and grow, and will be assessed on an as-needs basis.

Key areas that will drive the future expansion of the terminal will be baggage make-up, baggage claim, and to some extent the domestic departure lounge and retail requirements.

Further extension of the passenger terminal within the Terminal and Facilities Zone may include, but not be limited to:

- Construction of new domestic processing areas, including check-in, departure lounges and associated retail offerings
- Enhanced baggage facilities including inbound baggage claim areas
- Expanded baggage make-up facilities
- Enhanced depth of the terminal to approximately 80m
- Increased international arrivals and international departures processing areas.

The planning and delivery of any future terminal developments will be undertaken in close consultation with airport stakeholders.

CUSTOMER EXPERIENCE

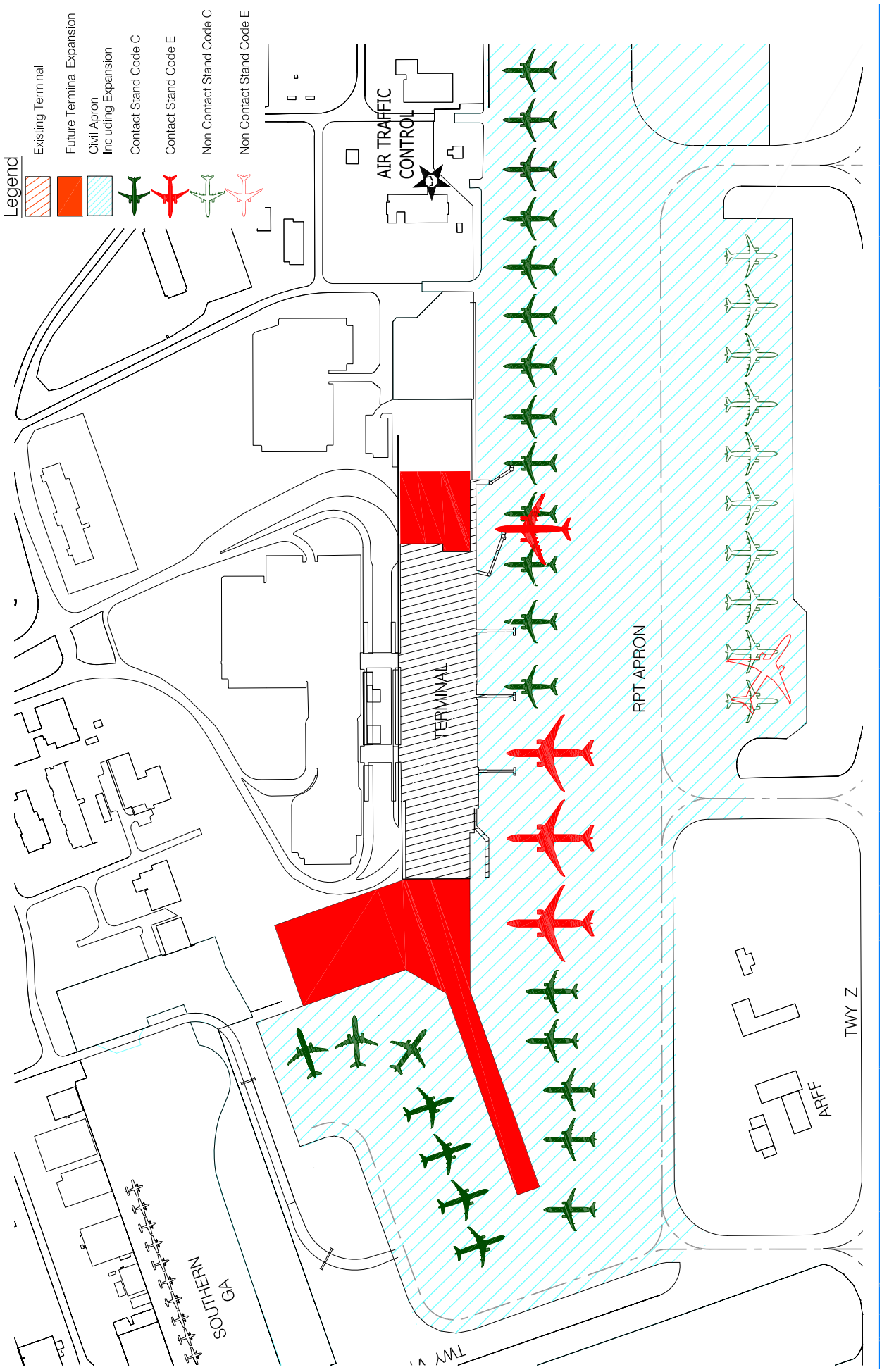
The experience of customers visiting the airport is paramount to DIA, with DIA committed to improving customer experience both within the terminal environment and the broader airport precinct.

In April 2016, DIA introduced *Welcome to Our Place*, an innovative new approach to enhance customer experience at the airport. It is a customer experience promise by DIA to ensure the comfort and satisfaction of all visitors to the airport. It has been strategically driven in collaboration with airport stakeholders, and encourages all members of the airport community to treat customers with respect, warmth and friendliness.

Welcome to Our Place is tailored to sit within all aspects of the business to ensure whole of airport input. When rolling out this initative DIA considered the people, ambience, infrastructure and processes, and how each of these can affect the customer experience.

In addition to this, DIA participates in the Airports Council International's Airports Service Quality (ASQ) Monitoring Program. ASQ is a global benchmarking programme measuring passengers' satisfaction whilst they are travelling through an airport. Results are gathered on a quarterly basis, and provide DIA and airport stakeholders with a greater understanding of our customers' needs and therefore the ability to deliver a better customer experience.

FIGURE 29: 2037 TERMINAL DEVELOPMENT CONCEPT



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SECTION 13

Aviation Support Facilities and Utilities

13

- Fuel supply is critical to airline operations and land for expansion of the existing fuel storage facility has been identified.
- Expansion of aircraft maintenance, freight handling, ground service equipment, flight catering and utilities capacity is provided for.

SECTION 13

Aviation Support Facilities and Utilities

There are a range of aviation support activities at Darwin International Airport (DIA) that support the core aviation business of transporting passengers and freight.

Facilities to support these activities include supply, storage and distribution of fuel, aircraft maintenance, ground support equipment storage and flight catering. Support utilities include water supply, sewage, stormwater drainage, electricity supply and communications.

DIA is responsible for internal electricity, water, sewage and stormwater infrastructure.

AVIATION FUEL

The safe and continuous supply of fuel is critical to on-time performance of all aircraft operators at the airport. Any disruptions to the supply of fuel will impact aircraft movements and passengers.

Existing Facilities

There is no fuel pipeline delivery to DIA. Fuel is supplied to the airport by road tanker to a storage facility consisting of five underground fuel tanks, totalling 1 million litres. At maximum capacity this can serve the airport needs for around 1-2 days depending on aircraft movements. On average, 400,000 litres of Jet A1 fuel is delivered each day by double road trains to Joint Aviation Fuel Services (JAFS) located on Lancaster Road. The Jet A1 fuel is dispensed via an in-ground hydrant system currently servicing 13 aircraft parking positions on the RPT Apron.

General Aviation aircraft are serviced from a fuel facility located in the Northern GA area. Fuel is stored in two underground fuel tanks, totalling 145,000 litres. Airport fuel tankers carrying up to 16,000 litres deliver this fuel to aircraft in all parts of the airport.

2037 Development Concept

The forecast increase in aircraft movements will result in increased fuel consumption over time. This will necessitate expanded fuel facilities in the short term. Adjacent land has been reserved in the Aviation Activities Zone for this purpose as indicated in Figure 30.

In conjunction with the Northern Territory Government and the Department of Defence, a dedicated fuel pipeline from East Arm to the airport may be constructed.

The existing hydrant system to the RPT apron will be extended as required.

AIRCRAFT MAINTENANCE

There are three main types of aircraft maintenance activities:

1. Line maintenance – this occurs during transit and turnaround and can be performed at the aircraft parking position.
2. Base Maintenance – this requires ground-time in a hangar with simple access docking, or at a parking position away from the terminal. Ground time periods can range between 20 and 36 hours.
3. Heavy maintenance – this requires significant ground-time in a hangar with extensive docking capabilities. Ground-time periods can range between 6 to 50 days depending on the type of heavy maintenance being performed.

In addition to hangars, there is a need for support functions such as workshops, component stores and engine run facilities.

Existing Facilities

There is extensive General Aviation maintenance activity covering line, base and heavy maintenance throughout the GA areas. Currently airlines conduct line maintenance on the RPT Apron. Airnorth conducts base and heavy maintenance activity in their facilities.

2037 Development Concept

Provision is made for expanded airline maintenance facilities within the Aviation Activities Zone in the Eastern Aviation area.

General Aviation aircraft maintenance capacity will expand in line with General Aviation activity.

GROUND SERVICE EQUIPMENT

Ground Service Equipment (GSE) includes a range of vehicle and equipment used to service aircraft between flights. GSE is used to perform a variety of functions, including starting aircraft, aircraft maintenance, aircraft refuelling, transporting freight to and from the aircraft, loading freight, transporting passengers to and from the aircraft, baggage handling, aircraft waste disposal services and food services. Provision of adequate areas adjacent to the apron for storage of GSE is necessary for efficient operations.

Existing facilities

The existing GSE storage areas lie to the east and west of the existing terminal area, and comprises an area of approximately 10,500m^2. There are additional GSE parking areas on the RPT aircraft bays.

2037 Development Concept

The area required for GSE storage is dependent on a number of key factors including peak demand, aircraft configuration, number of ground handling agents and types of equipment. GSE areas will expand in line with demand.

FLIGHT CATERING

Uplift catering for RPT aircraft is prepared on and off airport.

Existing facilities

Currently there are both on airport and off airport flight catering facilities in operation. Unlike many aviation-related activities, there is no specific need for flight catering facilities to be located on airport.

2037 Development Concept

Provision is made for flight catering to continue on airport if required.

UTILITIES

To ensure that DIA operates effectively into the future, appropriate infrastructure and utility services must be able to meet future demands placed on them.

Water Supply

Existing Services

Potable water for the airport is taken from two external mains connections: one adjacent to McMillans Road (south of the intersection with Charles Eaton Drive) and the other at Bagot Road near Bunnings.

The terminal precinct water is transferred into a holding tank which then feeds a pressure pump set. Both domestic water and fire hydrant water share the same ring main system. The pressure pump set is sized to provide sufficient firefighting water without external intervention.

The remainder of the airport's lease area is supplied at Power and Water Corporation (PWC) mains pressure.

Future Extensions

The domestic and fire water systems will be augmented as required for future developments.

Sewerage

Existing Services

The current built area has a reticulated gravity system which feeds the various pumping stations that discharge to the main sewerage pumping station to the north of the General Aviation area. This in turn pumps via a rising main to the PWC Marrara Trunk Sewer on the north-east side of Rapid Creek.

The receiving capacity of PWC infrastructure is at its limit.

Future Extensions

Until PWC sewage receival capacity is increased, DIA will augment its internal sewage holding capacity in order to smooth the discharge rate to the PWC system.

Additional pumping stations may be required to meet demand resulting from staged development over the planning period. New gravity sewer mains falling towards the Murphy Road pumping station will need to be constructed to cater for future growth.

Stormwater Drainage

Existing Services

Stormwater drainage utilises both open drains and stormwater pipes which lead into Rapid Creek and Ludmilla Creek. DIA has established extensive monitoring and implemented a variety of controls to minimise the impact of airport stormwater.

A large retention basin was established in the north-western corner of the airport site in 2007 in conjunction with Department of Defence to retard water flows from airside land into the Ludmilla catchment and drainage systems.

Independent hydraulic modelling indicates that measures DIA can take on its land to mitigate flows into Rapid Creek have a minor impact on the peak flow at the gauging station near Kimmorley Bridge. The peak flow at this gauging station is the critical indicator of impact on flood-affected residents in a Q100 flood. A Q100 flood is a flood that has only a 1% chance of being equalled or exceeded in any one year. Based on Darwin's climatic conditions, a year in this case is best thought of as the middle of a dry season to the middle of the next dry season, and not as a calendar year.

DIA strongly supports construction of a large retention structure on the triangle block (bounded by McMillans Road, Henry Wrigley Drive and Rapid Creek) as the most effective measure in reducing future flooding of residences adjacent to Rapid Creek. This will take the peak flow condition of Rapid Creek for ultimate development of DIA to well below the calculated Q100 flood in 1998 (before airport privatisation).

DIA has committed to undertake a number of flood mitigation measures within the DIA lease area to assist in reducing flooding in Darwin's Northern Suburbs from Rapid Creek. In addition to this, DIA is currently developing stormwater control guidelines to mitigate the peak flow of stormwater from new on airport developments into Rapid Creek.

Future Extensions
Additional stormwater capacity will be constructed as required by future development.

Electricity Supply

Existing Services
The airport is currently served by three feeds from PWC, any two of which are sufficient to supply the airport.

The aeronautical facilities on airport are serviced by one complete ring main, while a spur main services surrounding commercial buildings.

Back-up generators are supplied for most aviation-related and some commercial facilities. Two x 1.6MW diesel powered generators are connected to the airport ring main and have four days' fuel capacity. Three additional generators are dedicated to the terminal building to provide power for essential systems.

Future Extensions
The capacity of the existing three PWC feeders would be reached with three medium-sized or one large development. A PWC zone substation will be required at this stage unless PWC can provide a fourth feeder.

Solar Power

Existing Services
In August 2016, DIA commenced operation of a new 4MW photovoltaic (PV) solar array, adjacent to the threshold of Runway 29. This was the first of a two-stage solar project. The Stage 1 facility comprises 15,000 solar panels over six hectares, and produces electricity equivalent to the consumption of 1,000 households. At the time of writing, it is the largest airside photovoltaic solar array in the world.

Stage 2, comprising a smaller array positioned to the north of Runway 18/36, was commissioned in early 2017 and will provide a further 1.5MW of power to the airport.

The environmental benefit of the two solar arrays is significant, providing a 25% reduction in carbon emissions from stationary energy.

The power generated by the system is entirely used within the airport site, and is forecast to meet up to 100% of the airport's peak energy demand in the middle of the day, and to generate 25% of the airport's overall energy needs. In addition to this, the project enables DIA to hedge the exposure of the airport to fluctuations in electricity prices, thus providing greater certainty for the broader airport community and interested investors, partners and stakeholders.

This $13 million solar project is entirely financed by private sector investment, and is the largest 100% private sector investment in solar PV installation in Australia.

Future Extensions
The Stage 1 solar site has the capability to be extended in order to duplicate current solar capacity. DIA is investigating further solar opportunities to extend the airport's development of renewable energy, including utilising available roof space on buildings across the airport's lease area.

Communications

Existing Services
As with all other major international airports there is a range of communications available to airport tenants. Radio and land line communications are largely the responsibility of other authorities.

DIA is investigating the provision of additional communication services in order to provide redundancy for the terminal.

Future Extensions
By 2017, it is expected that the existing telecommunications infrastructure will be replaced by the NBN and new connections made to new developments.

FIGURE 30: 2037 DEVELOPMENT CONCEPT AVIATION SUPPORT FACILITIES AND UTILITIES

SECTION 14

Commercial Development Concept

14

- Of the 311 hectares in the airport lease area, some 80 hectares (26 percent) of the land is available for non-aeronautical commercial development.
- A demand study for the greater Darwin region has estimated that some 153,000m^2 of development could occur in the Service Commercial and Commercial Zones over the next 20 years.

SECTION 14

Commercial Development Concept

Aeronautical activities require the use of the majority of the airport land and aeronautical activities will always remain the priority for Darwin International Airport (DIA). However, there is land that will never be required for aeronautical purposes. In addition there is land that will not be required for aeronautical purposes for many years to come. Both categories can be considered for commercial opportunities and developed for 'highest and best use' on short, medium and long term bases.

Darwin remains a developing economy with significant economic and population growth projected. In that context, the non-aeronautical land holding of DIA is strategic in four respects:

- a central location in the Darwin urban area
- proximity to the aviation activities located at the airport
- provides large parcels of land for development
- proximity to the arterial road network.

In considering commercial development opportunities on airport land there are three primary considerations:

- contributing to Northern Territory economic growth through developing the property business and by facilitating the success of our business partners
- enhancing value to our shareholders
- underpinning infrastructure for further aeronautical development.

COMMERCIAL DEVELOPMENT VISION

Contemporary and high quality building form will be encouraged. Over the planning period, DIA will require increased emphasis on sustainable design, with sustainable design techniques that consider energy and water conservation; a particular example is building orientation that maximises natural light and minimises heat transfer.

A feature of DIA's commercial development philosophy is a focus on enhancing the airport environment and making improved areas publically accessible where possible.

RECENT COMMERCIAL DEVELOPMENTS

Major developments in recent times have included:

- Australian Federal Police (AFP) office building which houses AFP Northern Territory operations as well as the Airport Counter-Terrorist First Response group
- Kingpin Family Entertainment Centre, including bowling alley, climbing wall and laser skirmish
- Caltex service station
- Two car parks constructed for JKC Australia (primary contractor on the Inpex Ichthys project)
- Mercure Darwin Airport Resort 108-room expansion
- Babcock helicopter operations and maintenance facility
- AFP canine training and accommodation building
- Qantas Engineering base
- Careflight / Top End Medical Retrieval Service operations centre and hangar
- Flip Out Indoor Trampoline Arena
- Osgood South Commercial
- New child care facility, adjacent to Osgood South Commercial

Darwin Airport Central

Darwin Airport Central is DIA's business, retail and entertainment precinct, bounded by the two major external roads of Bagot Road and McMillans Road. It covers the 60 hectare Service Commercial Zone along the northern boundary of the DIA site, as shown in the airport's land use plan (refer Figure 3).

Early development of the area began in 2006 with the construction of Bunnings. In 2015 significant development activity of Darwin Airport Central occurred in the vicinity of Neale Street, with the construction of a new Caltex service station and the Kingpin Family Entertainment Centre. This has been followed by the opening of Flip Out Indoor Trampoline Arena in late 2016 adjacent to Kingpin, effectively creating a large-scale entertainment precinct.

The architecturally designed 3200m^2 Osgood South Commercial at the intersection of Neale Street and Osgood Drive provides further business and retail opportunities.


NOW
LEASING
South Osgood Commercial
DARWIN
AIRPORT
CENTRAL.


kingpin
EAT.
BOWL.
PLAY.
MAIN EVENT
ENTERTAINMENT
kingpin
EAT.BOWL.PLAY.

2037 DEVELOPMENT CONCEPT

Of the 311 hectares in the airport lease area, some 80 hectares (26 percent) of the land is available for non-aeronautical commercial development.

The 80 hectares in the Service Commercial, Commercial, and Tourist Commercial Zones will be developed as commercial opportunities arise. A demand study for the greater Darwin region has estimated that some 153,000m^2 of development could occur in the airport's Service Commercial and Commercial Zones over the planning period. Possible developments include commercial offices, showrooms, warehousing, large format and speciality retail, entertainment/ leisure, hotel and other short-stay accommodation, café and restaurants.

Within Darwin Airport Central, it is anticipated that further retail and entertainment developments will evolve in the vicinity of the established entertainment precinct at Neale Street, and may also extend west towards the existing Bunnings site. Further logistics and showroom developments are anticipated to extend east along Osgood Drive past Osgood South Commercial.

Figure 31 illustrates the Service Commercial Zone (Darwin Airport Central) with current commercial development and a possible outline of future commercial development to 2037.

A whole of airport 2037 traffic study, based on both aviation forecasts and the projected 153,000m^2 of commercial development, was undertaken to ascertain future road system requirements (see Section 15).

Land in the Aviation Reservation Zone (41 hectares), while being planned for ultimate Aviation use, can be utilised for a variety of commercial purposes in the short to medium term.

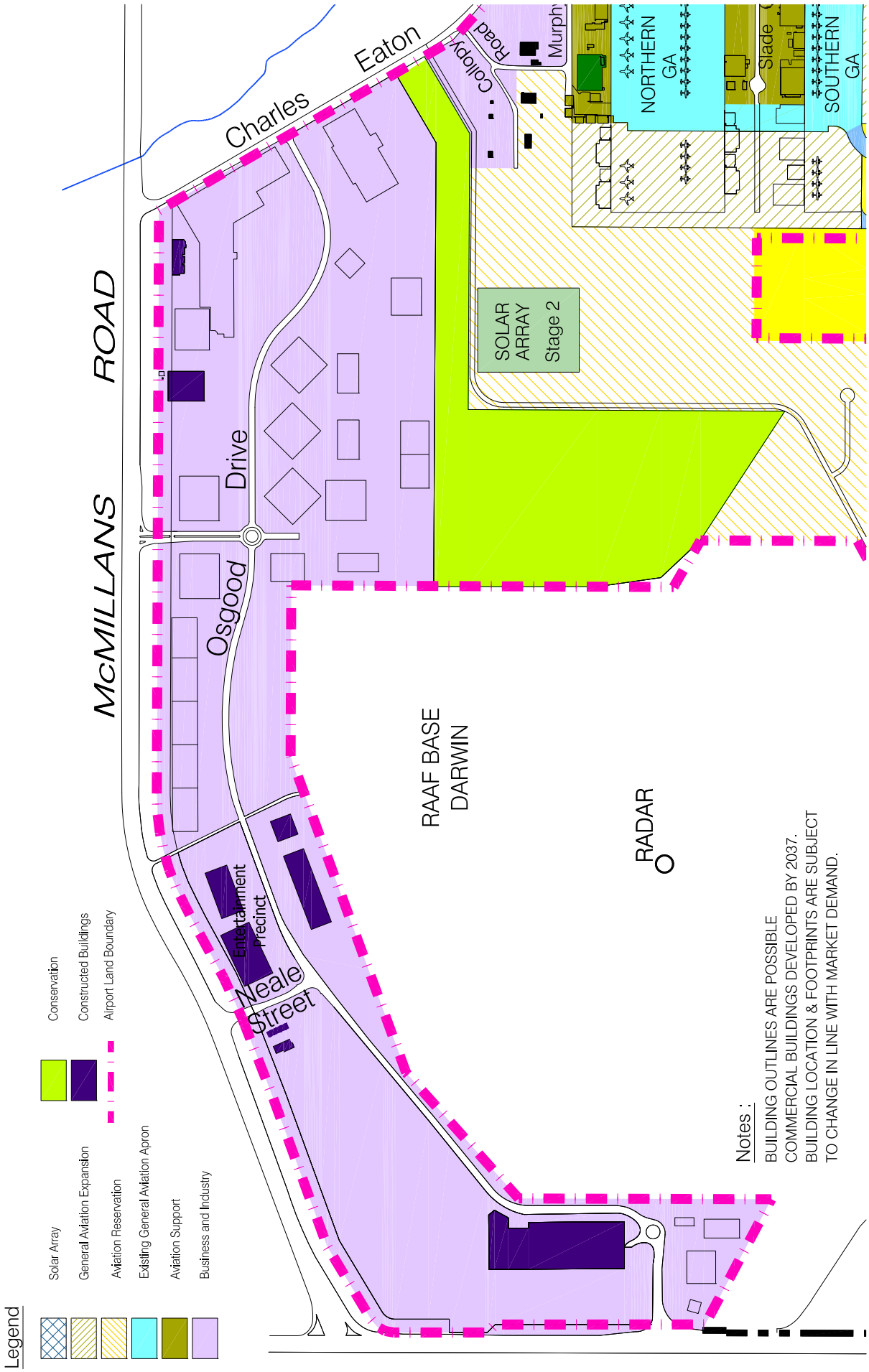
Provision is made for some 30 hectares of land to cater for conservation and recreation activities. DIA will continue to enhance the airport environment and make areas publically accessible where practicable (see Section 16).

Commercial Developments in First Five Years of Master Plan

It is not possible to depict the development timeline for this zone, even for the first 5 years. Developments which occur will be in response to demand. Darwin, and the Northern Territory in general, is still a developing economy (i.e. not a mature economy like south eastern Australia) it is therefore difficult to predict the commercial developments which will occur.

Given this uncertainty, it is however possible that a large format retail development, a medium size light industrial complex, and a modest warehousing and logistics precinct may eventuate in the first five years of the master plan. Further expansion of the entertainment precinct could be expected.

FIGURE 31: 2037 COMMERCIAL DEVELOPMENT CONCEPT



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SECTION 15

Ground Transport Plan Concept

15

- Projected growth in airport traffic will result in an increase in daily vehicle trips from around 14,000 currently to 47,000 in 2037.
- A parking study has indicated a medium term requirement for multi-level parking capacity.
- The major external access development concept is a new all movements signalised intersection off McMillans Road which will connect with Osgood Drive.

SECTION 15

Ground Transport Plan Concept

EXISTING ROAD AND GROUND TRANSPORT SYSTEM

External Access and Internal Road System

Darwin International Airport currently has access to the external road network through:

- The signalised Henry Wrigley Drive off McMillans Road
- The signalised Osgood Drive off Bagot Road
- Charles Eaton Drive and Neale Street off McMillans Road.

DIA's internal road system has developed over time in response to aviation and commercial development and specific traffic requirements. Current airport external access and internal road network are illustrated in the current airport layout shown in Figure 1.

Existing Ground Transport and Parking

Most airport customers and staff arrive by private vehicle or taxi. There is a minimal public bus service to DIA. One aspect which makes it difficult to effectively service the airport with public transport is the large number of flights occurring between 11pm and 7am.

The 2015 Annual Airport Service Quality Survey for DIA identifies the following modes of transport arrival at the airport:

TABLE 20: ARRIVAL AT DIA BY MODE

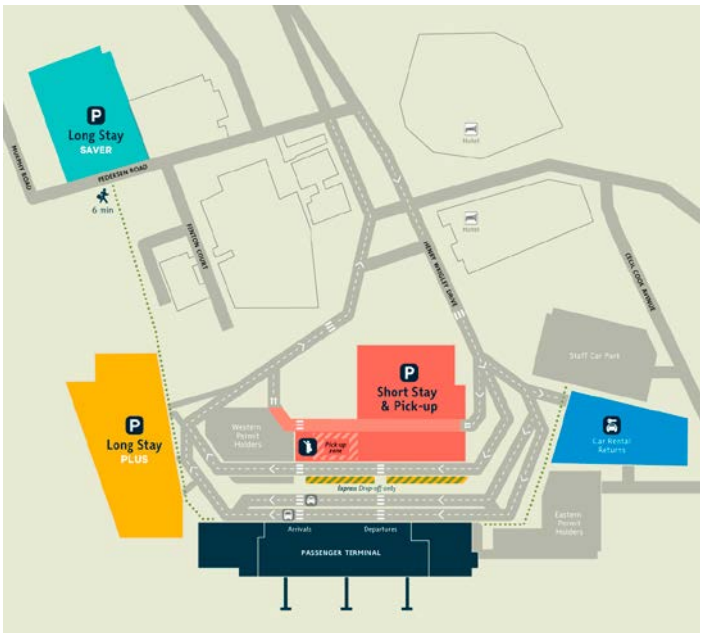
MODE	%
Private vehicle	41
Taxi	25
Shuttle bus	13
Rental car	13
Other	8
Total	100

As can be seen, the car accounts for almost 80% of journeys to the airport.

In 2013, a dedicated express drop-off area was introduced in close proximity to the terminal, along with an improved passenger pick-up area located in the short stay car park.

The provision of vehicle parking spaces at DIA caters for short and long term public car parking, staff car parking, bus/coach parking and car rental storage. There are 1479 public, 315 staff and 300 car rental parking bays at the passenger terminal. Formal and informal public and staff parking areas exist throughout the rest of the airport.

In 2014, DIA undertook a rebranding strategy of its three public car parking products to *Short Stay, Long Stay Plus* and *Long Stay Saver*. Following this, in late 2016 the airport constructed a new staff car park, and redistributed its car parking facilities to provide a better service to customers (see diagram below). The car rental parking bays were relocated to the eastern end of the terminal building, reducing vehicle traffic in front of the terminal building significantly. The relocation of car rental in turn allowed for the expansion of the Long Stay Plus parking facility, almost tripling the number of car parking bays available. In addition to these works, road realignment works on Henry Wrigley Drive in the vicinity of the passenger terminal have been undertaken to improve access to the Short Stay car park, car rental car park, and public drop-off area.



While there is no formal bicycle path network at DIA, there are sealed shoulders on some roads. The airport is in consultation with the NT Department of Transport for an improved bicycle path network in and around the airport. In mid-2016, a new bicycle path along Henry Wrigley Drive outside the DIA lease boundary was constructed by the NT Government, with DIA extending this path in early 2017 to provide bicycle access through to the terminal building. Similarly, a dedicated bicycle parking facility has been constructed in close proximity to the terminal building.

A network of pedestrian footpaths exists connecting the passenger terminal with airport hotel accommodation, car parks and office buildings. In 2015, DIA constructed a new undercover pedestrian walkway connecting the terminal to the Long Stay Saver car park, providing customers with a more sheltered journey.

2037 DEVELOPMENT CONCEPT

Background

The information and development concepts contained within this Master Plan are derived from data collection and detailed traffic modelling studies commissioned by DIA. These studies have involved the development, calibration and testing of microsimulation models for the internal and external road network and provide a sound basis for the land transport proposals.

There are two key demand areas for the ground transport system to 2037:

- demand created by growth in aviation related activities
- demand created by growth of commercial (non-aviation) activity.

The four daily peaks are consistent with the peaks during the previous Master Plan period. The daily peaks are 11pm-3am, 4am-8am, 11am-3pm, 4pm-7pm.

External Road Access

A whole of airport traffic study, based on projected aviation growth and commercial development to 2037 was undertaken. This traffic study incorporated the relevant external road network plus internal airport roads.

Projected growth in both aviation traffic and commercial development is estimated to increase daily airport trips from around 14,000 currently to some 47,000 in 2037 (refer to Table 21 below). One feature of the overall trip generation will be commercial development focused along Osgood Drive.

The major external access development concept is a new all movements signalised intersection off McMillans Road which will connect with Osgood Drive. The new intersection will be located between Rapid Creek Road and Sabine Road and a notional location is illustrated in Figure 32.

It is not considered important to strongly connect commercial with aviation based areas. The philosophy is therefore that the access to the:

- Terminal and Eastern Aviation areas should be retained via Henry Wrigley Drive
- Northern and Southern General Aviation areas are provided via Henry Wrigley Drive, Charles Eaton Drive and the new signalised road
- Service Commercial Zone is provided by means of Osgood Drive, Charles Eaton Drive and the new signalised road.

TABLE 21: ESTIMATED TOTAL TRIPS 2037

DEVELOPMENT	DAILY TRIP GENERATION 2014	DAILY TRIP GENERATION 2037	DAILY INCREASE IN TRIP GENERATION
Terminal + short term parking	11,210	30,210	19,000
Staff car park and long term parking	1,920	5,090	3,170
General aviation (East)	3,310	8,840	5,530
General aviation (Northern and Southern GA, including private JKC Carpark)	1,680	3,990	2,310
Aviation subtotal	16,910	44,750	27,840
Hotel and resort	650	1,100	450
Lifestyle super centre	N/A	13,090	13,090
Gateway commercial and industry	N/A	6,060	6,060
Bunnings and Bagot Rd commercial	6,170	7,160	990
Non-aviation subtotal	6,780	27,470	20,690
TOTAL	**22,470**	**70,780**	**48,310**

The external road access developments envisioned over the planning period are:

- new signalised intersection on McMillans Road (including signalised pedestrian crossing) providing access to the Commercial Zone
- downgrading of the existing intersection of McMillans Road and Charles Eaton Drive to provide left-in and left-out traffic movements only, to coincide with the commissioning of the new signalised intersection
- increased capacity of Henry Wrigley Drive north of Abala Road, and increased turning movement capacity and storage capacity at the intersection of McMillans Road, Rothdale Road, and Henry Wrigley Drive.

The NT Government approved in principle the new signalised intersection on McMillians Road in November 2009. Possible improvements to the intersection of Bagot Road and Osgood Drive are currently under consideration.

The traffic study also recommended capacity improvements of the external road network that are outside the remit of this master plan.
DIA will work with the NT Department of Transport to improve bicycle path capacity within the airport and environs.

Internal Road Network

Key internal roads are Sir Norman Brearley Drive, Osgood Drive, Charles Eaton Drive and Henry Wrigley Drive. The traffic modelling indicated that access to/from the external road system was adequate with the nominated improvements. The internal road network will develop over time in response to demand.

The approach to development of the internal road network will be to:

- maximise the use of existing road capacity
- segregation of passenger and non-passenger (e.g. maintenance, commercial developments) traffic as far as practicable
- progressive enhancement of road system capacity in line with demand
- facilitate aviation and commercial developments.

The alignment of Osgood Drive may be varied to accommodate developments during the planning period. This will not impact on the external road access or traffic movements. Extensions to the internal road system (including bicycle paths) over the planning period will be subject to the normal design considerations and the views of relevant airport customers and other stakeholders.

Ground Transport and Parking

A bus service for the airport commenced in October 2010 primarily catering for persons working on or near the airport. As indicated earlier, almost 100 percent of terminal passengers and general aviation customers arrive by car or private bus services. Hence it is clear that ground transport planning needs to focus on transport to the airport by private vehicle, taxi, rental cars and private shuttle bus services. Even a dramatic expansion of the public bus service level would have little impact on the proportion of passengers utilising the public bus network for travel to the airport.

Ground transport arrangements (including taxi, shuttle bus and private hire cars) will be refined over time in line with any passenger terminal forecourt changes.

Recent expansion of parking capacity at grade will meet short term parking demand at the passenger terminal. A comprehensive parking study has indicated a medium term requirement for multi-level parking capacity. The location of one or more multi-level car parks during the planning period will be subject to detailed planning and design at the time.

More formalised General Aviation car parking is also an issue and will be developed when commercially viable.

Ground Transport Developments in First Five Years of Master Plan

The existing internal road layout is anticipated to only have minimal changes by 2022.

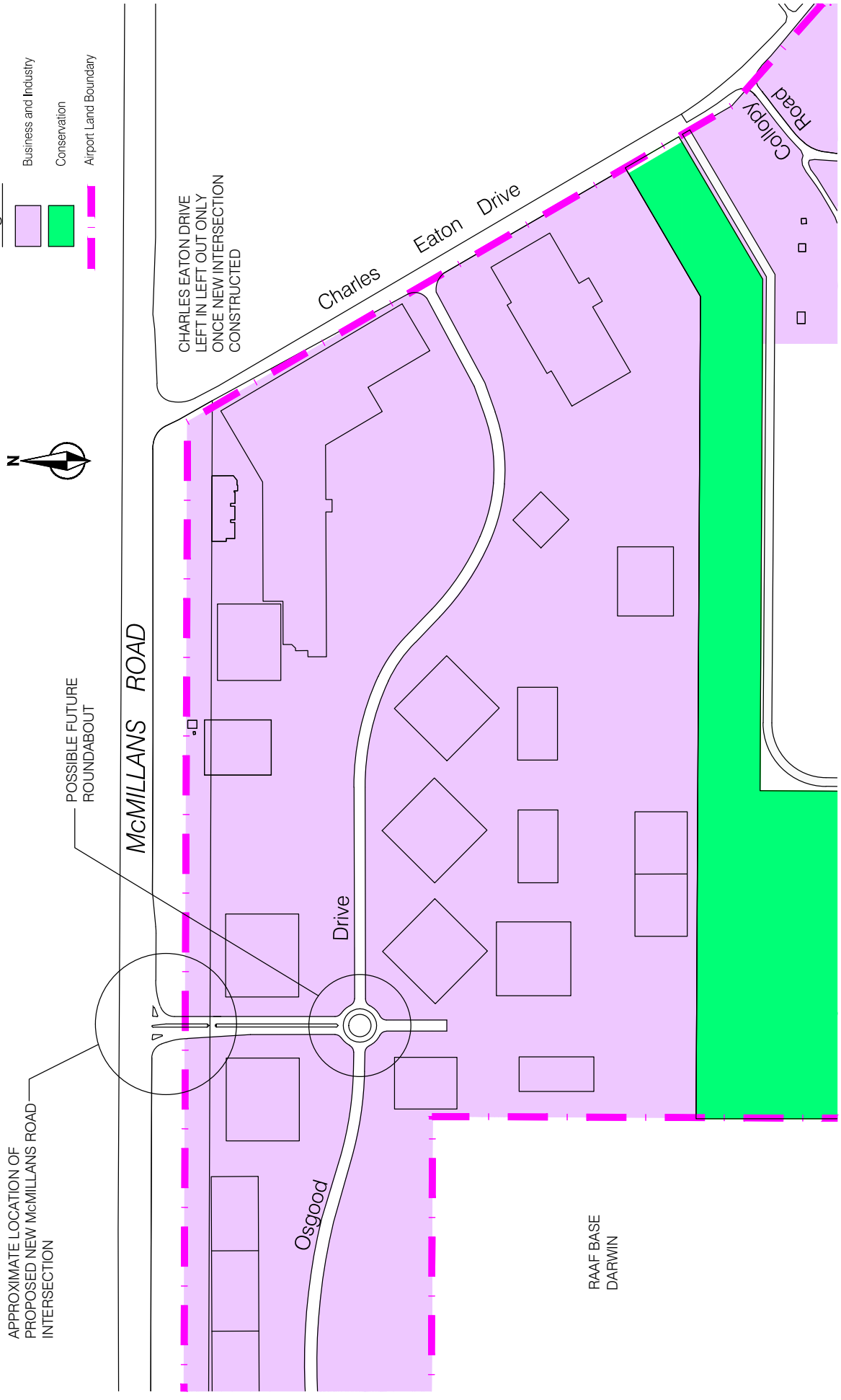
One possible development is the construction of the all movements signalised intersection connecting McMillans Road and Osgood Drive, accompanied by the downgrading of the McMillans Road – Charles Eaton Drive intersection (refer Figure 32). No changes to the remainder of the linkages to the external road network are anticipated during the first five years of the planning period.

The NT Department of Transport has indicated that public bus services to the airport are currently under review, to examine options for an improved public transport network that will significantly improve services to the airport for users.

The current provision of public car parking should suffice during the first five years of the master plan, however this will be reviewed in line with demand. Car rental capacity may be expanded.

In late 2016, the NT Government indicated its intentions to allow ride-sharing services including Uber to commence operations in Darwin. DIA welcomes the opportunity to introduce ride-sharing services as a ground transport option at the airport.

FIGURE 32: FUTURE NEW EXTERNAL ACCESS



SECTION 16

Environmental Management

16

- Darwin International Airport strives to integrate environmental considerations into the development of facilities and services and seeks to minimise their impact on the natural environment.
- The Airport Environment Strategy establishes a framework for assessing compliance against the relevant standards and legislation.

SECTION 16

Environmental Management

AIRPORT ENVIRONMENT STRATEGY (AES)

The Act and the Regulations require that an Airport Environment Strategy (AES) be produced as part of the Master Plan. The AES is a five-year strategic environmental plan for the management of Darwin International Airport (DIA) operations. Its purpose is to ensure relevant environmental standards and legislation are adhered to, and establish a framework for assessing compliance with the standards and legislation. The AES also guides continual improvement of environmental management on the airport.

The AES is relevant to all operations on airport, including both aviation and non-aviation related activities. It has been developed as part of the Darwin International Airport Master Plan. The AES is a key document for ensuring that the forecast growth and development of DIA envisaged in the Master Plan is undertaken in an environmentally responsible manner.

The Airport Environment Strategy, as part of the Master Plan, is the fourth AES for DIA. It replaces the previous AES and will remain in force until development of the next Master Plan.

The Act specifies in Section 71 that an Airport Environmental Strategy must set out:

- Objectives for the environmental management.
- The areas (if any) within the airport site which are identified as environmentally significant.
- The sources of environmental impact associated with airport operations.
- The studies, reviews and monitoring to be carried out by the airport in connection with the environmental impact associated with airport operations.
- The time frames for completion of those studies and reviews and for reporting on that monitoring.
- The specific measures to be carried out for the purposes of preventing, controlling or reducing the environmental impact associated with airport operations.
- The timeframes for completion of those specific measures.
- Details of the consultations undertaken in preparing the strategy (including the outcome of the consultations).
- Any areas within the airport site identified as being a site of indigenous significance.
- The environmental management of areas of the airport site that are, or could be, used for a purpose that is not connected with airport operations.
- The training and programs necessary for appropriate environment management.

Airport Environmental Management

DIA maintains an Environmental Management System (EMS) that is consistent with ISO 14001. The EMS provides the system by which long-term and daily environmental management can be planned, implemented and reviewed, in a cycle of continuous improvement. The EMS also guides environmental response to any future airport developments.

The AES is the cornerstone of the EMS. The AES provides strategic policies, objectives and targets for environmental management of the airport within the EMS framework. This includes monitoring progress, reviewing performance and implementing corrective action for the strategic actions outlined in the AES.

The AES is at Appendix 1 to this Master Plan.

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SECTION 17

Implementation

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- All building activities on airport are assessed by the DIRD appointed Airport Building Controller and Airport Environment Officer.
- The approval of the Final Master Plan does not automatically confer approval on subsequent major developments. Major developments must undergo the Major Development Plan (MDP) process which is the development consent process under the *Airports Act 1996*. The MDP requires ministerial approval under the Act.

SECTION 17

Implementation

IMPLEMENTATION FRAMEWORK

This Master Plan represents current views of developments expected to be realised in a staged manner, largely as a result of increased aircraft movements, passenger demand and commercial development.

Planning, by its nature, is a dynamic activity requiring continuous monitoring of changing conditions, standards and practices, and technology. Therefore, implementation of the Final Master Plan will require flexibility that takes into account fluctuations in economic activity and factors that affect air travel and commercial demand.

The approval of the Final Master Plan does not automatically confer approval on subsequent major developments. The *Airports Act 1996* requires that certain developments must undergo a Major Development Plan (MDP) process which is subject to ministerial approval. Prior to ministerial approval, proposals are subject to further detailed assessment including community consultation, environmental studies, traffic effects and aviation impacts.

All building activities on airport are subjected to Darwin International Airport's internal development review process. The Department of Infrastructure and Regional Development (DIRD) has a role in most airport developments through its statutory office holders – the Airport Building Controller (ABC) and Airport Environment Officer (AEO). The role of the ABC is to administer the *Airports (Building Control) Regulations 1996* and the AEO oversees adherence to the approved AES and administers the *Airports (Environmental Protection) Regulations 1997*. Hence, a regulatory and development consent process is still applied.

The Aviation Reservation Zone provides for eventual aviation use but with interim (short to medium term) non-aviation/ commercial use.

REVIEW PROCESS

The *Airports Act 1996* provides for a Final Master Plan to remain in force for five years. The Act includes additional provisions for minor amendments to the Master Plan, and for the Minister to direct another Master Plan to be prepared.

SECTION 18

Assessment as to Consistency with the *Airports Act 1996*

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- Darwin International Airport 2017 Master Plan is consistent with the requirements of the *Airports Act 1996*.

SECTION 18

Assessment as to Consistency with the *Airports Act 1996*

TABLE 22: ASSESSMENT AS TO THE CONSISTENCY WITH THE *AIRPORTS ACT 1996* AND ASSOCIATED REGULATIONS

LEGISLATION	FINAL DETAILS IN SECTION OF THE MASTER PLAN
AIRPORTS ACT 1996	
70 Final Master Plan	
(1) For each airport, there is to be a final master plan.	Section 3
(2) The purposes of a final master plan for an airport are:	
(a) to establish the strategic direction for efficient and economic development at the airport over the planning period of the plan; and	Section 5, 8, 9, 12, 13, 14 and 15
(b) to provide for the development of additional uses of the airport site; and	Section 8, 9, 13, 14 and 15
(c) to indicate to the public the intended uses of the airport site; and	Section 8, 9, 12, 13, 14 and 15
(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; and	Section 8, 10 and 11
(e) to ensure that all operations at the airport are undertaken in accordance with relevant environmental legislation and standards; and	Section 16 and Appendix 1
(f) to establish a framework for assessing compliance at the airport with relevant environmental legislation and standards; and	Section 16 and Appendix 1
(g) to promote the continual improvement of environmental management at the airport.	Section 16 and Appendix 1
71 Contents of draft or final master plan (joint-user airports)	
(3) In the case of a joint-user airport, a draft or final master plan must specify:	
(a) the airport-lessee company's development objectives for civil use of the airport; and	Section 5
(b) the airport-lessee company's assessment of the future needs of civil aviation users of the airport, and other civil users of the airport, for services and facilities relating to the area of the airport site leased to the company; and	Section 7, 8, 9, 12, 13, 14 and 15
(c) the airport-lessee company's intentions for land use and related development of the area of the airport site leased to the company, where the uses and developments embrace:	
(i) in all cases – landside, surface access and land planning/zoning aspects; and	Section 8, 9, 12, 13, 14, 15
(ii) if the leased area includes one or more runways or taxiways – airside aspects; and	Section 8, 9, 12, 13
(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	Section 11
(da) flight paths (in accordance with regulations, if any, made for the purpose of this paragraph) at the airport; and	Section 11
(e) 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 the Defence Department, for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels; and	Section 11
(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	Section 16 and Appendix 1
(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	Section 16 and Appendix 1
(ga) in relation to the first 5 years of the master plan – a plan for a ground transport system on the landside to the airport that details:	
(i) a road network plan; and	Section 15
(ii) the facilities for moving people (employees, passengers and other airport users) and freight at the airport; and	Section 15
(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	Section 15

LEGISLATION	FINAL DETAILS IN SECTION OF THE MASTER PLAN
(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	Section 15
(v) the capacity of the ground transport system at the airport to support operations and other activities at the airport; and	Section 15
(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	Section 15
(gb) in relation to the first 5 years of the master plan – detailed information on the proposed developments in the master plan that are to be used for:	
(i) commercial, community, office or retail purposes; or	Section 14
(ii) for any other purpose that is not related to airport services; and	Section 8 and 14
(gc) in relation to the first 5 years of the master plan – the likely effect of the proposed developments in the master plan on:	
(i) employment levels at the airport; and	Section 6
(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	Section 6, 8 and 14
(h) an environment strategy that details:	
(i) the airport-lessee company's objectives for the environmental management of the airport; and	Appendix 1
(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	Appendix 1
(iii) the sources of environmental impact associated with civil aviation operations at the airport; and	Appendix 1
(iv) the studies, reviews and monitoring to be carried out by the airport-lessee company in connection with the environmental impact associated with civil aviation operations at the airport; and	Appendix 1
(v) the time frames for completion of those studies and review and for reporting on that monitoring; and	Appendix 1
(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 civil aviation operations at the airport; and	Appendix 1
(vii) the time frames for completion of those specific measures; and	Appendix 1
(viii) details of the consultations undertaken in preparing the strategy (including the outcome of the consultations); and	Section 4
(ix) any other matters that are prescribed in the regulations; and	Appendix 1
(i) such other matters (if any) as are specified in the regulations.	See below
Paragraphs (a) to (h) do not, by implication, limit paragraph (j).	
Matters provided by regulations	
(6) In specifying a particular objective or proposal covered by paragraph (2)(a), (c), (ga), (gb) or (gc) or (3)(a), (c), (ga), (gb) or (gc), a draft or final master plan must address:	Section 8 and 20
(a) the extent (if any) of consistency with planning schemes in force under a law of the State in which the airport is located; and	Section 8 and 20
(b) if the draft or final master plan is not consistent with those planning schemes – the justification for the inconsistencies.	Section 8 and 20
(7) Subsection (6) does not, by implication, limit subsection (5).	
Company to have regard to Australian Standard	
(8) In developing plans referred to in paragraph (2)(e) and (3)(e), an airport-lessee company must have regard to Australian Standard AS2021 2000 ("Acoustics Aircraft noise intrusion Building siting and construction") as in force or existing at that time.	Section 11
(9) Subsection (8) does not, by implication, limit the matters to which regard may be had.	
(10) In this section: airport service means a service provided at an airport, if the service is necessary for the purposes of operating or maintaining civil aviation services at the airport, and includes the use of facilities at the airport for those purposes.	
71A Draft or final master plan must identify proposed sensitive developments	
(1) A draft or final master plan must identify any proposed sensitive development in the plan.	Section 8

LEGISLATION	FINAL DETAILS IN SECTION OF THE MASTER PLAN
AIRPORTS REGULATIONS 1997 – REG 5.02	
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:	
(a) any changes 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;	Section 10
(b) for an area of an airport where a change of use of a kind described in subregulation 6.07(2) of the *Airports (Environment Protection) Regulations 1997* is proposed:	No such changes of use proposed.
(i) the contents of the report of any examination of the area carried out under regulation 6.09 of those Regulations; and	As above
(ii) the airport-lessee company's plans for dealing with any soil pollution referred to in the report.	As above
(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.	Section 8 and 20
(3) For subsection 71(5) of the Act, a draft or final master plan must:	
(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; and	Section 8
(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.	Section 8
(4) In subregulation (1): OLS and PANS-OPS surface have the same meanings as in the Airports (Protection of Airspace) Regulations.	

SECTION 19

Acronyms

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SECTION 19

Acronyms

ABC	Airport Building Controller
AEO	Airport Environment Officer
AES	Airport Environment Strategy
ALC	Airport Lessee Company
ANEC	Aircraft Noise Exposure Concept
ANEF	Australian Noise Exposure Forecast
ARFFS	Aviation Rescue and Fire Fighting Service
ATC	Air Traffic Control
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations
CAT	Category
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CTFR	Counter Terrorism First Response
DIA	Darwin International Airport Pty Ltd
DIRD	Department of Infrastructure and Regional Development
DLPE	Department of Lands, Planning and the Environment
DME	Distance Measuring Equipment
EDMP	Exposure Draft Master Plan
EMS	Environmental Management System
ERSA	EnRoute Supplement Australia
ESR	Environmental Sites Register
EO	Explosive Ordinance
FATO	Final Approach and Take Off
FTE	Full-Time Equivalent
FSC	Full Service Carrier
FTE	Full Time Equivalent
GA	General Aviation
GANT	Greening Australia Northern Territory
GDP	Gross Domestic Product
GNSS	Global Navigation Satellite System
GSE	Ground Service Equipment
GSP	Gross State Product
HIAL	High Intensity Approach Lighting
HV	High Voltage
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
ILS	Instrument Landing System
ITC	Information Technology and Communications
JAFS	Joint Aviation Fuel Services
LAHSO	Land & Hold Short Operations
LCC	Low Cost Carrier
LMP	Landscaping Master Plan
MAX	Maximum
MDP	Major Development Plan
MHS	Military Hard Stand
MOS	Manual of Standards
MP	Master Plan
MTOW	Maximum Take Off Weight
N60	Noise Events Louder than 60dB(A)
N70	Noise Events Louder than 70dB(A)
NASF	National Airports Safety Framework
NASAG	National Airports Safety Advisory Group
NFPMS	Noise and Flight Path Monitoring System
NDB	Non-Directional Beacon
NT	Northern Territory
NTG	Northern Territory Government
OCS	Obstruction Clearance Surfaces
OLA	Ordnance Loading Area
OLS	Obstacle Limitation Surfaces
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations
PAPI	Precision Approach Path Indicator
PCN	Pavement Classification Number
PDMP	Preliminary Draft Master Plan
PWC	Power and Water Corporation
RAAF	Royal Australian Air Force
RPT	Regular Public Transport
SRA	Security Restricted Area
TACAN	TACtical Air Navigation
TEMRS	Top End Medical Retrieval Service
TSP	Transport Security Program
TWY	Taxiway
VHF	Very High Frequency
VOR	Very High Frequency Omni-directional Range
WSUD	Water Sensitive Urban Design

SECTION 20

Definition of Land Uses

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SECTION 20

Definition of Land Uses

Note:

Black denotes those Precincts and Land Uses identical to the NT Planning Scheme

Red denotes those Precincts and Land Uses that have been amended from those in the NT Planning Scheme to appropriately reflect on-site aviation and non-aviation land uses and activities

Blue denotes independent definitions for aviation Precincts and Land Uses not provided in the NT Planning Scheme

animal boarding	means premises used as a commercial enterprise for the accommodation or breeding of domestic animals.
aviation activity	means any activity for the arrival, departure, movement or operation of aircraft and includes aircraft aprons, helipads, heliports, runways, taxiways, areas set aside for the parking and or storage of aircraft either short or long term, and the like.
aviation support facility	means any aircraft maintenance facility, engine-run area, ground support equipment, transport depot and associated ground base activities necessary for the orderly and efficient operation of aviation activity.
business sign	means a device using words, letters or images exhibited for the purpose of advertising, announcement or display restricted to the name of the business carried on and the nature of the services or goods available, on the land on which the sign is erected, and includes, where a number of persons are carrying on different businesses on that land, a sign identifying the place.
caravan park	means land used for the parking of caravans or the erection or placement and use of tents or cabins for the purpose of providing accommodation.
car park	means the parking of motor vehicles, including buses and trucks, otherwise than as an ancillary use of land.
child care centre	means premises used for the caring for 17 or more children.
community centre	means a building or part of a building designed or adapted primarily to provide facilities for social, sporting or cultural purposes but does not include premises licensed under the Liquor Act.
education establishment	means an academy, college, lecture hall, technical college or university, but does not include a place of worship.
fuel depot	means a depot for the storage or sale of solid, liquid or gaseous fuel, but does not include a service station.
general aviation and support facilities	means any aviation and aviation related use of the land. General aviation commonly refers to that part of the aviation industry that engages in activity other than scheduled commercial airline activity. This may include charter operations, aeromedical operations, agricultural aviation businesses, aviation-based firefighting services, training and aerial work such as aerial photography and surveying. It also includes private, business, recreational and sports aviation activity and supporting businesses such as maintenance providers.
general industry	means an industry other than a light industry or a rural industry.
helipad	means a place not open to the public, used for take-off and landing of helicopters.
heliport	means a place not open to the public, used for the take-off and landing of helicopters whether or not it includes: (a) a terminal building; (b) facilities for parking, storage or repair of helicopters.
hostel	includes boarding houses, guest houses, lodging houses and other premises used to provide board or lodging with communal toilet, ablution, dining or cooking facilities but does not include home based visitor accommodation or a group home.
hotel	means premises which require a licence under the Liquor Act and where, as a principal part of the business, alcoholic beverages are ordinarily sold to the public for consumption on the premises whether or not accommodation is provided for members of the public and whether or not meals are served, but does not include a licensed club, motel or restaurant.

industry	includes the following operations: (a) the carrying out of a process of manufacture whether or not to produce a finished article; (b) the dismantling of an article, machinery or vehicle; (c) the treatment of waste materials; (d) the packaging of goods or machinery; (e) the process of testing or analysis of an article, goods or materials; (f) the storage of goods, equipment or vehicles not in association with any other activity on the site, but not including transport terminal, vehicle sales and hire or warehouse; and if on the same land as any of the operations referred to in paragraphs (a) to (f) above: (g) the storage of goods used in conjunction with or resulting from any of the above operations; (h) the provision of amenities for persons engaged in the operations; (i) the sale of goods resulting from the operations; (j) any work of administration or accounting in connection with an operation; (k) an industry or class of industry particularly described in this Scheme, but does not include motor body works, motor repair station or a home occupation.
leisure and recreation	means the provision indoors or outdoors of recreation, leisure or sporting activities and includes cinemas, theatres, sporting facilities and the like as a commercial enterprise but does not include a licensed club or community centre.
licensed club	means premises used as club rooms which require a licence under the Liquor Act.
light industry	means an industry in which the process carried on, the machinery used and the goods and commodities carried to and from the premises on which the industry is sited are not of such a kind as are likely to adversely affect the amenity of the surrounding locality by reason of the emission of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.
medical clinic	means a building or place used by one or more medical practitioners, physiotherapists, dentists or persons ordinarily associated with health care, or their employees, but does not include a hospital.
motel	means premises wholly or principally used for the accommodation of travellers and the vehicles used by them, whether or not the building is also used to provide meals to the travellers or to members of the general public and whether or not the premises are licensed under the Liquor Act, but does not include bed and breakfast accommodation.
motor body works	means premises for repairing the body work of motor vehicles and includes body building, panel beating or spray painting of motor vehicles.
motor repair station	means premises used for carrying out repairs to motor vehicles but does not include a motor body works or a transport terminal.
navigational aids	means any aircraft surveillance equipment, control towers, radars, visual and non-visual navigation aids and the like.
office	means a building or part of a building used for the conduct of administration whether public or otherwise, the practice of a profession, or the carrying on of mercantile, banking, insurance, legal, clerical or similar services, but does not include a home occupation.
passenger terminal	means premises used as a railway or bus station, shipping passenger terminal, airline passenger terminal, hoverport or heliport.
place of worship	means premises used as a church, chapel, mosque, temple, synagogue or place of religious instruction or worship or for the purpose of religious training.
plant nursery	means premises principally used for the growing and/or display of plants for sale, whether or not seeds, equipment, soil, sand, rocks, railway sleepers or other associated products are displayed or sold, but does not include the use of land for agriculture or horticulture.
promotion sign	means a device using words, letters or images exhibited for the purpose of advertising, announcement or display which contains information relating to: (a) goods, services or products not provided, produced or sold; (b) events or activities which are not carried on; (c) on the land or in the building on which the sign is constructed or erected.
restaurant	means premises (other than a shop, or part of a hotel or a motel) in which meals are served to the public whether or not the premises provides a drive-through service or requires a licence under the Liquor Act.
rural industry	means an industry which involves the treatment, processing or packing of primary products transported to the site where the goods and commodities carried to or from the premises on which the industry is sited, are not of such a kind as are likely to adversely affect the amenity of the surrounding locality.
service station	means premises used for the sale by retail of fuels, oils and other products for use in connection with the operation of motor vehicles, whether or not it includes convenience shopping, but does not include a fuel depot, motor repair station or motor body works.
shop	means premises used for the display and sale by retail or for hire of goods or services but does not include a restaurant, retail agricultural stall, service station, showroom sales or vehicle sales and hire.
short-stay accommodation	means hotel and/or motel style accommodation which has been specifically designed for short stay business or tourist accommodation and which is not subject to a residential lease.

showroom sales	means the sale or hire in premises of goods of a bulky nature including: (a) furniture, floor coverings, furnishings, household appliances or camping gear; (b) materials, tools, equipment or machinery for use in industry, commerce, the trades, primary production, medical purposes or party hire.
transport terminal	means premises used for the: (a) loading, discharge or storage of goods in the course of the transport of those goods by air, road, rail or ship; (b) garaging and basic maintenance of fleet vehicles; (c) servicing, repair and garaging of buses.
utilities and infrastructure	means a road, traffic lights, stormwater drains, disposal of sewage and waste water, facilities for the reticulation of services, telecommunications facilities, electricity substations and electricity transmission facilities, including sustainable generation systems, and the like.
vehicle sales and hire	means premises used wholly or principally for the display for sale by retail or for rental of motor vehicles, caravans, trailers, farm machinery or boats but does not include motor body works, motor repair station, a shop or showroom sales.
veterinary clinic	means premises used for the medical treatment of animals, whether or not the animals are boarded there as part of the treatment.
warehouse	means premises used for the bulk storage of goods, or the display and sale of goods by wholesale.

SECTION 21

Glossary and Aviation Terminology

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SECTION 21

Glossary and Aviation Terminology

AIRCRAFT NOISE TERMS

Aircraft Noise Exposure Concept (ANEC)

A set of contours based on hypothetical aircraft operations at an airport in the future. As ANEC maps are based on hypothetical assumptions and may not be subject to review or endorsement, they have no official status and cannot be used for land use planning purposes. An ANEC however, can be turned into an ANEF.

Australian Noise Exposure Forecast (ANEF)

A set of contours showing future forecasted levels of exposure to noise. The ANEF is the only type of noise map intended to be used to assist land use planning decisions. ANEF maps are subject to technical review and endorsement by Airservices Australia.

Flight Path

These maps provide an indication of where aircraft fly and how many over flights there are over a particular period.

N70 Chart

N70 Chart provides a guide to aircraft noise which is more explanatory than an ANEF. N70 refers to the number of noise events louder than 70 dB(A) over a particular period. The level of 70 dB(A) has been chosen because it is equivalent to the single event level of 60dB(A) specified in the Australian Standards AS2021 as the indoor design sound level for normal domestic areas in dwellings.

AIRFIELD TERMS

Aerodrome/Airport

A defined area of land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aircraft Operator

A person, organisation or enterprise engaged in or offering to engage in aircraft operation.

Airport Operator

Any owner, licensee, authority or corporation, or any other body which has legal responsibility for a particular aerodrome. (e.g. Darwin International Airport Pty Ltd).

Airside

The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.

Aprons

An apron is a defined area for the aircraft parking. An apron area enables passengers to board or disembark from an aircraft, loading of freight onto, or unloading freight from, an aircraft; and refuelling, parking or carrying out maintenance on aircraft in between flights.

Explosive Ordnance

Equipment carried in an aircraft designed to detonate with explosive force.

General Aviation

General Aviation (GA) commonly refers to that part of the aviation industry that engages in activity other than scheduled commercial airline activity. This may include charter operations, aero medical operations, agricultural aviation businesses, aviation-based fire-fighting services, training and aerial work such as aerial photography and surveying. It also includes private, business, recreational and sports aviation activity and supporting businesses such as maintenance providers.

Joint-User

An airport under the control of a part of the Defence Force in respect of which an arrangement under Section 20 of the Civil Aviation Act is in force.

Gate

Physical location where passengers depart/arrive at the terminal to access aircraft either directly from contact stands or by walking from remote stands.

Landside

Those parts of an aerodrome not considered airside, that is, areas normally accessible to the general public.

Manoeuvring Areas

Those parts of an aerodrome used for the take-off, landing and taxiing of aircraft, excluding aprons.

Movement Areas

Those parts of an Aerodrome used for the take-off, landing taxiing and parking of aircraft (i.e. the manoeuvring area plus the aprons)

Runways

Defined area provided for the landing and taking off of aircraft. Darwin International Airport has 2 runways, which are identified by international convention by a two-part designator derived from the direction in which the aircraft is flying:

- Runway 11/29 is the main east-west runway
- Runway 18/36 is the secondary north-south runway.

Runway Strips

Defined area surrounding a runway and are provided to reduce the risk of damage to aircraft running off runways and also to provide obstacle-free airspace for aircraft flying over the area during take-off and landing operations.

Stand / Bay

Physical location where an aircraft parks, also referred to as an aircraft parking position.

Taxiways

Taxiways are defined paths providing safe and expeditious surface movement of aircraft between the runway and aprons.

Thresholds

Thresholds are the points on the runway for which the landing distance available to an aircraft is measured. A threshold is determined with reference to obstacle-free approach gradient required for the particular category of runway. Where there is no obstacle infringement, the threshold and runway end normally coincide. Where obstacles infringe the approach surface it is necessary to displace the threshold to achieve the required obstacle free gradient.

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SECTION 22

Figures and Tables

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FIGURES

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Appendix 1

AIRPORT ENVIRONMENT STRATEGY

Darwin International Airport

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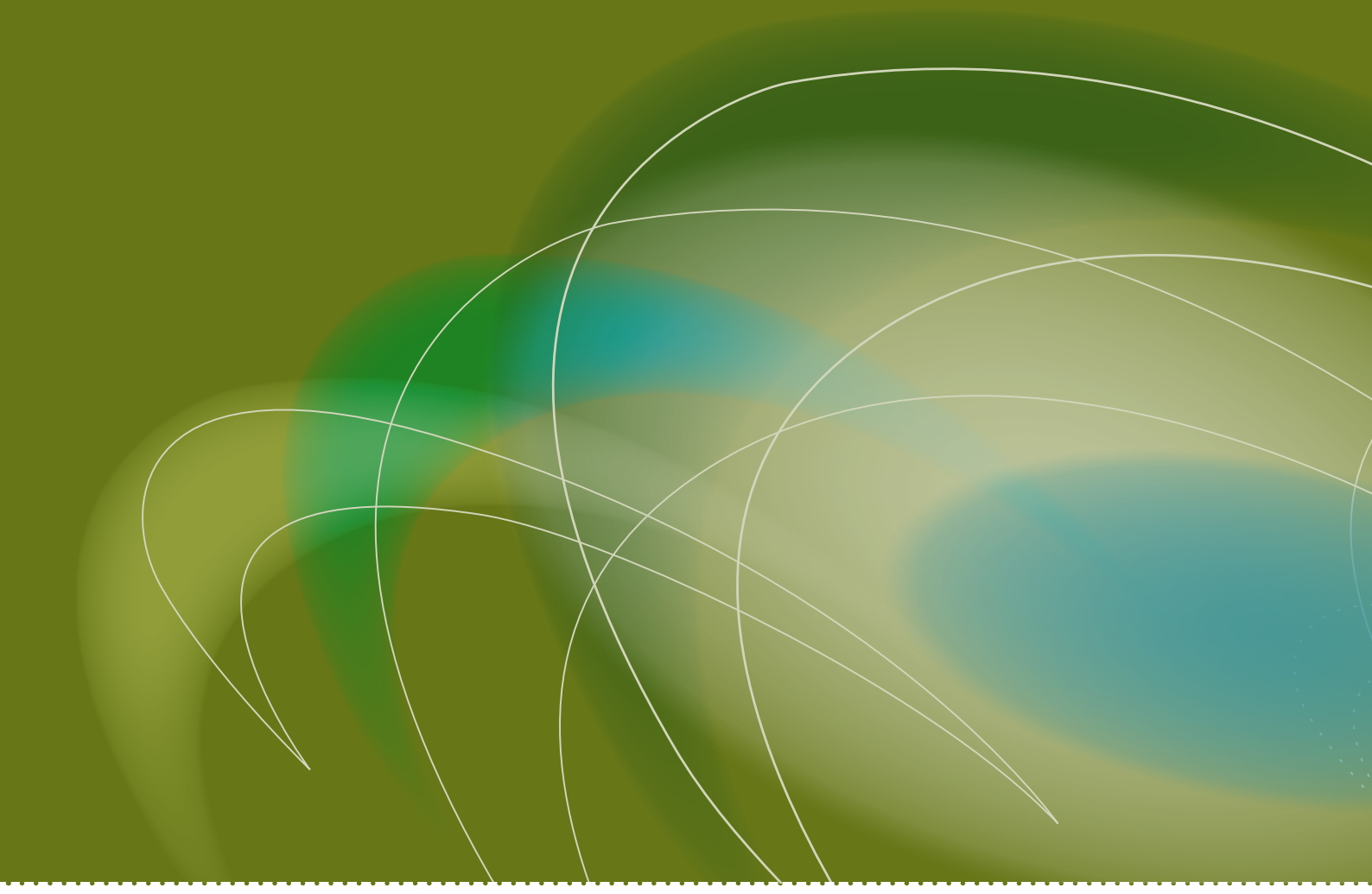
SECTION 1

Introduction

1

- The Airport Environment Strategy (AES) is a five year strategic plan for the environmental management of Darwin International Airport.
- This AES is relevant to all aviation and non-aviation activities on airport undertaken by staff, tenants and contractors.
- DIA is committed to continual improvement and will continue to build on the environmental initiatives and improvements achieved over the previous AES periods.



SECTION 1

Introduction

1.1 BACKGROUND

Darwin International Airport Pty Ltd (DIA) has a 50 year lease plus 49 year option over the Darwin International Airport from the Commonwealth of Australia under the *Airports Act 1996*. DIA is also a joint-user airport under the *Airports Act 1996* and a joint-user deed with the Department of Defence governs the co-located operation of DIA and Royal Australian Air Force (RAAF) Base Darwin.

This Airport Environment Strategy (AES) is a five year plan providing the strategic framework for DIA's commitment to environmental management, with actions to be implemented over the next 5 years to ensure continual improvement in all aspects of environmental management across the airport site.

Some of DIA's major environmental achievements since the 2009 AES are detailed in Table 1.

TABLE 1: MAJOR ENVIRONMENT ACHIEVEMENTS SINCE 2009 AES

ACHIEVEMENT	TARGET ACHIEVED
PowerWater Corporation Melaleuca Awards 2011; Commercial /Industrial category (Energy Reduction)	2011
NT Urban Landcare award 2011	2011
Finalist: National Landcare Awards 2012; Urban Landcare Category	2012
Ongoing management and improvements to the Rapid Creek Reserve including the upgrade of the Gurambai Walking Trail	2015
Solar photovoltaic array 1 and 2 completed and brought online, with NT Airports receiving recognition with the Airport Innovation and Excellence Award for Environmental Management at the Australian Airports Association industry awards ceremony	2016
Development of informative user guidelines for Environmental Management and spill response at the airport	2015

DIA's commitment to environmental management and sustainability looks to not only comply with relevant regulatory requirements but also to build on these to move towards best practice in the development of future environmental initiatives. DIA works closely with Commonwealth, Territory and local agencies including participation in working groups and interagency committees. DIA also works closely with local communities and interest groups

The AES ensures relevant legislation, regulations and environmental standards are incorporated into all operations on airport, including both aviation and non-aviation related activities carried out by DIA staff, tenants and contractors.

The strategy has been developed as part of the Darwin International Airport 2017 Master Plan in consultation with government agencies, airport tenants, the local community and relevant key stakeholders by way of circulation of an exposure draft. This has also included a preliminary exhibition of communications and messaging associated with the Master Plan and AES and a number of face to face sessions.

1.2 LOCATION

DIA is located approximately 13km by road northeast of the city of Darwin in the Northern Territory. The airport is bounded by:

- The Stuart Highway and the industrial area of Winnellie to the south.
- McMillan's Road and Marrara sporting fields to the north.
- Bagot Road and residential and service commercial areas to the west.
- Amy Johnson Avenue and Marrara wetlands to the east.

Darwin is located in the wet/dry tropics and experiences 4-6 months of intense high rainfall followed by extended periods of little to no rainfall. This extreme climate provides its own unique environmental management issues including flooding and high levels of erosion and sedimentation in the wet season, followed by near drought and high fire danger in the dry season.

1.3. OPERATIONS

In 2016, total passenger numbers at DIA reached over 2.2 million per year. Domestic passengers currently account for approximately 80% of total passenger numbers, with international passengers making up the remaining 20%. The runway system at the airport consists of two intersecting runways. The main runway, with an orientation of 11/29, has a length of 3,354 metres and a width of 60 metres. The crosswind runway has an orientation of 18/36, with a length of 1,524 metres and a width of 30 metres. Both runways have a full length parallel taxiway. The regular public transport (RPT) apron can accommodate up to 17 large aircraft in various combinations.

Additional infrastructure at DIA includes:

- Two level, 27,000m^2 terminal building
- Air Traffic Control (operated by RAAF)
- Aircraft maintenance hangars
- Air freight facilities
- Refuelling and other aeronautical service related facilities
- Two large scale solar farms

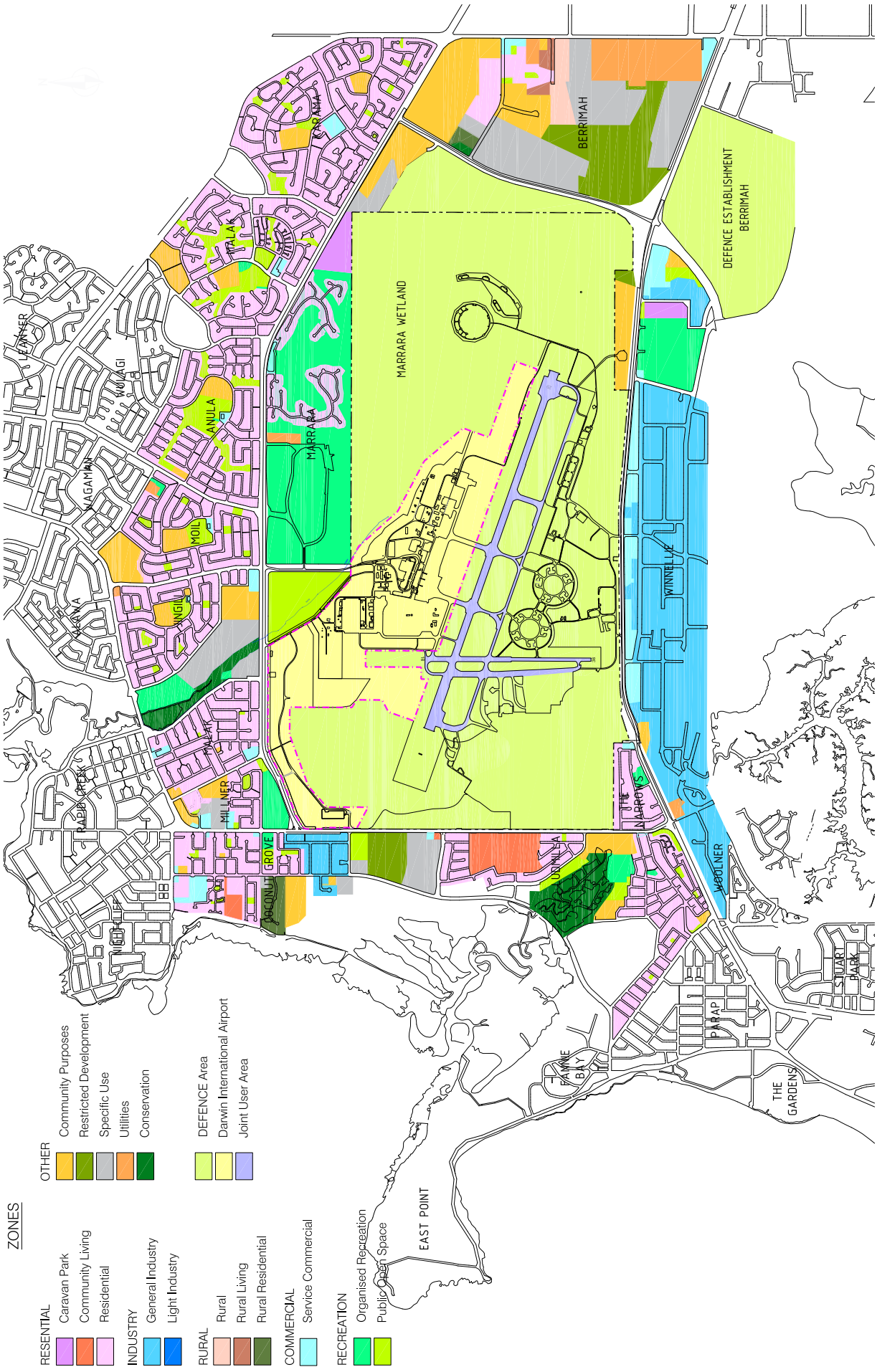
Business activities undertaken within the DIA lease boundary include:

- Medical and surveillance services
- Biosecurity Services (Department of Agriculture and Water Resources), Department of Environment and Energy, and Civil Aviation Safety Authority (CASA) offices
- Flight Catering facilities
- Air charter, flight training and recreational flight operations
- Rental car facilities
- Accommodation facilities
- Retail and commercial operations
- Car parking
- Childcare facilities
- Boarding kennels
- Recreational entertainment
- Service station

1.4. SURROUNDING LAND USE

Residential use and some open space occurs adjacent to DIA on its northern boundary, comprised of the suburbs of Coconut Grove, Millner, Jingili, Moil, Anula, Malak and Karama (refer to Figure 1). The land south of the airport is predominantly open space adjoined by service commercial/light industrial uses in the suburb of Winnellie, The Narrows and Eaton residential areas and Department of Defence operations. Commercial service areas are situated west of the airport. The Marrara Swamp, Rapid Creek and various sporting facilities bound the airport to the east. Rapid Creek and Marrara Swamp are considered environmentally significant as the creek is the only fresh water body in Darwin. To the west the airport is bounded by a special purpose lease to an indigenous organisation, and the residential suburb of Ludmilla.

FIGURE 1: DARWIN INTERNATIONAL AIRPORT LEASE SITE AND SURROUNDING LAND USE



SECTION 2

Airport Legislation Framework

- The *Airports Act 1996* and subsidiary regulations specify the content of an Airport Environment Strategy.
- Consultation with government, business and community is a prominent part of the Airport Environment Strategy development process.
- The Airport Environment Strategy, as part of the Airport Master Plan, and must be submitted to the Federal Minister for Infrastructure and Transport for approval.
- The Final (approved) Master Plan, including the Airport Environment Strategy, is valid for five years.

SECTION 2

Airport Legislative Framework

2.1. AIRPORT LEGISLATION AND REGULATION

The *Airports Act 1996* and subsidiary regulations were enacted by the Commonwealth to provide a regulatory framework for the operation and development of federal airports in Australia leased to non-governmental enterprises.

Airports Act 1996 (the Act) – establishes the system by which airport operators / other users are required to abide. Part 5 directs the airport lessee company to develop an AES as part of the airport's Master Plan.

Airports (Environment Protection) Regulations 1997 (the Regulations) – outlines standards and imposes requirements for the management of environmental impacts and they also provide for monitoring, reporting and remedial action.

Also significant in the airport regulatory framework is the Environment Protection and Biodiversity Conservation Act 1999, which provides for the management and protection of Australian and internationally significant species of flora, fauna, ecological communities and heritage places.

In the event federal legislation does not address an environmental issue or standard, Northern Territory (NT) legislation is applicable. NT legislation applies to such issues as pests and pathogens, hazardous substances and dangerous goods, water quality, and native vegetation. Pollution or noise generated by aircraft during flight, landing, taking off or taxiing is regulated under the *Air Navigation (Aircraft Engine Emissions) Regulations 1998* and the *Air Navigation (Aircraft Noise) Regulations 1984* and are not the responsibility of the airport lessee company.

The AES covers all environmental matters arising from the operation and development of the DIA site in accordance with the relevant legislation. Each of the sections detailed in this AES respond directly to a specific requirement or key environmental aspect, as stated in the legislation. Section 5 references compliance with the regulation relevant to the AES.

The Department of Infrastructure and Regional Development (DIRD) manages the administration of the Government's interests in privatised airports under the Act. DIRD appoints the Airport Environment Officer (AEO) and the Airport Building Controller (ABC) to administer elements of the Act and relevant regulations at the airport.

The AEO oversees adherence to the approved AES and administers the Regulations. The role of the ABC is to administer the *Airports (Building Control) Regulations 1996.*

DIA submits an Annual Environment Report to DIRD as required under the Regulations, detailing:

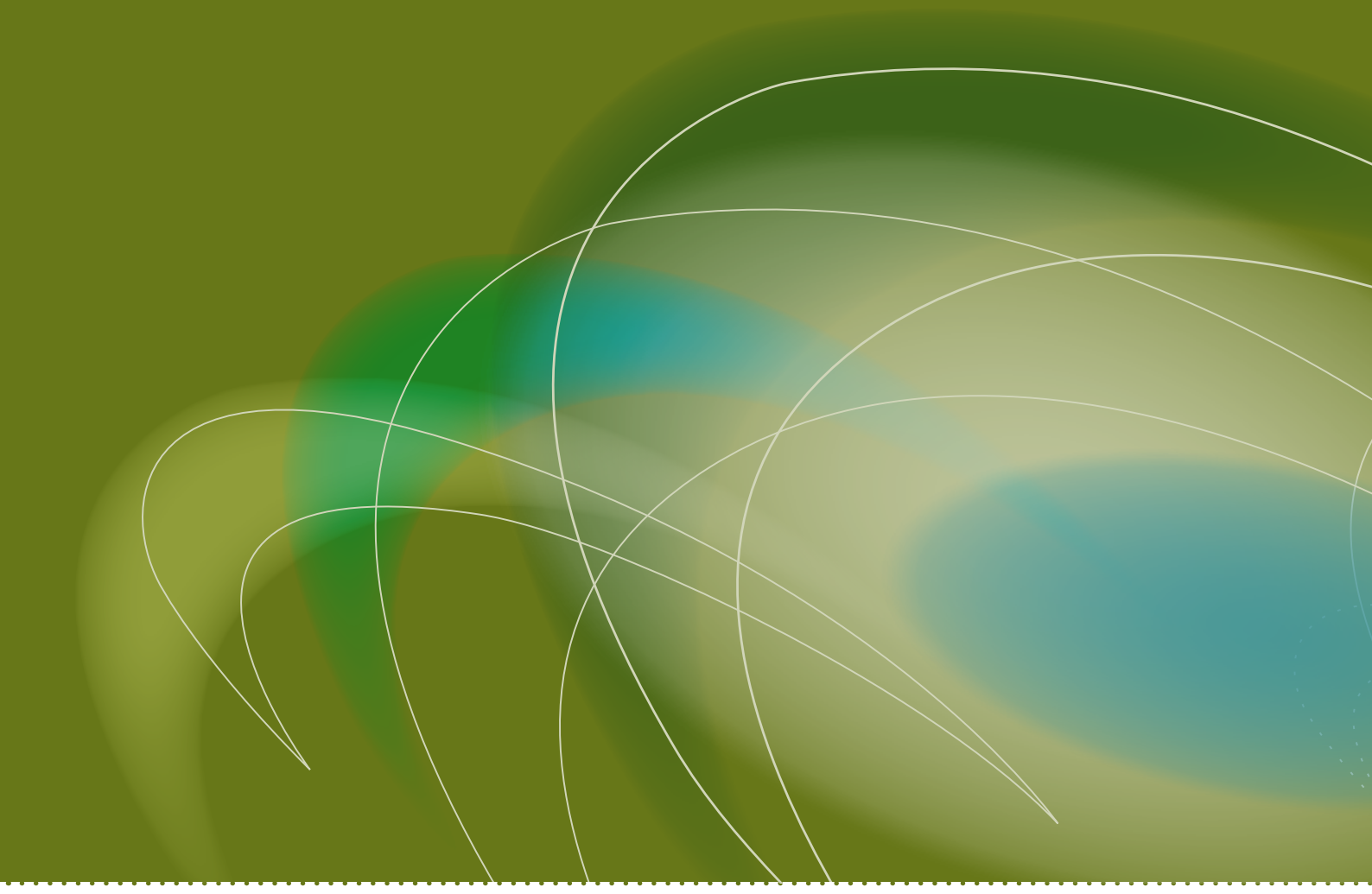
- the results of any monitoring undertaken
- any environmental incidents and if deemed necessary subsequent investigations and remediation plans
- DIA's progress in achieving the objectives and targets of the AES.

SECTION 3

Environmental Management Framework

3

- Darwin International Airport has established key objectives to guide environmental management at the airport.
- DIA is guided by a corporate framework that emphasises continual improvement in all airport management policies and programs.
- DIA is committed to the continual implementation and improvement of a comprehensive Environmental Management System and maintains an Environmental Site Register.



SECTION 3

Environmental Management Framework

3.1. ENVIRONMENTAL MANAGEMENT OBJECTIVES

Darwin International Airport (DIA) has established key objectives to guide environmental management at the airport:

- Maintain and continually improve a compliant and fit for purpose Environmental Management System (EMS) that is aligned to the international standard ISO 14001:2015 (see Figure 2 for framework)
- Maintain systems that identify and monitor any changes to legal and other requirements that apply to DIA in relation to the environment
- Identification of environmental aspects and assessment of risks ensuring all environmental risks are managed to a level of As Low As Reasonably Practicable (ALARP)
- Define clear accountabilities and conduct training for staff and contractors (new and existing) to achieve the objectives of the EMS
- Implement environmental assurance programs of the EMS to ensure its continuing suitability, effectiveness and compliance with objectives
- DIA's intention is to operate an airport business that is world class in achieving and maintaining financial and environmental sustainability, customer service, safety and security, and is recognised as a key contributor and participant in the economic growth of the NT.

3.2. DIA ENVIRONMENT AND SUSTAINABILITY POLICIES

DIA's parent company is the Airport Development Group, which owns 100 per cent of Northern Territory Airports Pty Ltd (NTAPL). NTAPL in turn owns all of Darwin International Airport Pty Ltd (DIA) and Alice Springs Airport Pty Ltd, which hold leases over Darwin International Airport and Alice Springs Airport (refer Figure 3).

The Airport Development Group Sustainability Policy and NTAPL Environment Policy represent a formal undertaking to give due consideration to the potential environmental impacts of all aspects of DIA's activities and operations. The Sustainability Policy is referred to when setting and reviewing environmental objectives and targets for DIA. The NTAPL Environment Policy (refer Figure 4) is seen as the foundation of DIA's EMS and AES, and guides the implementation of both. It undergoes thorough internal consultation and is communicated, implemented and maintained across all areas of the organisation. All employees and agents are responsible for understanding and having knowledge of the Environment Policy. Both policies will be subject to change from time to time.

FIGURE 2: STRUCTURAL FRAMEWORK AND RELATIONSHIPS BETWEEN DIA'S EMS REGULATORY REPORTING

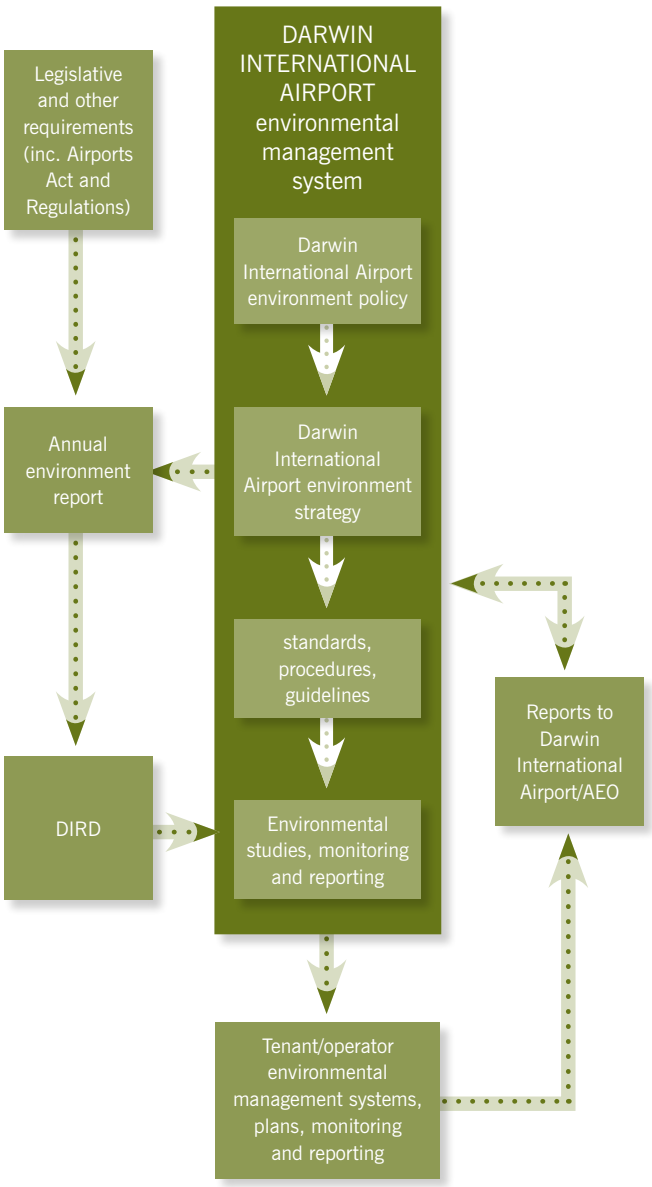


FIGURE 3: COMPANY STRUCTURE

3.3. ENVIRONMENTAL MANAGEMENT SYSTEM

DIA is committed to the implementation and continual improvement of a comprehensive Environmental Management System (EMS). In accordance with the Regulations the EMS is required to maintain consistency with relevant Australian and International standards. The ISO 14001 standard is now in a period of transition from the 2004 standard to 2015. DIA will implement a program to review its current EMS and aim to transition to the new standard by late 2018.

DIA's EMS comprises the following main components:

- Environment policy
- Planning – including environmental aspect and risk identification and assessment, development of standards, procedures and guidelines
- Implementation and operation – including environmental responsibilities, training and awareness, communication, document and operational control, and emergency preparedness and response
- Checking – including monitoring, assessment and auditing
- Management review - provides a health check of the system itself and look for areas to improve

NTAPL adopts the international standards approach of continual improvement through the Plan Do Check Act cycle. This promotes the review of current procedures and programs and identify areas for improvement.

The EMS applies to environmental aspects that the organisation can control and over which it can be expected to have an influence. The EMS takes into account relevant legislation, regulations, codes of practice and standards that relate to DIA's activities.

FIGURE 4: NTAPL ENVIRONMENT POLICY

ENVIRONMENT POLICY

Our Belief

Northern Territory Airports Pty Ltd (NTAPL) recognises the importance of maintaining and enhancing the quality of the environment for the benefit of all Australians, present and future. We seek to incorporate sustainability principles in all that we do.

We strive to be valued corporate citizens in our communities. We respect the values and cultural heritage of the local people.

Our Commitment

We are committed to the highest standards in our environmental management and will strive for continual improvement in our environmental performance.

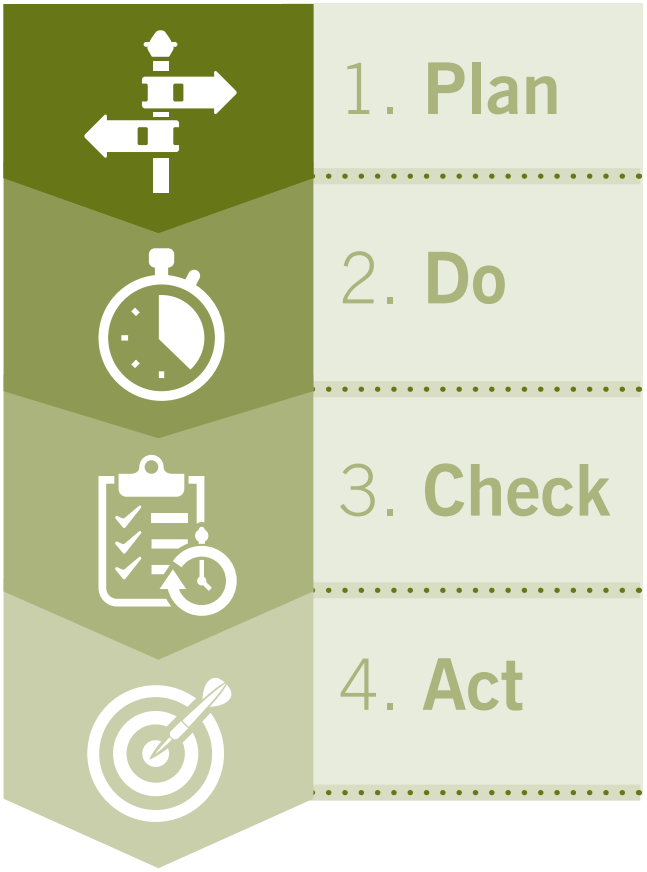
Our Actions

In order to meet our commitments, we will:

- Strive to minimise impacts on the environment including pollution of soil, air, water and protect biodiversity.
- Operate Management Systems that strive for best practice in environment and sustainability.
- Develop and review measurable objectives, and targets that promote continual improvement of our environment performance.
- Seek to reduce the consumption of natural resources and the generation of waste.
- Ensure we comply with all our legislative obligations.
- Ensure environment roles and responsibilities are documented, clearly communicated, understood and accepted by all staff.
- Work in consultation with our business partners, regulators and our local communities.
- Ensure personnel and contractors have the necessary information, skills and supervision to meet regulatory and corporate requirements.
- Empower our people with quality training and resources, ensuring they are environment leaders within our business.
- Lead and encourage stakeholders to improve the environment, resources and communities in the regions in which we operate.
- Ensure that all staff and other people working for, or on behalf of the Northern Territory Airports, are aware of this policy.
- Make this policy publicly available.

We are all responsible for working towards achieving a sustainable environment. By embedding a comprehensive and responsible culture throughout our business, we will meet our environmental goals.

To ensure the fulfilment of these commitments, we will develop, implement and maintain management systems consistent with the Australian and International Standards (AS/NZS ISO 14001:2004 and AS/NZS ISO 9001:2008). We will review this policy statement regularly.



3.3.1. ENVIRONMENTAL MANAGEMENT TRAINING

DIA conducts an Environmental Management Training Program to ensure that operators and tenants, where appropriate, are educated in their responsibilities in relation to environmental aspects when conducting their activities and business at DIA. Educating individuals on environmental awareness is vital to the successful implementation of environmental management initiatives.

In particular, personnel are made aware of:

- The Sustainability and Environmental policies, environmental objectives, the AES and EMS, and their roles and accountabilities.
- The environmental aspects and risks associated with their operations and the relevant controls and that are implemented to manage these risks to As Low As Reasonably Practicable (ALARP).
- The environmental and economic benefits of improved performance.
- The potential consequences of deviating from acceptable procedures.

Role specific training may include:

- airport induction
- spill response and management
- wildlife hazard management
- hazardous substances and dangerous goods management
- project environmental risk
- change assessment processes

Key environmental management achievements since the 2009 AES include:

- Review and updated Staff Induction Package, including specific environmental elements.
- Review and updated DIA Environmental Management – An Information Handbook for Operators at the Airport.
- Reviewed and further developed Contractor Induction Program.

A five year action plan for environmental management at DIA is outlined in Table 2.

TABLE 2: FIVE YEAR ACTION PLAN FOR ENVIRONMENTAL MANAGEMENT

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Continue to maintain and improve DIA's Environmental Management System	Ongoing	Continual improvement in environmental management and compliance	DIRD Annual Environment Report
2	Review of DIA EMS Standards, Procedures and Guides	2017	Develop and improve environmental management at DIA	DIRD Annual Environment Report
3	Continue to undertake the Environmental Management Training Program with staff and contractors	Ongoing	Continual improvement in Environmental management and compliance	DIRD Annual Environment Report
4	Development of an EMS road map and implementation of the renovation plan	2017 - 2018	Appropriate management and control of environmental incidents	DIRD Annual Environment Report
5	Undertake an external audit of DIA's EMS, and develop an implementation plan for the recommendations of the audit	2018	Continual improvement in environmental management and compliance	DIRD Annual Environment Report

3.3.2. ENVIRONMENTAL ASPECTS AND RISKS

As part of DIA's approach to risk management, an integrated risk management framework had been implemented that systematically identifies and evaluates the key environmental risks affiliated with all airport operations.

In assessing the environmental risks, DIA will routinely undertake reviews to determine the key environmental aspects resulting from airport activities, products and services (see Section 4.0). From these reviews, the potential environmental impacts will be determined and initiatives outlined to minimise impacts and improve environmental performance. These will be integrated into the "Five Year Action Plans" outlined in each environmental aspect's respective section in the AES.

3.3.3. ENVIRONMENT SITE REGISTER

In accordance with the Regulations, DIA has developed and maintains an Environment Site Register (ESR), which is a written record of the environmental condition of the airport, environmental site assessment details, remedial plans, monitoring undertaken and general environmental management at the airport. DIA also has a Contaminated Sites Register (CSR). As part of ongoing strategy for continual improvement and a consistent approach to environmental management, DIA plans to consolidate the CSR into the ESR, thus becoming the single source of truth for this important information.

3.3.4. ENVIRONMENTALLY SIGNIFICANT AREAS

Comprehensive surveys by local ecologists and a number of environmental assessments in conjunction with ongoing project works have identified there are no environmentally significant areas protected under legislation within the DIA lease boundary. These surveys have identified seven threatened species (refer to Section 4.3 – Biodiversity). All species records from wildlife surveys are compiled within the Flora and Fauna registers for the airport.

Following consultation with indigenous traditional owners, the Larrakia people, and officers from NT Government DIA has been advised by the Aboriginal Areas Protection Authority (AAPA) that no 'recorded' Aboriginal Sacred sites appear on their register under the Northern Territory Aboriginal Sacred Sites Act 1989. The AAPA issued an Authority Certificate to DIA in 2004 over the total airport lease area for the staged development of commercial and aeronautical activities on the airport land.

There are no known heritage sites within the DIA lease boundary.

3.3.5. ENVIRONMENTAL MONITORING AND REPORTING

Under the Regulations, DIA is required to monitor flora and fauna, as well as the quality of air, water, soil and noise to ensure that airport operations do not lead to pollution or disturbances on local fauna and habitat.

Monitoring and measurement processes provide information to airport operators and tenants in relation to environmental performance. DIA's monitoring addresses the following areas:

- Environmental objectives and targets.
- Operations and activities that can have significant environmental impact.
- Compliance with applicable environmental legislation and regulations.
- Environmental management measures employed by airport operators and tenants to ensure that they are appropriate.

Data is collected and analysed by appropriately qualified staff or contractors. All data forms part of the ESR. Monitoring locations, frequencies, procedures and parameters are reviewed annually and may change in response to local conditions or monitoring program reviews (Table 3). Any change is undertaken in consultation with the AEO.

TABLE 3: ENVIRONMENTAL MONITORING PROGRAM

ASPECT	PARAMETER/S MONITORED	FREQUENCY
Water Management (Potable Water)	Analytes against the Australian Drinking Water Guidelines (NHMRC 2011) and Schedule 2 of the Regulations	Annual water sampling. Three monthly chlorine and field parameters
Water Management (Surface Water)	Heavy metals and analytes against Schedule 2 of the Regulations	Four times per year
Water Management (Groundwater)	Heavy metals and analytes against Schedule 2 of the Regulations	Annually
Water Management & Waste and Resource Management (Trade Waste)	Trade waste parameters as specified in the Power and Water Corporation Trade Waste Agreement (TWA) for DIA	As per TWA agreement with PWC
Soil and Land Management (Contaminated Sites)	Soil requirements outlined in the Regulations	As required
Noise (Ground Noise)	Audit and reporting of ground running activities and noise measurements	As required
Hazardous Substances and Dangerous Goods	Use, type stored and storage facilities	Annually for DIA operations
Hazardous Substances and Dangerous Goods (Underground Storage Tanks)	Product loss, integrity	Weekly level testing, 5 to 10 year integrity tests
Hazardous Substances and Dangerous Goods (Asbestos)	'Asbestos Code of Practice and Guidance Notes', Worksafe Australia or NT legislation	As per NT Worksafe and at least every five years
Waste and Resource Management	Reporting on total waste generated	Monthly
Sustainability Energy and Resource Management	Energy and water consumed	Monthly
Biodiversity and Conservation Management (Weed Management)	Utilising a selection or combination of treatments such as slashing, mulching, herbicide application and fire	Annually
Biodiversity and Conservation Management (Flora and Fauna)	As per established guidelines for biodiversity assessment in the NT	5-yearly / AES aligned
Biodiversity and Conservation Management (Wildlife Hazard Management)	Identification of strike risk species to determine if disturbance/ removal actions are required.	Daily on the airfield. Off airport assessment – quarterly
Biodiversity and Conservation Management (Mosquitoes)	Requirements under NT Health Legislation and in accordance with Principal Stakeholder MOU for Mosquito Vector Management	As required
Environmental Management	Compliance with EMS, OEMPs or CEMPs in place within the DIA lease boundary	Weekly
Tenant and Contractor Management	Environment Assurance Program to monitor compliance with DIA's AES, EMS, CEMPs and OEMPs	Annual program risk based approach

SECTION 4

Environmental Aspects

4

- The environmental management aspects addressed in this AES include:
  - Water Management
  - Soil and Land Management
  - Biodiversity and Conservation Management
  - Air Quality and Emissions
  - Noise
  - Hazardous Substances and Dangerous Goods
  - Waste and Resource Management
  - Sustainability, Energy and Resource Management
  - Heritage
  - Development
  - Tenant and Contractor Management
  - Community

4.1 Water Management

OBJECTIVES

- Minimise impact on water quality as a result of Darwin International Airport operations.
- Maintain airport water quality within acceptable limits as defined by legislated standards.
- Continue to monitor and manage identified and suspected contaminated sites in accordance with regulatory requirements.
- Management of stormwater runoff from DIA to minimise the risk to the airport's neighbouring ecosystems.

4.1.1 BACKGROUND

The majority of the Darwin International Airport site falls within the Rapid Creek Catchment (Figure 5), with a small area in the northwest being part of the Ludmilla Creek Catchment. In addition to the airport, the Rapid Creek catchment includes the Marrara Sporting Complex, Marrara Golf Course, residential suburbs, Defence land, and part of the industrial area of Winnellie.

Rapid Creek and Ludmilla Creek drain into Darwin Harbour. Rapid Creek is of particular importance as its freshwater and downstream estuarine reaches support relatively healthy aquatic ecosystems. In addition, Rapid Creek is also highly valued by the community for recreation and has scenic and cultural values.

There are two sources of freshwater flows to Rapid Creek, stormwater runoff and groundwater. Groundwater from the airport predominantly flows northwards and drains into Rapid Creek, with a small proportion draining into Ludmilla Creek. During the dry season (May-September), base flows in Rapid Creek are sustained by groundwater seepage; predominantly fed by two springs located in the Marrara Swamp, which sits upstream on the neighbouring Defence estate. These base flows are essential in sustaining the aquatic ecosystems of Rapid Creek throughout the dry season.

The extreme seasonality of the Top End causes groundwater levels to fluctuate widely between wet and dry seasons. During the wet season, the water table rises rapidly to combine with surface water, generating sheet flows of up to 1.5m deep compared to the dry season where water levels may be as far as 8 metres below ground level).

4.1.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

Potential sources of impact to water quality at DIA include:

- re-fuelling facilities and fuel storage tanks
- waste oil and chemical storage areas in and around workshops, aircraft hangars and maintenance areas
- fuel, chemical or sewerage spills
- aircraft and vehicle wash-down areas
- waste, litter and sediment
- legacy contaminated sites

4.1.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

A number of current management practices are in place to ensure that significant and/or long-term surface or groundwater contamination does not occur. These practices include:

- 'Report All Spills' policy and spill response training
- Spill Response Procedure
- Maintaining an Environmental Sites Register
- Pollution control devices to intercept and treat stormwater runoff
- Utilisation of designated wash-down bays
- Interceptors to treat and test trade waste prior to entry into the Power and Water Corporation (PWC) sewer system in accordance with PWC's Trade Waste Agreement with DIA
- Comprehensive water quality monitoring programs

Water Quality Monitoring Program

DIA has continually developed and improved a comprehensive water quality monitoring program since the last AES. This program has included surface water, ground water, trade waste water, and potable water monitoring. Moving forward DIA will continue to improve and develop the way water quality is monitored. This will focus on how the reporting and analysis is done and how DIA can utilise the results of the monitoring program for environmental management initiatives.

Sampling sites target stormwater drains and sites along Rapid Creek that are representative of different discharge points throughout the airport catchment, and also a reference site that is upstream of the DIA catchment.

Through these improvements environmental monitoring and assessments of sites within the airport boundary and the application of the *National Environment Protection Measures* will lead to the development of a conceptual site model that will better inform decisions about managing any extant pollution. This will lead to, where required, the implementation of management actions through the design and carrying out of the water quality monitoring program.

A series of environmental monitoring bores are located around the DIA site, including around historic landfills, generator and airside refuelling facilities, and septic tanks, in addition to reference bores. Samples are analysed for potential environmental contaminants including dissolved metals, nutrients, hydrocarbons, and microbiological parameters.

In addition to the annual monitoring program, DIA recently engaged Charles Darwin University's Environmental Chemistry and Microbiology Unit to undertake two reviews of the airport's surface water:

- The first review assessed existing monitoring data from 2000-2016 for hydrocarbons in surface water from DIA and its surrounds located within the Rapid Creek catchment. Hydrocarbons are monitored at DIA due to the substantial storage and use of petroleum products and the potential for spills to impact the receiving waterways and ecosystem of Rapid Creek. The review concluded that no toxic impacts from hydrocarbons are expected to have occurred at the monitoring sites in the past 12 years.
- The second review involved the analysis of bacterial faecal indicators of surface water samples collected between 2009-2016 from eight sites along upper Rapid Creek. The analysis concluded that the faecal indicator levels were consistent with other creek sites in urban tropical environments.

The detection of per- and poly-fluorinated alkyl substances (PFAS) residue in groundwater and soil is an emerging issue at civil and Defence installations around Australia. PFAS are a group of man-made chemicals used in a variety of industrial and commercial products. They have been used as an active ingredient in fire-fighting foam used by the Department of

Defence and Airservices Australia at aerodromes around Australia. The substances have been listed as an emerging contaminant issue in recent years as they have been found to persist in the environment.

DIA continues to communicate with Department of Defence and Airservices Australia in relation to this matter, and an inter-government agency group led by the NT EPA has been established to provide a coordinated approach to PFAS investigations in the Northern Territory. DIA will continue to monitor this situation and work closely with the key stakeholders who have been doing extensive testing and monitoring themselves in quantifying the problems and dealing with these issues.

4.1.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 4: WATER MANAGEMENT KEY ACHIEVEMENTS 2009 - 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA	• Continued surface water monitoring program • Continued groundwater monitoring program • Commenced Trade Waste Monitoring Program • Maintained a Contaminated Sites Register
Tenants	• Commenced Compliance Program for Airport Tenants • Audited Pollution Control Devices • reviewed and updated DIA Environment Management – An Information Handbook for Operators at the Airport and Spill Management Handbook
Community	• Commenced community awareness sessions for discussing water quality in Rapid Creek • DIA driving force in the establishment of the Rapid Creek Water Advisory Committee in 2016 • Creation of a short film to educate passengers and community members about DIA's conservation of Rapid Creek.
Environment	• Commitment to undertaking a number of flood mitigation measures within the DIA lease area to assist in reducing flooding in Darwin's Northern suburbs and Rapid Creek area.

TABLE 5: FIVE YEAR ACTION PLAN FOR WATER MANAGEMENT

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Review and continual improvements to DIA's Water Quality Monitoring Program.	Ongoing	Improvement in understanding and management of water quality entering the catchment area	DIRD Annual Environment Report
2	Implement an Environmental Assurance Program and ensure ongoing facilitation	Commence 2017	Develop and improve environmental management at DIA	DIRD Annual Environment Report
3	Continue to monitor trade waste agreement discharge and maintain a register of Trade Waste Agreements	Annually	Maintain compliance with Power and Water Corporation Trade Waste Agreements	Power and Water Corporation
4	Development of a Water Quality Monitoring Guideline	Commence 2017	Develop and improve environmental management at DIA	DIRD Annual Environment Report
5	Development and endorsement of a Technical Standard for waste water treatment systems	2018	Develop and improve environmental management at DIA	DIRD Annual Environment Report
6	Ongoing commitment to implement flood mitigation works and stormwater management guidelines within DIA lease.	2018	Develop and improve environmental management at DIA	DIRD Annual Environment Report

FIGURE 5: RAPID CREEK CATCHMENT AND DIA LEASE BOUNDARY

4.2 Soil and Land Management

OBJECTIVES

- Employ land management practices which facilitate safe and sustainable DIA operations, whilst minimising detrimental effects on the environment, neighbouring land and the atmosphere ensure that existing contaminated sites are monitored and remediated where necessary.
- Undertake regular sampling and analysis to maintain soil quality at DIA in accordance with the *Airports (Environment Protection) Regulations 1997*

4.2.1 BACKGROUND

Land management at DIA is targeted towards preventing/ minimising soil erosion, sedimentation, contamination, airborne dust and wildfires. Management varies seasonally, for example wet season rainfall increases the risk of erosion and sedimentation, while the dry season presents airborne dust and fire management issues.

Land refers to the ground surface and soils, and landform features within the airport property. Land systems and land units covering the airport are described in the NT Government's *Land Systems of the Darwin Region*. The majority of airport land can be described as flat to gently undulating upland terrain with red massive soils, often deep and gravelly yellow massive earths, naturally vegetated (if uncleared) by Eucalyptus tall open forest or open forest. Closer to Rapid Creek, the terrain comprises gentle lower slopes and broad drainage floors and creek margins, subject to slow drainage, wet season water logging and/or inundation, vegetated by tall shrubland to low open woodland. The upper Rapid Creek is swampland with the majority of this area off the airport site lease.

Several small areas within DIA land were used as landfill sites for waste from the clean-up after Cyclone Tracy and also waste from airport development works conducted around 1991.

4.2.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

Potential sources that may lead to an environmental impact on land at the airport include:

- Poor implementation of Erosion Sediment Controls
- Fire (natural and prescribed regimes) creating bare soil more susceptible to erosion.
- Contamination through accidental spills or leaks, use of unapproved fill, septic tank leaks and legacy issues.
- Incorrect disposal of waste materials.
- Land clearing activities for development, weed control or landscaping.

4.2.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

Soil Erosion

DIA has implemented a range of measures to manage soil erosion, including:

- Capital works to improve the condition of any unlined drains.
- Implementation of Erosion Sediment Control measures for minor projects, construction / land clearing activities.
- Implementation of Erosion and Sediment Control Plans (ESCP) for major or high risk projects, required to form part of a Construction Environment Management Plan (CEMP).
- Monitoring of erosion within stormwater drains to inform management for remedial works if necessary.
- Retention and capture of stormwater.

Fire Management

There are several vegetation types within DIA that are prone to fire. In the past, DIA has implemented a two-stage, seasonal and area-specific burning strategy incorporating wet season burning and early dry season buffer and protection burns. However, this strategy must consider at all times potential impacts associated with smoke interference and aircraft visibility issues, increased risk of bird strike due to attracting foraging birds such as kites, as well as smoke in an urban environment. In addition to this, ongoing development activities on airport will continue to change the landscape and therefore likely reduce the need for prescribed burn programmes.

Contaminated Land

All known details of potentially contaminated sites such as historic landfills and areas where fuels or chemicals have been used or spilled/leaked as the result of an environmental incident are recorded in the DIA Contaminated Sites Register (Environmental Site Register). All sites presently recorded in this register have been assessed as remediated, contained, or listed for ongoing monitoring. Any new contaminated sites previously unrecognised or arising from new environment incidents or newly discovered contamination will be recorded in the register along with the management, containment measures and investigation undertaken to prevent environmental impacts. This will include a review of the current Contaminated Sites Register and relevant actions which will then be transitioned to the Environmental Site Register. These actions, along with any new additions to this register, will be monitored and reviewed periodically to record progress and reporting in the Annual Environment Report.

Role-specific training for DIA operators and tenants has been implemented to assist in the minimisation and management of contamination. This includes Environmental Management training and specific environmental incident spill response training.

4.2.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 6: SOIL AND LAND MANAGEMENT KEY ACHIEVEMENTS 2009 - 2016

AREA OF WORK	KEY ACHIEVEMENTS
Underground Petroleum Storage Systems (UPSS)	• Decommissioning of Underground Petroleum Storage Systems sites
Contaminated Sites	• Developed an Asbestos Management Plan and Register • Maintained Contaminated Sites Register
DIA	• Ensured appropriate sediment and erosion control measures were implemented during any development. • Fire Hazard Reduction Plan implemented
Environment	• Revegetation of erosion prone areas and buffer zone implemented in Rapid Creek
Environment Management System	• Development of environmental management and spill response handbooks for airport users • Development of a standard operating procedure for hazard reduction fires

TABLE 7: SOIL AND LAND MANAGEMENT FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Continue implementation of Erosion Sediment Control measures when undertaking construction activities within DIA lease boundary	Ongoing	Develop and improve environmental management at DIA	DIRD Annual Environment Report
2	Continued investigations into potentially contaminated sites and remediation measures with key stakeholders	Ongoing	Awareness of the extent of contamination and implementation of appropriate management plans	DIRD Annual Environment Report
3	Consolidate the current contaminated site register into and overarching Environmental Site Register and continue to review and update to ensure best management practices in alignment with industry standards	Ongoing	Awareness of the extent of contamination and implementation of appropriate management plans	DIRD Annual Environment Report
4	Implement an Environmental Assurance Program and ensure ongoing facilitation	Commence 2017	Develop and improve environmental management at DIA	DIRD Annual Environment Report

4.3 Biodiversity and Conservation Management

OBJECTIVES

- Maintain and protect listed environmental values onsite in accordance with relevant legislation.
- Continue regular biodiversity monitoring to enhance sustainability of all fauna and flora located within DIA lease boundary.
- Continue to implement the Wildlife Hazard Management Plan (WHMP) and minimise habitat for selected species to minimise the potential risk to aircraft safety.

4.3.1 BACKGROUND

The Darwin International Airport (DIA) site encompasses many near intact native vegetation communities that have relatively good habitat condition. The majority of vegetation communities are regrowth aged less than 25-35 years old. Historical vegetation clearance, fire, and weed infestations have affected the integrity of these communities. However, the nature of the wet/dry tropics enables many vegetation communities to regenerate naturally.

Approximately three-quarters of the airport site is comprised of cleared grassland associated with the buildings and airfield systems. The remainder of surrounding vegetation communities include remnants of Eucalypt woodland and part of the Rapid Creek riverine corridor.

DIA undertakes a variety of biological surveys at the airport site, with many relating to site-specific projects. The DIA Flora and Fauna registers indicates there is a relatively consistent diversity of species (flora and fauna) between surveys. To date, 307 flora species and 210 fauna species have been identified within airport grounds.

There are 12 distinct vegetation communities (refer Figure 4). Seven of these are native vegetation communities and the remaining are modified areas resulted from clearing, slashing and replanting. In general, across the site, the distribution pattern of native vegetation is highly dependent on landform and soil moisture content.

Seven threatened species have been recorded at DIA (refer Table 8). Two of these, the Darwin Cycad and the Black-footed Tree-rat, were recorded during the 2013/14 survey.

TABLE 8: THREATENED SPECIES RECORDED AT DIA

	COMMON NAME	SCIENTIFIC NAME	STATUS
Flora	Darwin Cycad	*Cycas armstrongii*	VU
Fauna	Northern Quoll	*Dasyurus hallucatus*	CR*†
	Floodplain Monitor	*Varanus panoptes*	VU
	Mitchell's Water Monitor	*Varanus mitchelli*	VU
	Black-footed Tree-rat	*Mesembriomys gouldii*	VU
	Pale Field Rat	*Rattus tunneyi*	VU
	Curlew Sandpiper	*Calidris ferruginea*	VU

Status key (TPWC Act):
VU – Vulnerable; CR – Critically Endangered;
* Listed as Endangered under the EPBC Act (1999)
† No recorded sightings at DIA, only NT Fauna Atlas sightings in the Darwin area, the last of which was in 1996.

Forty-two introduced flora species are known to occur within DIA, of which 12 are declared weeds under the Weed Management Act. Of the weed species, introduced grasses such as Gamba Grass, Mission Grass and Thatch Grass generally have significantly higher biomass than native species, cure later in the dry season and therefore promote hot fires.

Three introduced fauna species have been recorded during surveys at DIA, including the Cane Toad *(Rhinella marina)*, Asian House Gecko *(Hemidactylus frenatus)*, and Black Rat *(Rattus rattus)*.

4.3.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

Airport activities that may impact upon flora and fauna include:

- Clearing of vegetation for development and to comply with obstacle limitation surface restrictions and air traffic control line of sight.
- Fire, including wildfire and prescribed burns.
- Fuel or chemical spills.
- Weed control activities (including patch burning and herbicide use).
- Aircraft noise and accidents.

Flora and fauna that may pose an environmental, health, or safety risk include:

- Birds and other animal strikes.
- Pest animals including feral cats, rabbits, and mosquitoes.
- Invasive weeds.

4.3.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

Vegetation Management

Vegetation management measures for development proposals or land clearing activities implemented at DIA include:

- Compliance with relevant legislation in all land clearing/ development proposals and adhering to the *Land Clearing – leased Federal Airports Guidelines for Airport Lessee Companies*
- Requirement of Construction Environment Management Plans (CEMPs) for major development proposals.
- Implementation of DIA Landscaping Management Plan, requiring the preferential use of native species for revegetation and landscaping works.
- The establishment of vegetation reserves and regeneration programs across the airport site.

Pest and Pathogen Management

A range of measures are implemented to control pest animals at DIA. For example mosquitoes are managed by mapping of potential breeding sites, removal if possible, and monitored when necessary, in accordance with climatic conditions. Stormwater drains are maintained to minimise ponding where possible. Pesticide application occurs when necessary. The Federal Government Department of Agriculture and the NT Department of Health provides assistance with trapping and monitoring where necessary.

Weed management and monitoring programs are implemented across the DIA site and are conducted in conjunction with other environmental programs such as fire hazard reduction and regeneration works, to achieve an integrated approach.

Wildlife Hazard Management Plan

The risk of wildlife strike with aircraft at the airport is managed through implementation of the Wildlife Hazard Management Plan (WHMP). The main objective of the WHMP is to reduce bird and animal strike incidences, using both active and passive management to discourage birds and animals from utilising airside areas.

DIA recognises that wildlife hazard management requires a systematic approach, rather than focussing individually on wildlife species. Wildlife presence is influenced by available habitat, predators, water, food sources, inter/intra-species behaviour and human interaction.

Ongoing wildlife management activities undertaken by DIA include:

- Bird observations and incident of strikes, subsequently entered into a database.
- Bird and habitat identification training for Airport Operations Officers.
- Dispersal activities including, pyrotechnic bird fright, sirens, gunshot.
- Habitat modification, including maintaining optimal grass height adjacent to runways.
- Ongoing reporting and stakeholder meetings to review the implementation of the program.
- Program auditing.

Monitoring Programs

A variety of monitoring programs are undertaken to assess the condition of biodiversity and its threats within DIA. These are listed in Table 9.

TABLE 9: ECOLOGICAL MONITORING PROGRAMS AT DIA

MONITORING PROGRAM	FREQUENCY
Wildlife patrols (routine) and wildlife counts	Daily - ongoing
Bird monitoring (external consultant)	Quarterly
Weed monitoring (external consultant)	Annually
Biodiversity monitoring (external consultant)	Five yearly

4.3.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

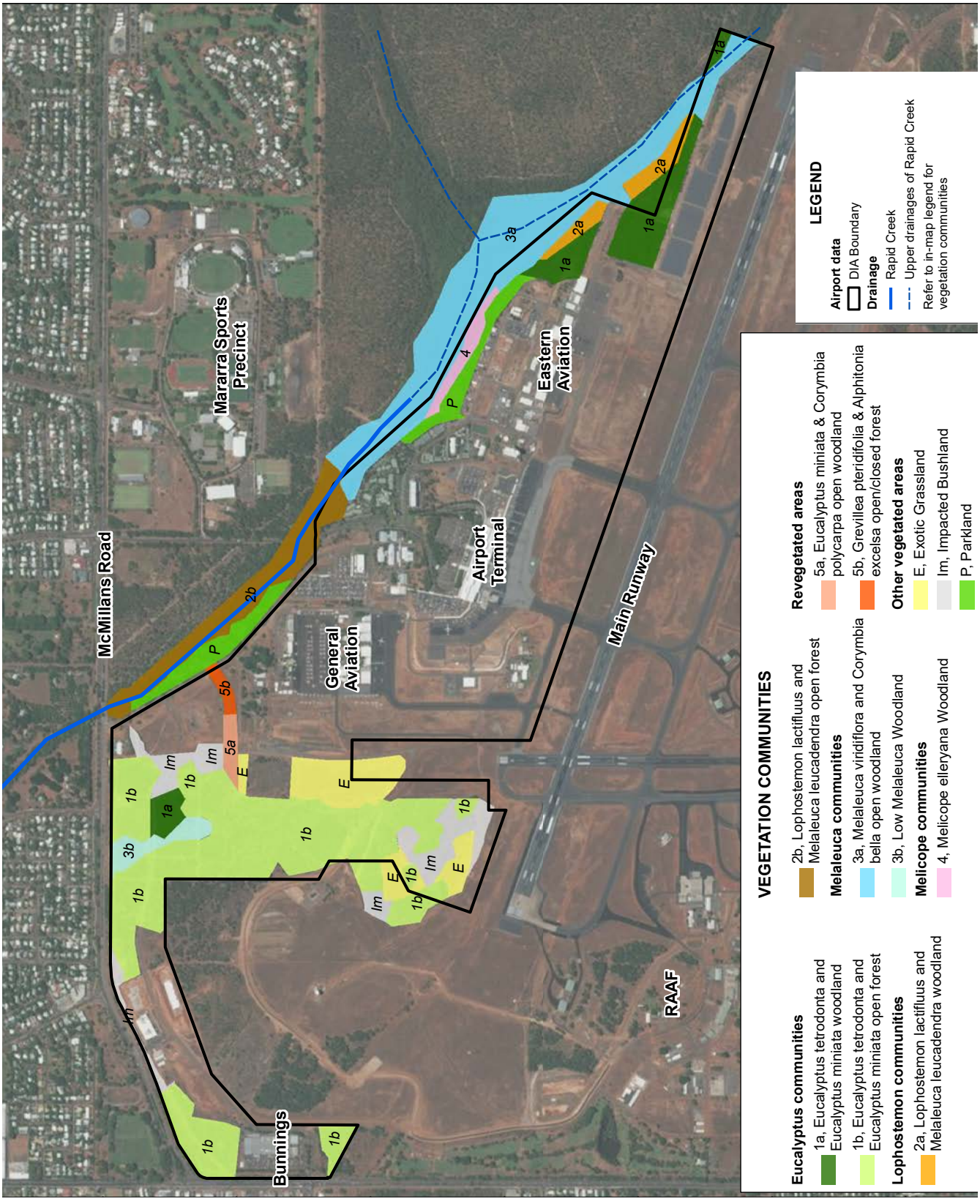
TABLE 10: BIODIVERSITY AND CONSERVATION MANAGEMENT KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
Biodiversity	• Continued implementation of weed management plan
Conservation	• Continued partnership with Greening Australia on the Conservation Reserve • Conducted the five-yearly flora and fauna survey within conservation areas (last conducted in 2013/14). • Completed fencing project of the Rapid Creek Reserve and implementation of a 75m wide buffer zone to help protect Rapid Creek, its wetlands and surrounding vegetation.
DIA Environmental Management	• Mapped Department of Agriculture (Biosecurity) mosquito monitoring locations at the airport and continued to implement monitoring and management measures. • Improved DIA Bird Identification Guide. • Updated Wildlife Hazard Management for DIA and RAAF Base Darwin • Development of the DIA Wildlife Species Strike Risk Calendar (for when high, moderate and potential wildlife risk species are present on airfield). • Continued to undertake off airport bird surveys for identification of potential bird attractors off airport. • Continued to provide Landscape Treatment Hierarchy (Master Plan) to operators, contractors and tenants during development at the Airport. • Reviewed and updated DIA Landscaping Guidelines Prohibited and Restricted Plant Species. • Continued weed management in accordance with the Fire and Weed Management Planning and the ESR.
Community	• Involvement in several 'Scientists in Schools' excursions where local ecologists provided students with information about the ecology of Rapid Creek and the surrounding woodlands.

TABLE 11: BIODIVERSITY AND CONSERVATION MANAGEMENT FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Continue and/or seek out partnership with external groups and organisations for conservation activities	Ongoing	Enhanced stakeholder engagement and consequent biodiversity outcomes	DIRD Annual Environment Report
2	Continue implementation and enhanced integration of Weed Management Plan and Fire Hazard Management Plan to reduce fire risk and weed infestation over time	Commence 2017	Appropriately manage airport land	DIRD Annual Environment Report
3	Investigate ways in which DIA's five yearly flora and fauna survey can be utilised in biodiversity and conservation management planning	Commence 2017	Improved biodiversity and conservation outcomes	DIRD Annual Environment Report
4	Review current management strategies for Rapid Creek and develop an appropriate 5 year management plan in conjunction with stakeholders	Commence 2018	Improved biodiversity and conservation outcomes	DIRD Annual Environment Report
5	Review and update Wildlife Hazard Management Plan (WHMP)	Annual minor review, 5 yearly major review	Appropriately manage airport land	DIRD Annual Environment Report
6	Review and update DIA landscape management documentation and associated guidelines of prohibited and restricted plant species	Commence mid 2017	Improved biodiversity and conservation outcomes	DIRD Annual Environment Report
7	Five-yearly Flora and Fauna Survey Assessment to be conducted	2019	Update on current status of flora and fauna populations and interactions at DIA	DIRD Annual Environment Report

FIGURE 6: MAP OF VEGETATION COMMUNITIES AT DIA



4.4 Air Quality and Emissions

OBJECTIVES

- Compliance with air quality standards as defined by Commonwealth and Northern Territory Regulations.
- Monitor and identify opportunities to minimise harmful air emissions from Darwin International Airport, particularly greenhouse gases and ozone depleting substances.

4.4.1 BACKGROUND

DIA experiences few issues with air quality or air pollution. Complaints relating to air pollution from airport operations are rare and are typically associated with one-off events such as bush fires, prescribed burns or Aviation Rescue Fire Fighting (ARFF) training exercises. The principle source of emissions at the airport is carbon dioxide related to energy use in buildings, transport and fixed plant.

DIA has engaged consultants and produced reports aligning with the reporting tool under the National Greenhouse and *Energy Reporting Act 2007*. To date, total air emissions produced have not exceeded the National Pollution Inventory trigger levels for any individual operation on airport, nor for the airport as a whole.

Solar Power

In August 2016, DIA commenced operation of a new 4MW photovoltaic (PV) solar array, adjacent to the eastern end of the main runway. This is the first of a two stage solar project. The Stage 1 facility comprises 15,000 solar panels over six hectares, and procures electricity equivalent to the consumption of 1,000 households.

Stage 2, comprising a smaller array positioned to the north of Runway 18/36 was commissioned in early 2017 and will provide a further 1.5MW of power to the airport.

The power generated by the system is entirely used within the airport site, and is forecast to meet up to 100% of the airport's peak energy demand in the middle of the day, and to generate 25% of the airport's overall energy needs.

4.4.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

Under the Regulations, air pollution may be from stationary or other ground based sources, including:

- Emissions generated by auxiliary and ground power units.
- Boilers, turbines, electrical generators and incinerators.
- Fuel burning equipment.
- Evaporation of Volatile Organic Compounds (VOCs) from large storage tanks.
- Oil or gas fired plant equipment.
- Construction activities.
- Ground based operations generating dust or smoke (including dark smoke emissions from hot fire training).
- Ground based aircraft movements.
- Refuelling, de-fuelling and evaporation of VOCs from spillage.
- Painting and paint stripping operations.
- Cleaning operations using solvents.
- Potential use of Ozone Depleting Substances (ODSs).

4.4.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

Air quality monitoring is conducted by qualified consultants periodically and when required.

Dark smoke emissions are a result of fire training which is undertaken by Airservices Australia Aviation Rescue Fire Fighting. The impact is managed by limiting fire training exercises outside of the hours of major aircraft activity and informing the AEO and DIA Environment Manager before fires are lit, through the Prescribed Burn Notification process.

Air quality issues occurring due to dust generation are managed through control measures implemented as a part of Construction Environmental Management Plans (CEMP) for development projects.

Moving forward, DIA will investigate options to quantify and assess trends in emissions to air from the airport and its activities. This work will be integrated with quantification of energy and resource use for DIA and its tenants. It is envisaged that strategies and plans will be developed through this work to implement measures that will aim to reduce harmful emissions to air.

4.4.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 12: AIR QUALITY AND EMISSIONS KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA	• Construction of two solar PV arrays, with a total output of 5.5MW. • Participation by DIA and other airport-based business employees in 'Ride 2 Work Day'. • Developed National Gas and Energy Reporting System for corporate greenhouse emissions monitoring. • Continued to undertake air quality monitoring and reporting as required. • Development of an Asbestos Management Plan and Register. • Completed Greenhouse Challenge Plus Program.

TABLE 13: AIR QUALITY AND EMISSIONS FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Review of energy and resource usage at DIA and investigate concepts and technologies that will promote energy efficiency	Commence 2018	Increased energy efficiency and cost savings	DIRD Annual Environment Report
2	Monitor air quality under the National Gas and Energy Reporting guidelines or similar guidelines	Ongoing	Continued trending and understanding of emissions to atmosphere as a result of business operations	DIRD Annual Environment Report
3	Continue to maintain the Asbestos Register for the airport	Ongoing	Understanding and management of risks in relation to working with asbestos and asbestos containing environments	DIRD Annual Environment Report
4	Investigate further renewable energy opportunities for power generation on airport	2017	Increased energy efficiency and cost savings	DIRD Annual Environment Report
5	Continue to participate in community environmental awareness programs such as 'National Ride to Work Day'	Ongoing	Raising of awareness of environmental airport issues.	DIRD Annual Environment Report
6	Investigate and consider the adoption of emissions offsetting programs	Commence 2018	Reducing environmental impacts by providing offsets	DIRD Annual Environment Report
7	Review of HSDG Register (including ODSs)	Commence 2017	Understanding of types and quantities of HSDGs stored onsite	DIRD Annual Environment Report

4.5 Noise

OBJECTIVES

- Ensure management and mitigation measures are implemented so that noise and vibration levels from ground based noise emissions at DIA are reduced as much as practicable and/or are compliant with legislative and regulatory requirements.

4.5.1 BACKGROUND

Airports are typically high noise environments due to ground based and aeronautical noise. DIA has not had any serious noise related incidents in the past 5 years, and noise complaints generally arise as a result of military operations. Under the joint-user deed, the Department of Defence is responsible for producing the joint civil-military Australian Noise Exposure Forecast (ANEF) included in the 2017 Master Plan.

The ANEF is a set of contours showing future forecasted levels of exposure to noise for building control purposes, and is used in accordance with Australian Standard AS2021:2015 to guide land use planning and development consent decisions by the relevant authority.

ANEF inputs include aircraft movement forecasts, runway and flight path usage, time of day and fleet mix. The 2042 ANEF assumes that there is to be no major changes to the airfield layout, any runway extensions or changes to the current flight patterns within the planning period. The current procedures for aircraft arriving and departing the airport were defined in close consultation with air traffic control.

The *Airports (Environment Protection) Regulations 1997* address noise generated from ground based activities. The *Airservices Act 1995* addresses noise generated by aircraft in flight, landing, taking off or taxiing. The AES does not address these stages of operation.

4.5.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

Ground based aviation noise:

- aircraft ground running
- aircraft maintenance and testing
- aircraft auxiliary power units
- aircraft refuelling and operation activities
- pavement maintenance.

Ground based non-aviation noise:

- tenant activities
- road traffic
- construction and demolition activities.

4.5.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

DIA will investigate noise complaints relating to ground based operations by way of response to the complainant. Responses will include an explanation for the event once identified and help identify issues of concern and opportunities for where we can make improvements. For non-ground based noise complaints DIA will refer complainants to Airservices Australia. All noise complaints received relating to ground based operations are reported to the AEO as soon as practicable after the complaint is made, and are included in the Annual Environment Report.

In the event of major changes to airport operations or unprecedented increases in air traffic volume, noise monitoring is undertaken to ensure noise levels remain at non-nuisance levels. DIA also evaluates the potential for noise generated by airport operators to impact upon new developments, particularly residential developments. In the absence of noise complaints, qualitative noise monitoring continues to be conducted on an ongoing basis.

The DIA Engine Ground Running Management Plan (2011) is used as a guide for the positioning of aircraft to reduce the impact of aircraft noise on the surrounding areas.

Construction Environmental Management Plans (CEMP) address potential noise pollution issues associated with construction activities and are a control measure for noise exposure during development on airport.

4.5.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 14: NOISE ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA	• Continued noise monitoring program as required. • Liaised with Airservices Australia through meetings on noise complaints and reporting. • Timely investigation and response reporting on any complaints where required.

TABLE 15: NOISE FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Continue to investigate and respond to any complaints received.	As required	Minimising Impacts to surrounding neighbours and on airport tenants	DIRD Annual Environment Report
2	Continue to review the DIA Engine Ground Running Management Plan in relation to its operational effectiveness	Annual	Minimising Impacts to surrounding neighbours and on airport tenants	DIRD Annual Environment Report
3	When released make link to Webtrak (Airservices online aircraft monitoring tool) available on DIA website	Event based	Community awareness	DIRD Annual Environment Report
4	Review of contractor CEMPs to ensure potential ground based noise impacts are assessed.	As required	Improved Environmental Management	DIRD Annual Environment Report

4.6 Hazardous Substances and Dangerous Goods

OBJECTIVES

- That all hazardous substances and dangerous goods are stored, handled used and disposed of in a manner that minimises environmental risk.
- To implement strong environmental controls to ensure the prevention and if need be management of spills to minimise the risks to the surrounding environment.

4.6.1 BACKGROUND

As part of DIA operations, a number of Hazardous Substances and Dangerous Goods (HSDGs) are required to be stored and handled on site. The most significant use of HSDG on the DIA lease area is aviation fuel.

Other Types of HSDGs and other chemicals with the potential to contaminate water, soil and air are stored as a part of DIA operations and its tenants include:

- fuels, oils, coolant and lubricants
- pesticides and herbicides
- batteries and battery electrolytes
- paint and paint stripping products
- cleaning chemicals including acids and solvents
- waste water
- fire fighting foam and other chemicals
- fertilisers.

4.6.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

The potential sources of environmental impacts relating to HSDGs occur when there are uncontrolled releases to the environment. Spills if not prevented or managed properly do have the potential to cause impacts to the environment. These impacts can be in the form of contamination of soil, water or air. The impacts may also adversely affect flora, fauna and human health.

4.6.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

Environmental management measures that are currently in place focus on the use, storage and disposal of HSDGs at DIA. These include the management of sites or areas on DIA land that may be impacted on by HSDGs through past environmental incidents or historical uses.

When the use, storage or disposal of HSDGs is undertaken a number of key controls must be in place relevant to the type of HSDGs:

- appropriate storage containers/tanks and bunding and refuelling/refilling areas
- fit for purpose waste water treatment facilities where required
- spill kits.

All tenants are required to maintain a register of Safety Data Sheets for all chemicals used on-site. The DIA Environment Assurance Program currently under development will include this as part of tenant audits to ensure compliance with relevant standards and requirements.

DIA also maintains a Hazardous Materials Register for its own lease holdings, which covers all HSDGs used, stored and disposed of on site. An Asbestos Register is maintained for DIA buildings that have been found to contain asbestos. Inspections are conducted at these buildings in accordance with the National Code of Practice.

Any incidents involving the spill or leakage of HSDGs are required to be reported in accordance with DIA's Environmental Incident Response Procedures. All fuel storage tanks and hydrant systems are regularly inspected for leaks to ensure compliance with relevant legislation and standards. The majority of underground storage tanks at DIA have integrity monitoring systems installed to immediately detect leaks.

4.6.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 16: HAZARDOUS SUBSTANCES AND DANGEROUS GOODS KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA Environment Management	• Developed DIA Spill Management Preventing Stormwater Pollution handbook. • Reviewed and updated DIA Environment Management – An Information Handbook for Operators at the Airport. • Maintained register of tenants' Trade Waste Agreements. • Continued hazardous material storage inspection program. • Ongoing development of Hazardous Substances and Dangerous Goods Register. • Undertook tenant audits that included spill response capabilities, procedures, and an update of type and quantity of hazardous materials held on their premises. • Commenced inspections of pollution control devices with Power and Water Corporation.

TABLE 17: HAZARDOUS SUBSTANCES AND DANGEROUS GOODS FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Review Environment Incident Response procedures and Spill Response Guidelines	Commence 2017	Minimising Impacts to surrounding neighbours and on airport tenants	DIRD Annual Environment Report
2	Implement Environment Assurance Program and include HSDGs as a part of this program	Commence 2017	Increase compliance with EMS and minimisation of environmental risks	DIRD Annual Environment Report
3	Review HSDG Register	Commence 2017	Up to date relevant information for operational personnel	DIRD Annual Environment Report

4.7 Waste and Resource Management

OBJECTIVES

- Minimise waste generation and increase efficiency in waste stream management across all airport operations, ensuring recycling and reuse of waste is implemented wherever practical.
- Ensure wastes are properly stored, transported and disposed.

4.7.1 BACKGROUND

Waste types generated at Darwin International Airport (DIA) can be defined as either solid, liquid, recyclable, hazardous or regulated waste.

- Solid waste includes office waste, food and packaging, green waste, construction and demolition waste.
- Liquid waste includes sewage effluent, industrial waste water and contaminated runoff water.
- Recyclable materials include paper, glass, plastic, and e-waste.
- Regulated waste oil, batteries, tyres, metal.
- Hazardous waste includes was which is regulated also includes quarantine waste, sanitary waste, asbestos, chemical storage containers, used chemicals, waste sludge and contaminated waste water.

Waste at DIA is handled by local waste contractors and general wastes are disposed of at the City of Darwin Shoal Bay Waste Disposal Site.

Waste water at the airport includes both sewage and trade waste which are sent to the Power and Water Corporation sewage system, while stormwater runoff discharges into Ludmilla Creek and Rapid Creek via pre-treatment devices where necessary.

4.7.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

Environmental impacts attributable to waste at DIA include:

- Incorrect disposal of solid waste by airport operators, contractors, tenants and users.
- Inappropriate storage of waste oils, chemicals, and other hazardous waste materials.
- Waste water runoff from airport operations such as paint stripping, fire training exercises, aircraft and vehicle wash down.
- Spills of HSDGs.
- Illegal dumping of waste on airport land.
- Inadequate pre-treatment of trade waste discharges to sewer.

4.7.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

Waste management at DIA is currently handled through a number of separate processes and services. DIA plans to investigate and develop a fit for purpose Waste Management standard, guideline and procedure for the airport to effectively plan and manage its waste streams more efficiently into the future.

Historically, the illegal dumping of waste on the airport site has been an issue. In particular, garden waste has been dumped along roads adjacent to the airport and litter along the length of Rapid Creek. The erection of signs and bins in areas of high public usage has resulted in a decrease in illegal dumping.

DIA participates in community events such as 'Clean Up Australia Day' to promote our proactive approach to waste management initiatives. Generally, the focus areas for the clean-ups are on the high public usage areas along the Rapid Creek riparian zone and on airport land.

Recycling is also implemented at the airport, in accordance with the capabilities of local recycling facilities.

The airport is connected to the Darwin town sewer and only one septic system remains on the airport. There are plans in place to connect this last property to sewer so there are no septic systems on line at the airport.

4.7.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 18: WASTE AND RESOURCE MANAGEMENT KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA Environment Management	• Monthly Waste Reporting received and reviewed • Construction Environmental Management Plans (CEMP) include sections which stipulate that to reduce and recycle waste where practicable on project sites. • Participation and awareness of Clean Up Australia Day

TABLE 19: WASTE AND RESOURCE MANAGEMENT FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Development of a Waste Management Strategy and Plan	Commence 2017	Improvements in overall waste management and reduction of waste at DIA	DIRD Annual Environment Report
2	Develop Environment by Design initiatives to be embedded in the project design phase including OPEX and CAPEX purchases	Commence mid 2017 and implementation 2018	Reduction in waste and whole of life approach in project designs	DIRD Annual Environment Report
3	Decommission remaining septic system and connect to reticulated sewer system	2017	Increased water quality management	DIRD Annual Environment Report
4	Review and continual improvements to DIA's Water Quality Monitoring Program.	Ongoing	Improvement in understanding and management of water quality entering the catchment area	DIRD Annual Environment Report
5	Take part in community activities such as Clean Up Australia Day	Annually	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report
6	Implementation of the Environment Assurance Program to include Hazardous Waste Removal	Commence 2017	Increase compliance with EMS and minimisation of environmental risks	DIRD Annual Environment Report
7	Monitor and put in place further controls if needed to manage illegal rubbish dumping on DIA land	Ongoing	Reduction of illegal dumping within airport lease boundary	DIRD Annual Environment Report

4.8 Sustainability, Energy and Resource Management

OBJECTIVES

- To ensure effective monitoring and measuring of DIA energy and resource usage.
- Continual improvement in the use of non-renewable resources providing long term sustainability across DIA operations.
- Increase energy and resource efficiency of ground based operations across the DIA lease area

4.8.1 BACKGROUND

Darwin International Airport (DIA) as with all large airports requires significant amounts of energy for providing the operations and services as required for an airport of its size. Likewise, energy costs account for a large percentage of the day to day running expenses of an airport. There are currently three main energy sources used at DIA including grid connected power, on-site emergency power (provided via diesel generators) and solar photovoltaic arrays located at DIA. Other energy use sources include the running of the vehicle fleet.

In August 2016, DIA commenced operation of a new 4MW photovoltaic (PV) solar array, adjacent to the eastern end of the main runway. This is the first of a two stage solar project. The Stage 1 facility comprises 15,000 solar panels over six hectares, and procures electricity equivalent to the consumption of 1,000 households. Stage 2, comprising a smaller array positioned to the north of runway 18/36 was commissioned in early 2017 and will provide a further 1.5MW of power to the airport. The power generated by the solar array system is entirely used within the airport site, and is forecast to meet up to 100% of the airport's peak energy demand in the middle of the day, and to generate 25% of the airport's overall energy needs.

The large capital investment into renewable energy and other projects looking to increase efficiency works at DIA are outstanding examples of DIA's commitment to long term sustainability of its operations. These initiatives provide ongoing efficiencies as the airport continues to develop while ensuring that is ecological footprint does not grow exponentially with such growth.

4.8.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

By effectively managing energy and resource usage, DIA can work towards building efficiencies into the development of the airport working towards long term goal of sustainability.

Resource usage and the majority of actual environmental impacts are incurred offsite at the point of energy production or water storage and supply points (e.g. underground aquifers).

The main sources of energy consumption at DIA include:

- General airport operations including all activities within airside and landside buildings within the DIA lease area
- Vehicle and ground based aircraft activities including operation of plant and equipment
- Lighting (including runway lighting, area lighting, street lighting and internal building lighting)
- Air traffic control tower operations
- air-conditioning, power use and conveyor belts within the terminal building and other buildings occupied by DIA staff, tenants and contractors
- Grounds maintenance and landscaping
- Construction projects and related works

Airport activities using significant volumes of water include:

- aircraft and vehicle washdown
- fire training activities
- water usage by airport customers
- landscape garden maintenance.

In addition to energy usage, waste in landfill is also a source of greenhouse gas emissions.

4.8.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

DIA's environmental management response to providing a sustainable and energy efficient airport includes the following plans, strategies and initiatives:

- Construction of two solar photovoltaic arrays
- Working towards "Environment by Design" as a standard practice
- Implementation of water and energy saving initiatives

DIA has installed power factor corrections equipment in the airport power distribution network to reduce energy consumption across the airport. A number of direct actions have been implemented including a review of airfield lighting and plant and equipment. Energy data is collected and reported on a monthly basis to track DIA's progress in improving energy efficiency.

All new airport developments will be encouraged to incorporate energy and water efficient design. All new and existing buildings and infrastructure are currently designed and constructed to accommodate the required cyclone codes.

4.8.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 20: SUSTAINABILITY, ENERGY AND RESOURCE MANAGEMENT KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA Environment Management and Monitoring	• Continual expansion and development of electrical metering strategy.
Energy Efficiency Initiatives	• Installation of a CO_2 monitoring system that allows the terminal air conditioning system to respond to area occupancy. • Expansion of the Building Management System (BMS) to assist in the management of water and power reduction. • Installation of ten large-scale fans within the terminal building, assisting in air circulation and reducing the terminal's dependence on air conditioning. • Development of Energy Efficiency Plan • Construction of two solar PV arrays, with a total output of 5.5MW. • Creation of a short film to educate passengers and community members about DIA's solar array developments. • Investigation of water saving initiatives • LED lighting replacements in the terminal • Solar powered obstacle beacons
Recognition	• Airport Innovation and Excellence Award for Environmental Management at the Australian Airports Association industry awards in November 2016

TABLE 21: SUSTAINABILITY, ENERGY AND RESOURCE MANAGEMENT FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Incorporate "Environment by Design" into new projects and retro fitting of current infrastructure	Commence 2017	Improved efficiencies and management of energy and resources	DIRD Annual Environment Report
2	Investigate the development of an Energy and Resource Management Plan to consider further long term initiatives to improve efficiencies	Commence mid 2017	Reduction in base energy and resource loads	DIRD Annual Environment Report
3	Implementation of the Environmental Assurance Program to include energy and resource management recommendations	Commence 2017	Improved efficiencies and management of energy and resources	DIRD Annual Environment Report
4	Continue to investigate Solar Photovoltaic Array development opportunities	Ongoing	Improved efficiencies and management of energy and resources	DIRD Annual Environment Report
5	Investigate and consider the adoption of emissions offsetting programs	Commence 2018	Reducing environmental impacts by providing offsets	DIRD Annual Environment Report
6	Investigate and apply for the Airports Carbon Accreditation scheme	Commence 2017	Third party recognition of improved efficiencies and management of energy and resources	DIRD Annual Environment Report

4.9 Heritage

OBJECTIVES

- To identify, understand, preserve and manage sites of indigenous and non-indigenous heritage value in accordance with legislative requirements and in consultation key stakeholders.

4.9.1 BACKGROUND

Darwin International Airport (DIA) has been advised by the Aboriginal Areas Protection Authority that no 'recorded' Aboriginal Sacred Sites appear on their register under the Aboriginal Sacred Sites Act 1989.

The land on which the airport is located was bombed during World War II and the majority of infrastructure was devastated during Cyclone Tracy in December 1974. The majority of the older buildings relating to the historical use of the airport are located within the RAAF lease area. No listed European heritage sites have been identified within the DIA lease area.

4.9.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

As there are no 'recorded' sacred sites and limited non indigenous heritage values located at DIA, impacts upon heritage values are unlikely. However during the development and maintenance of the airport, failure to identify or accidental disturbance could cause impacts to heritage values.

4.9.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

Activities that could potentially impact upon heritage such as construction or development on airport land go through an assessment process to minimise this risk. CEMPs are utilised where heritage values may exist for all projects and all contractors are required to be aware of this document and their obligations while working on site.

If items of heritage value are uncovered onsite, the find is to be immediately reported to DIA's Environment Manager and appropriate management measures implemented.

DIA strives to foster good working relationships with the Larrakia people and has undertaken joint projects in regards to the cultural protection of Rapid Creek.

4.9.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 22: HERITAGE MANAGEMENT KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA Environment Management and Monitoring	• Ensured all contractors and tenants understood their heritage obligations under the 'Site Rules', Construction Environment Management Plans (CEMPs) and/or via the DIA Environment Management – An Information Handbook for Operators at the Airport
Community	• Continued to work with the Larrakia people in the management of Rapid Creek and other DIA projects • DIA hosted the cultural dance company 'Tracks Dance' and their production 'Landed' on the Gurambai Trail in the Rapid Creek reserve in 2016 as part of the Darwin Festival • Education through interpretative signage Gurambai Trail

TABLE 23: HERITAGE FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Continue to ensure all contractors manage their heritage obligations via inclusion in Construction Environment Management Plans (CEMPs) submitted to DIA	Ongoing	Improvement of risk controls to protect heritage values	DIRD Annual Environment Report
2	Implementation of the Environment Assurance Program and raising awareness of heritage values	Commence 2017	Improvements in environmental management	DIRD Annual Environment Report
3	Promote cultural events in the Rapid Creek Reserve	Ongoing	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report
4	Continue to work with the Larrakia people in the management of Rapid Creek Reserve and other DIA projects	Ongoing	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report

4.10 Development

OBJECTIVES

- Strive to set a high standard at the airport in adopting ecological sustainable development standards and working towards embedding "Environment by Design" principles in the development of services and facilities.
- Aim for all new buildings and developments to be assessed under the National Australian Built Environment Rating System (NABERS) looking to achieve a 4.5 Star rating

4.10.1 BACKGROUND

It is necessary for Darwin International Airport (DIA) to continually develop in order to meet the increasing demands of travellers, the aviation industry and the surrounding region. DIA understands the importance of achieving a balance between development and the maintenance and enhancement of environment values. To be able to respond to future growth while effectively managing environmental impacts, the adoption of sustainable design, construction and operational principles is crucial. The major aspects include energy and resource management, and the impacts of construction management.

4.10.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

Development activities have the potential to impact upon each of the different environmental aspects addressed throughout this AES.

4.10.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

Environment by Design

The design and development of new buildings at DIA should aim to achieve a 4.5 star NABERS rating. NABERS is a national rating system that measures the environmental performance of Australian buildings, tenancies and homes. Put simply, NABERS measures the energy efficiency, water usage, waste management and indoor environment quality of a building or tenancy and its impact on the environment

To do this, DIA will embed sustainability requirements and objectives into its Environment Assessment process, including recommendations on the use of energy efficient technologies and methods to reduce waste reduction.

Construction Management

DIA requires that contractors performing major works, or works that are determined to have high environmental risk, prepare a Construction Environment Management Plan (CEMP). This plan must be reviewed and approved by the DIA Environment Manager before any works commence.

4.10.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 24: DEVELOPMENT KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA Environment Management and Monitoring	• Ensured DIA operators, tenants and contractors were appropriately inducted and trained. • Maintained and updated all relevant plans and strategies to ensure adherence to best practice by DIA operators, tenants and contractors. • Ensured all relevant plans and strategies are available to DIA operators, tenants and contractors. • Ensured new developments incorporated sustainability design, wherever feasible. • Encouraged tenants to use energy efficient building design and use of efficient technologies through the building and development approval process.

TABLE 25: DEVELOPMENT FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Continue to ensure all contractors submit Construction Environment Management Plans (CEMPs) and provide assurance against these.	Ongoing	Improvement in Environment Management of Project Management process	DIRD Annual Environment Report
2	Implementation of the Environment Assurance Program including projects and development	Commence 2017	Improvement in Environment Management of Project Management process	DIRD Annual Environment Report
3	Investigate and develop an 'Environment by Design' standard for DIA	Commence 2017	Incorporate into BAU project design and development ESD principles	DIRD Annual Environment Report
4	Ensure plans, strategies and information, inclusive of legislative provision, are available to DIA operators, tenants and contractors	Ongoing	Improvement in Environment Management of Project Management process	DIRD Annual Environment Report
5	Aim to achieve NABERS 4.5 Star rating in all new buildings and facilities developments	Ongoing	Third party recognition of improved efficiencies and management of energy and resources	DIRD Annual Environment Report
6	Development of the EMS will include a project specific environmental screening assessment	2018	Improvement in Environment Management of Project Management process	DIRD Annual Environment Report

4.11 Tenant and Contractor Management

OBJECTIVES

- To work in partnership with DIA tenants and contractors to ensure best environmental practice continues to be implemented in all airport operations.
- To assess the environmental risk profile of DIA tenants and categorise them relevant to this risk. Utilise contractors that have environmental certification and develop a list of these approved contractors.

4.11.1 BACKGROUND

The Darwin International Airport (DIA) lease area is home to a diverse range of businesses and operators. This includes businesses that are aviation related but also incorporates a number of commercial (non-aviation) entities that choose to base themselves within the DIA lease area. Lease terms and conditions incorporate environmental clauses to ensure all parties understand their obligations while operating on DIA land. DIA also employs a wide range of contractors who undertake a variety of services at DIA, for example construction and engineering works, maintenance works and landscape management. These contractors must complete an environmental induction before working within the DIA lease boundary.

4.11.2 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

Sources of environmental impact are generally related to the activities or services that a tenant or contractor is undertaking within the DIA lease area. Standard activities are assessed under DIA's Environmental Risk Assessment standard and managed to as low as reasonably practicable (ALARP) by ensuring that all relevant risk controls are effectively implemented.

4.11.3 ENVIRONMENTAL MANAGEMENT AND MONITORING

The Airport Environment Strategy sets up the parameters around which the airport-lessee company (ALC) and all of its operators (including all airport based businesses, tenants and contractors) are legally required to implement all practical measures outlined in the AES to minimise environmental impact within the DIA lease.

Tenants

Tenants and operators/contractors are assessed in relation to the level of environmental risk that can be attributed to the activities they undertake. Tenants/operators may be asked to develop and implement an Operational Environment Management Plan (OEMP) or equivalent (i.e. certified EMS) to address the specific activities undertaken by their business and the potential environmental impacts. DIA are implementing an Environment Tenant Assurance Program that will incorporate levels of surveillance depending on a tenant/operators/ contractors level of risk and historical operations, as per Table 26 and 27. This will ensure compliance with relevant regulations and DIA's EMS.

Coupled with the new Environmental Assurance Program, DIA will initiate an Environment Committee and provide environmental management awareness training to our tenants and contractors where necessary, to ensure understanding of accountabilities and obligations under the relevant legislation and AES.

Contractors

Contractors are required to complete environmental inductions prior to commencing work at DIA. All contractors will be made aware of any significant environmental risks in their area of work and relevant to the activities they are undertaking through the CEMP. All CEMPs for projects must be implemented by contractors and be made available for viewing at the project site.

TABLE 26: TENANT ENVIRONMENTAL RISK CATEGORIES

CATEGORY	DESCRIPTION
Class A	**High risk tenants** – activities such as, but not limited to, aircraft maintenance hangars, fuel storage and refuelling, significant hazardous substances and dangerous goods storage, and significant trade waste generation. All such activities have the potential to cause significant environmental damage
Class B	**Medium risk tenants** – activities such as ground service equipment maintenance, aircraft repair and maintenance workshops, and large warehousing facilities. All such activities have the potential to cause moderate environmental damage
Class C	**Low risk tenants** – activities include commercial retail, office/administrative and childcare facilities. These operations provide a low risk to the environment

TABLE 27: TENANT AUDITING AND REPORTING REQUIREMENTS

TYPE OF AUDITING	CLASS A	CLASS B	CLASS C
External audit*	Annual	N/A	N/A
DIA conducted assurance	Annual	Annual	DIA to manage
Tenant Annual Report	Annual	Annual	Annual

*For Class A tenants, DIA may accept internal audits as an external audit as agreed by DIA on a case by case basis. This will be assessed on a tenant's track record, internal environmental systems and procedures such as an EMS, and if the tenant has suitably qualified personnel internally to conduct the audit.

4.11.4 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 28: TENANT AND CONTRACTOR MANAGEMENT KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA Environment Management and Monitoring	• Ensured DIA operators, tenants and contractors were appropriately inducted and trained. • Maintained and updated all relevant plans and strategies to ensure adherence to best practice by DIA operators, tenants and contractors. • Ensured all relevant plans and strategies were available to DIA operators, tenants and contractors. • Reviewed and updated DIA Environment Management – An Information Handbook for Operators at the Airport. • Regularly updated and disseminated 'Touchdown' newsletter. • Developed DIA Spill Management Preventing Stormwater Pollution handbook. • Developed and rolled out first stage of Tenant Online Environment Survey.

TABLE 29: DEVELOPMENT FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Implementation of the Environment Assurance Program will include tenant and project site inspections	Commence 2017	Improvement in Environment Management of Project Management process	DIRD Annual Environment Report
2	Continue to ensure all contractors submit Construction Environment Management Plans (CEMPs) and provide assurance against these.	Ongoing	Improvement in Environment Management of Project Management process	DIRD Annual Environment Report
3	Create Terms of Reference and initiate DIA Environment Committee	Commence 2017	Improvement in Environment Management and Environment Awareness providing a forum for discussion and stakeholder engagement	DIRD Annual Environment Report
4	Update Contractor induction program	Commence 2017	Improvement in Environment Management and training of personnel	DIRD Annual Environment Report
5	Development of OEMP for tenants as required	As per recommendations from Environment Assurance Program	Improvement in environment management at specific sites that have high risk activities	DIRD Annual Environment Report
6	Update of Environment Information on DIA website	Annually	Improvement in communication of update to date information of tenants and contractors operating within the DIA lease boundary	DIRD Annual Environment Report

4.12 Community

OBJECTIVES

- To build community awareness of DIA's environmental programs and initiatives through promoting increased community involvement and fostering long lasting partnership with key community stakeholders

4.12.1 BACKGROUND

Darwin International Airport (DIA) is committed to proactively developing and maintaining strong links with the community and its key stakeholders, not only in regard to the AES but in the overall operation of the airport. DIA considers these community links a vital component in promoting awareness of the airports environmental values. As the gateway to our beautiful city, DIA feels a responsibility to show our many visitors that promotion and awareness of environmental values is of vital importance in the operation of the airport within the community. DIA provides the Northern Territory community with a vital health and social link, facilitating access to the rest of Australia and providing a base for essential services.

As part of an arts and cultural focused sponsorship program, DIA has supported 'Tracks Dance'. In 2016, DIA was proud to host the organisation's major production on site and with an aviation flavour. Titled *Landed*, the performance explored the experiences of three different characters arriving back home in Darwin after being away for some time. Set in the dry Marrara Swamp at the source of Rapid Creek, the audience followed the Gurambai Walking Trail as they enjoyed the vignettes of dance taking place in the bush. *Landed* was a full-length dance work embedded in the local landscape.

DIA is a member of a number of community based forums and committees such as the Community Consultation Group (CCG), and the newly reformed Rapid Creek Water Advisory Committee. DIA is also a sponsor of Northern Territory events such as the Territory Natural Resource Management Conference and the Darwin Festival amongst others. Through these links the airport can gain a broad perspective on how the public views DIA achievements and management practices.

4.12.2 ENVIRONMENTAL MANAGEMENT AND MONITORING

DIA fosters ongoing, positive working relationships with airport operators and tenants to ensure the objectives of the AES are met. DIA maintains support to the community through provision of sponsorship to a number of local clubs and sporting groups as well as remaining an active member of local industry and environmental organisations.

DIA acknowledges the significant contribution of the Larrakia people to the community of Darwin and continues to foster a positive relationship with the local indigenous community.

4.12.3 KEY ACHIEVEMENTS AND FIVE YEAR ACTION PLAN

TABLE 30: COMMUNITY KEY ACHIEVEMENTS 2009 – 2016

AREA OF WORK	KEY ACHIEVEMENTS
DIA Community Initiatives	• Ongoing liaison with local community and resident groups • DIA was a driving force in the establishment of the Rapid Creek Water Advisory Committee in 2016 • Continued involvement in Clean Up Australia Day and the Great Northern Clean Up. • Included environmental activities in the Corporate Giving Program, DIA's charitable donation program. • Facilitation of Community Consultation Group and ongoing interaction with the community members of this forum • Commissioned a bus shelter on airport, to assist passengers and public bus services. • DIA supported and hosted 'Tracks Dance' production 'Landed' in the Rapid Creek reserve on the Gurambai Walking Trail • Involvement in Scientist in Schools ecology projects. • Gurambai Walking Trail upgrade. • Creation of a series of short films to educate passengers and community members about DIA's environmental initiatives, including the conservation of Rapid Creek and the installation of new solar arrays. • Sponsored two Charles Darwin University students to attend the Territory Natural Resource Management Conference

TABLE 31: COMMUNITY FIVE YEAR ACTION PLAN

FIVE YEAR ACTION PLAN				
	MANAGEMENT ACTION	TIMEFRAME	EXPECTED OUTCOME	REPORTING
1	Ongoing liaison with local community/residents groups	Ongoing	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report
2	Continued involvement in Clean Up Australia Day and/or the Great Northern Clean Up and Earth Hour	Ongoing	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report
3	Update and maintain environmental information on the DIA website for community and partners	Annually	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report
4	Continue to facilitate the business of the Community Consultation Group	Ongoing	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report
5	Continue to publish environmental information in the Airport Development Group (ADG) Annual Report	Annually	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report
6	Look to make available the Rapid Creek Reserve for Community and Cultural events	As events are organised	Community engagement and building of relationships and environmental awareness	DIRD Annual Environment Report

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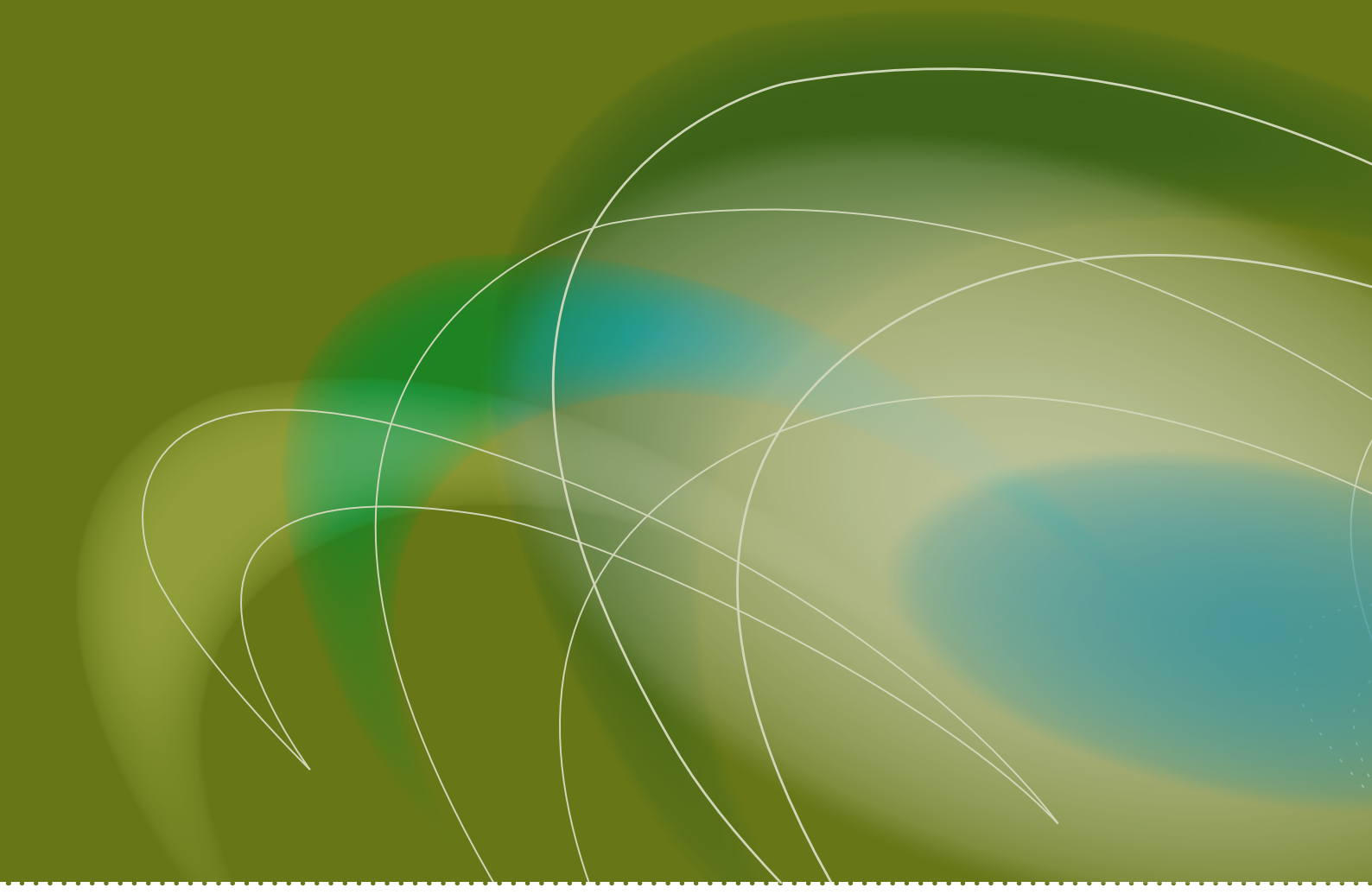
SECTION 5

Assessment as to Consistency with Regulations

5



SECTION 5

Assessment as to Consistency with Regulations

5.1 AES LEGISLATIVE REQUIREMENTS: *AIRPORTS ACT 1996*

TABLE 32: ASSESSMENT AS TO THE CONSISTENCY WITH THE *AIRPORTS ACT 1996* AND ASSOCIATED REGULATIONS

LEGISLATION	FINAL DETAILS IN SECTION OF THE AIRPORT ENVIRONMENT STRATEGY
AIRPORTS ACT 1996	
71 Contents of draft or final master plan (joint-user airports)	
(3) In the case of a joint-user airport, a draft or final master plan must specify:	
(a) an environment strategy that details:	
(i) the airport-lessee company's objectives for the environmental management of the airport; and	Sections 3.1 and 3.3
(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	Sections 3.3.4 and 4.3
(iii) the sources of environmental impact associated with civil aviation operations at the airport; and	Sections 3 to 4
(iv) the studies, reviews and monitoring to be carried out by the airport-lessee company in connection with the environmental impact associated with civil aviation operations at the airport; and	Sections 3 to 4
(v) the time frames for completion of those studies and review and for reporting on that monitoring; and	Sections 3 to 4
(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 civil aviation operations at the airport; and	Sections 3 to 4
(vii) the time frames for completion of those specific measures; and	Sections 3 to 4
(viii) details of the consultations undertaken in preparing the strategy (including the outcome of the consultations); and	Sections 1.1, 3.3.4, 4.12.
(ix) any other matters that are prescribed in the regulations; and	Section 1
(j) such other matters (if any) as are specified in the regulations.	Section 1
Paragraphs (a) to (h) do not, by implication, limit paragraph (j).	
72 Planning Period	
(2) The environment strategy in a draft or final master plan must relate to a period of five years.	Section 1: Introduction
83A Compliance with environment strategy in final master plan	
(1) This section applies if a final master plan is in force for an airport.	
(2) The airport-lessee company for the airport must take all reasonable steps to ensure that the environment strategy in the master plan is complied with.	Section 3
(3) A person (other than the airport-lessee company for the airport) who carries on activities at the airport must take all reasonable steps to ensure that the environment strategy in the master plan is complied with.	Section 4.11

LEGISLATION		FINAL DETAILS IN SECTION OF THE AIRPORT ENVIRONMENT STRATEGY
AIRPORTS REGULATIONS 1997 – REG 5.02		
5.02A	Contents of draft or final master plan – matters to be specified in environment strategy	
(1)	For subparagraphs 71(2)(h)(ix) and (3)(h)(ix) of the Act, the matters in this regulation must be specified in an environment strategy.	Sections 3 to 4
(2)	The environment strategy must specify any areas within the airport site to which the strategy applies that the airport-lessee company for the airport has identified as being a site of indigenous significance, following consultation with:	Section 4.9
(a)	any relevant indigenous communities and organisations; and	
(b)	any relevant Commonwealth or State body.	
(3)	The environment strategy must specify the airport-lessee company's strategy for environmental management of areas of the airport site that are, or could be, used for a purpose that is not connected with airport operations.	Sections 3 to 4
(4)	The environment strategy must specify:	
(a)	the training necessary for appropriate environment management by persons, or classes of persons, employed on the airport site by the airport-lessee company or by other major employers; and	Sections 3.3 and 4.11
(b)	the training programs, of which the airport-lessee company is aware, that it considers would meet the training needs of a person mentioned in paragraph (a).	
5.02B	Contents of draft or final master plan – things to be addressed in environment strategy	
(1)	For subsection 71(5) of the Act, a draft or final master plan must address the things in this regulation.	Sections 3 to 4
(2)	In specifying its objectives for the airport under subparagraph 71(2)(h)(i) or (3)(h)(i) of the Act, an airport-lessee company must address its policies and targets for:	
(a)	continuous improvement in the environmental consequences of activities at the airport; and	Sections 3 to 4
(b)	progressive reduction in extant pollution at the airport; and	Sections 4.1, 4.2, 4.6
(c)	development and adoption of a comprehensive environmental management system for the airport that maintains consistency with relevant Australian and international standards; and	Section 3
(d)	identification, and conservation, by the airport-lessee company and other operators of undertakings at the airport, of objects and matters at the airport that have natural, indigenous or heritage value; and	Sections 4.3 and 4.9
(e)	involvement of the local community and airport users in development of any future strategy; and	Sections 1.1, 3.3.4, 4.12
(f)	dissemination of the strategy to sub-lessees, licensees, other airport users and the local community.	Sections 1.1, 3.3.4, 4.12
(3)	In specifying under subparagraph 71(2)(h)(ii) or (3)(h)(ii) of the Act, the areas within the airport site it identifies as environmentally significant, an airport-lessee company must address:	
(a)	any relevant recommendation of the Australian Heritage Council; and	Noted
(b)	any relevant recommendation of the Department of Environment regarding biota, habitat, heritage or similar matters; and	Noted
(c)	any relevant recommendation of a body established in the State in which the airport is located, having responsibilities in relation to conservation of biota, habitat, heritage or similar matters.	Noted
(4)	In specifying the sources of environmental impact under subparagraph 71(2)(h)(iii) or (3)(h)(iii) of the Act, an airport-lessee company must address:	
(a)	the quality of the air at the airport site, and in so much of the regional airshed as is reasonably likely to be affect by airport activities; and	Section 4.4
(b)	water quality, including potentially affected groundwater, estuarine waters and marine waters; and	Section 4.1
(c)	soil quality, including that of land known to be already contaminated; and	Section 4.2
(d)	release, into the air, of substances that deplete stratospheric ozone; and	Section 4.4
(e)	generation and handling of hazardous waste and any other kind of waste; and	Section 4.7
(f)	usage of natural resources (whether renewable or non-renewable); and	Sections 4.1, 4.4, 4.7, 4.8
(g)	usage of energy the production of which generates emissions of gases known as 'greenhouse gases'; and	Sections 4.4 and 4.8
(h)	generation of noise.	Section 4.5
(5)	In specifying under subparagraph 71(2)(h)(iv) or (3)(h)(iv) of the Act the studies, reviews and monitoring that it plans to carry out, an airport-lessee company must address:	
(a)	the matters mentioned in subregulation 5.02A(2) and subregulations 5.02B(3) and (4); and	Sections 3 to 4
(b)	the scope, identified by the airport-lessee company, for conservation of objects and matters at the airport that have natural, indigenous or heritage value; and	Sections 4.3 and 4.9

LEGISLATION		FINAL DETAILS IN SECTION OF THE AIRPORT ENVIRONMENT STRATEGY
(c)	the approaches and measures identified by the airport-lessee company as its preferred conservation approaches and measures; and	Section 4.3
(d)	the professional qualifications that must be held by a person carrying out the monitoring; and	Section 3
(e)	the proposed systems of testing, measuring and sampling to be carried out for possible, or suspected, pollution or excessive noise; and	Section 3
(f)	the proposed frequency of routine reporting of monitoring results to the airport environment officer (if any) for the airport, or to the Secretary.	Section 4
(6)	In specifying under subparagraph 71(2)(h)(vi) or (3)(h)(vi) of the Act, the measures that it plans to carry out for the purposes of preventing, controlling or reducing environmental impact, an airport-lessee company must address:	
(a)	the matters mentioned in subregulations (2) to (4); and	Sections 3 to 4
(b)	the means by which it proposes to achieve the cooperation of other operators of undertakings at the airport in carrying out those plans.	Section 4.11
(7)	An airport-lessee company, in specifying the company's strategy for environmental management under subregulation 5.02A(3), must address the matters in subregulations (2) to (6).	Sections 3 to 4
(8)	In this regulation: *Department of Environment* means the Department administered by the Minister responsible for administering the *Environment Protection and Biodiversity Conservation Act 1999.*	Noted

Note 1
Subregulation 6.07 (2) – Airport (Environment Protection) Regulations 1997
A change of use to which paragraph (1) 9d) applies is a change that necessitates greater environmental protection measures because the use will result in the land being used in a way, or for a purpose, that will, or is reasonable likely to, cause greater harm:
(a) to an aspect of the environment; or
(b) to the health, safety or, in any respect, the welfare or, human beings.

SECTION 6

Figures and Tables

6

SECTION 17

Figures and Tables

FIGURES

TABLES

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