Australian Government
Department of Infrastructure and Regional Development

WESTERN SYDNEY AIRPORT

REVISED DRAFT
Airport Plan

Revised Draft Airport Plan
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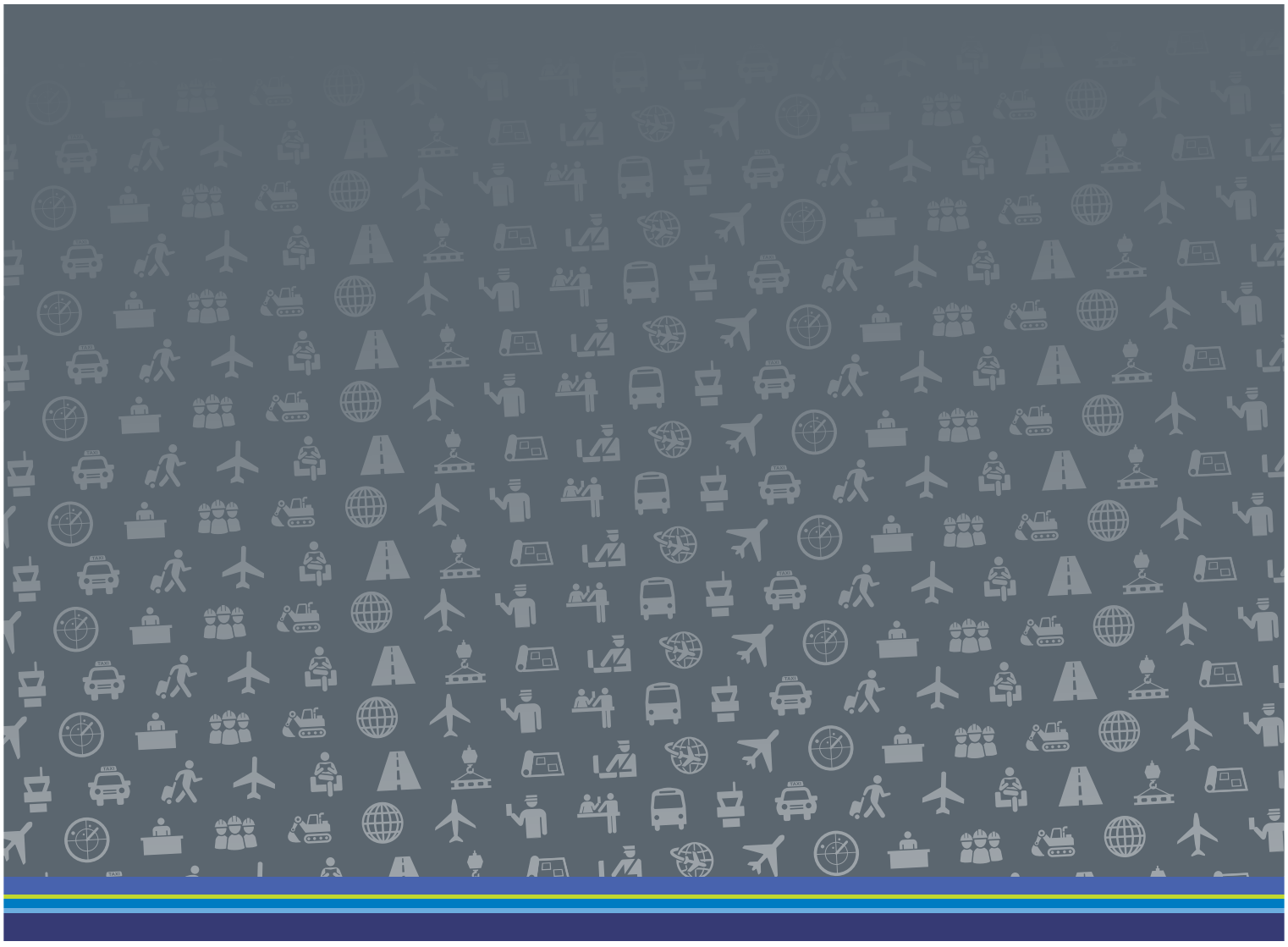
Table of contents

PART 1:
Airport Plan for Western Sydney Airport



Part 1: Airport Plan for Western Sydney Airport

Determination of Airport Plan

On 19 October 2015 the Western Sydney Airport draft Airport Plan was released for public exhibition, alongside the draft Environmental Impact Statement (EIS). The 60-day exhibition period provided the opportunity for the community to have their say on the proposed airport, with nearly 5,000 submissions received.

The revised draft Airport Plan takes account of the community's comments. A full report on the submissions received and how the community's comments have been addressed is available in Volume 5 of the final EIS.

After the EIS is finalised, the Infrastructure Minister may provide a draft of the Airport Plan to the Environment Minister. The Environment Minister will consider the finalised EIS and draft Airport Plan from an environmental perspective and notify the Infrastructure Minister whether the Airport Plan should be determined and, if determined, whether specific conditions or provisions should be included for the purpose of protecting the environment.

If an Airport Plan is determined it must include any conditions or provisions required by the Environment Minister.

1.1 Overview

Western Sydney Airport (the Airport) will be developed and operated under the *Airports Act 1996* (the Act). The Airport is known as Sydney West Airport under the Act.

The Act has been amended to provide for this Airport Plan, which is a transitional planning instrument for the initial development of the Airport as a greenfield site. The amendments to the Act accommodated the Australian Government's unique requirements by combining separate approval processes into one streamlined and transparent authorisation process, meaning this transformational project could be delivered sooner.

In accordance with section 96C of the Act, this Airport Plan consists of two main parts: the concept design (Part 2) and the details of the specific developments authorised by the Airport Plan (Part 3), which are referred to collectively as 'Stage 1' or the 'Stage 1 Development'.

This Airport Plan is primarily concerned with the Stage 1 Development, which is intended to establish the Airport with a single 3,700m runway located in the north-western portion of the Airport Site, a terminal and other support facilities to provide an operational anticipated capacity of approximately 10 million regional, domestic and international passengers per year, as well as freight traffic. This would cater for the predicted demand on opening as well as estimated growth for the first five years of operations. A first-stage airport of this scale also provides the foundation for further expansions as demand grows.

Once an airport lease is granted by the Commonwealth to an airport lessee company (ALC), the ALC will then become responsible for the Airport Site and construction of the Airport.

Upon opening, the Airport will be a full-service airport offering domestic, international and freight air services. Further development would be staged in line with demand to include more substantial terminal, support and commercial facilities. As demand approaches 37 million passengers per year – anticipated to be around 2050 – a second, parallel runway is expected to be required. The Airport is expected to be capable of handling approximately 82 million passengers a year by around 2063.

The design of the Airport Site will take into account an alignment for rail and locations of stations, so that the land to meet rail requirements is properly preserved, including for tunnels and station boxes.

Developments after Stage 1 will be undertaken under the planning framework in Part 5 of the Act, which applies to existing airports covered by the Act (see section 1.3).

1.2 Content and structure of this Airport Plan

This Airport Plan consists of this Part 1, Part 2 (Concept Design) and Part 3 (Specific Developments).

Part 2 (Concept Design) sets out the Government's development objectives for the Airport, starting with the Stage 1 Development. The potential long-term development is referenced in Part 2 because it informs the Stage 1 Development concept design.

Part 2 also contains a Land Use Plan and indicative noise contours.

Part 3 (Specific Developments) describes what is authorised to be developed on the Airport Site (and any Associated Site) and includes conditions relating to how the developments are to be undertaken and operated, which have been informed by the EIS. Requirements for the carrying out of these developments, including detailed specifications, will be contained in contractual documents.

Following determination of the Airport Plan, further detailed design of the Airport, including the Airport Site layout, will occur in accordance with the contractual arrangements entered into between the Commonwealth, the ALC and any contractor engaged to undertake the developments set out in Part 3. The detailed design for the Airport will be required to comply with this Airport Plan and the contractual documents. It is expected that the finalised layout will be publicly released.

1.3 Regulatory context

1.3.1 Airports Act 1996 – Land use, planning and building controls

The Act contains a land use, planning and building control framework for airports covered by the Act. That framework includes provision for preparation, consultation on and approval of master plans and any major development plan (MDP) as well as building approvals.

To facilitate the development of the Airport as a greenfield site, Part 5 of the Act provides for the preparation of an Airport Plan as a transitional measure to bring the Airport Site within the generally applicable regime under the Act.

Part 2 of the Airport Plan provides the planning framework for the Airport until the first master plan is in place. Within five years of the airport lease being granted, or such longer period as allowed by the Infrastructure Minister, the ALC will be required to submit for approval a full master plan, which will replace Part 2. Master plans are subject to community consultation.

Part 3 of the Airport Plan sets out and authorises the Stage 1 Development. Once the airport lease has been granted, the developments authorised by Part 3 will require building approvals under the Airports (Building Control) Regulations 1996 (Building Regulations) that reference relevant standards, such as the Building Code of Australia.

Any developments by the ALC on the Airport Site that are not covered by Part 3 will be subject to the existing regulatory regime contained in Part 5 of the Act, including building approvals and a requirement for public consultation on and approval of an MDP, for major airport developments.

This Airport Plan may be varied under the Act. The advice of the Environment Minister needs to be sought on a variation to the Airport Plan before it is made. This is because the variation of the Airport Plan is treated in the same way as approval of an MDP. In addition, any variation to a condition or provision required to be included in the Airport Plan by the Environment Minister to protect the environment may only be varied with the approval of the Environment Minister.

Other parts of the Act that are particularly relevant for the development and operation of the Airport include:

- the protection of airspace framework set out in Part 12 of the Act and the Airports (Protection of Airspace) Regulations 1996 (the Airspace Protection Regulations) – airspace surrounding the Airport is intended to be protected under Part 12;
- the environmental management framework set out in Part 6 of the Act and the Airports (Environment Protection) Regulations 1997;
- the quality of service monitoring and reporting framework set out in Part 8 of the Act – Part 8 will apply to the airport once it becomes operational; and
- the requirements relating to the control of on-airport activities provided for in Part 11 of the Act – some regulations made under Part 11 may be applied at the airport.

The Department of Infrastructure and Regional Development is responsible for administering the Act.

1.3.2 State planning considerations

Section 112 of the Act provides that Part 5 of the Act, which relates to land use, planning and building controls and provides for the preparation of this Airport Plan, is intended to apply to the exclusion of a law of a State. Nonetheless, development of the Airport Plan has taken into account a range of New South Wales (NSW) and local government planning documents, including:

- NSW 2021: A Plan to Make NSW Number One;
- A Plan for Growing Sydney (the Metropolitan Plan);
- 2014 State Infrastructure Strategy Update;
- NSW Long Term Transport Master Plan 2012;
- Western Sydney and Blue Mountains Regional Action Plan;

- NSW Freight and Ports Strategy;
- Sydney's Rail Future, Sydney's Bus Future, and Sydney's Cycle Future;
- State Environmental Planning Policy (Sydney Region Growth Centres) 2006;
- State Environmental Planning Policy (Infrastructure) 2007;
- South West Growth Centre Structure Plan (under review);
- State Environmental Planning Policy (Western Sydney Employment Area) 2009;
- Draft Broader Western Sydney Employment Area Structure Plan 2013;
- Western Sydney Priority Growth Area 2015; and
- The National Airports Safeguarding Framework, as applied in NSW.

1.3.3 Civil aviation regulation

The Airport will require certification from the Civil Aviation Safety Authority (CASA) under the *Civil Aviation Act 1988* and Civil Aviation Safety Regulations 1998 (CASR) before the start of operations.

1.3.4 Airport design standards

In order to provide the most efficient and safe operation of the Airport, the current versions of the following codes and regulations were taken into account in development of this Airport Plan. The detailed design for the Airport will consider the most up-to-date standards.

Civil Aviation Safety Authority standards and regulations

The Airport will need to comply with the Manual of Standards (MOS) – Part 139 Aerodromes, Version 1.10, May 2012.

International Civil Aviation Organization Standards and Recommended Practices

In addition to the regulatory requirements under the CASR and MOS, in order to provide the most efficient and safe operation of the Airport, the following International Civil Aviation Organization (ICAO) Standards and Recommended Practices were taken into account in development of this Airport Plan. The detailed design for the Airport will consider the most up-to-date standards.

- Annex 14 – Aerodromes Volume 1, Aerodrome Design and Operations, 6th Edition, July 2013;
- ICAO Doc. 9157 Aerodrome Design Manual, Part 1, Runways, 3rd Edition, 2006;
- ICAO Doc. 9157 Aerodrome Design Manual, Part 2, Taxiways, Aprons, Holding Bays, 4th Edition, 2005;
- ICAO Doc. 9157 Aerodrome Design Manual, Part 3, Pavements, 2nd Edition, 1983;
- ICAO Doc. 9157 Aerodrome Design Manual, Part 4, Visual Aids, 4th Edition, 2004;
- ICAO Doc. 9137 Airport Services Manual, Part 6, Control of Obstacles, 2nd Edition, 1983;
- ICAO Doc. 9643 Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways, 1st Edition, 2004; and
- ICAO Doc. 4444-ATM/501, Air Traffic Management, Amendment 2, November 2009.

1.3.5 Environmental legislation

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) will have ongoing application at the Airport Site, including the requirement for a referral under Part 11 of the EPBC Act prior to approval of a MDP.

1.3.6 Other regulations

Other Commonwealth legislation that will regulate or influence the design, construction and operation of the Airport includes:

- *Aviation Transport Security Act 2004;*
- *Air Navigation Act 1920*;
- *Customs Act 1901*;
- *Crimes (Aviation) Act 1991*;
- *Biosecurity Act 2015*;
- *Airspace Act 2007*; and
- *Air Services Act 1995*.

1.4 The benefits of a Western Sydney Airport [1]

Western Sydney would be Australia's third-largest economy and fourth-largest city in its own right. However, it does not have its own airport and around 30 per cent of workers living in Western Sydney commute outside the region for work. While nine per cent of Australia's population lives in Western Sydney, access to an airport for these residents can involve a two-hour commute.

Acknowledging the significant benefits that would be generated by a new airport, the Australian Government announced in April 2014 that Badgerys Creek would be the site for an airport in Western Sydney. A new airport would be a major catalyst for investment and jobs growth in the Western Sydney region, and would also bring benefits to the Australian economy more broadly[2].

- By 2030, Western Sydney is expected to be home to around three million people. A Western Sydney airport would vastly improve access to aviation services for this growing population.
- Demand for passenger journeys in the Sydney region will more than double, from 40 to 87 million, over the next 20 years.
- An airport in Western Sydney would generate an estimated $24.6 billion in direct expenditure by 2060, and contribute a $23.9 billion increase in Gross Domestic Product (GDP) to the national economy.
- An airport in Western Sydney would be a catalyst for investment and job creation in the region. Airports are unique jobs drivers, employing more people when operational than during

[1] These are not development objectives for the purposes of subsection 96C(2) of the Act. The development objectives are set out in Part 2.
[2] A Study of Wilton and RAAF Base Richmond for Civil Aviation Operations, Commonwealth of Australia, April 2013 - http://westernsydneyairport.gov.au/scopingstudy/index.aspx

construction. They offer a diverse range of employment opportunities in aviation, supporting services and non-aviation industries.
- Setting the strategic vision for a sustainable and economically viable airport will deliver maximum benefits for Western Sydney, NSW and Australia.

Australian Government objectives

The Airport is intended to achieve the following objectives:

- improving access to aviation services for Western Sydney;
- resolving the long-term aviation capacity constraints in the Sydney basin;
- maximising the economic benefit for Australia by maximising the value of the Airport as a national asset;
- optimising the benefit of the Airport for employment and investment in Western Sydney; and
- delivering sound financial, environmental and social outcomes for the Australian community.

To help meet these objectives this Airport Plan has been developed using sound airport planning principles, notably flexibility, creativity and vision, and constructability and feasibility. These are discussed below.

Flexibility

Successful airport planning provides a framework for airports to develop in response to demand over a long period of time. The success of this Airport Plan will be defined by how well it enables the Airport to meet its immediate needs, while also adapting to changing trends; growing in stages to meet increasing and evolving demand.

This Airport Plan has been developed to optimise the use of the available site for growth into a high capacity international airport of at least 82 million annual passengers (MAP).

Creativity and vision

A measure of success for an airport is the level of creativity and vision. The Airport Plan needs to provide a balance between the reliance on known technological advances in areas like air traffic control, avionics and security, and the possibility of innovations enabling new ways of operating an airport. The plan must look beyond the timeframe for which the industry can comfortably predict future requirements.

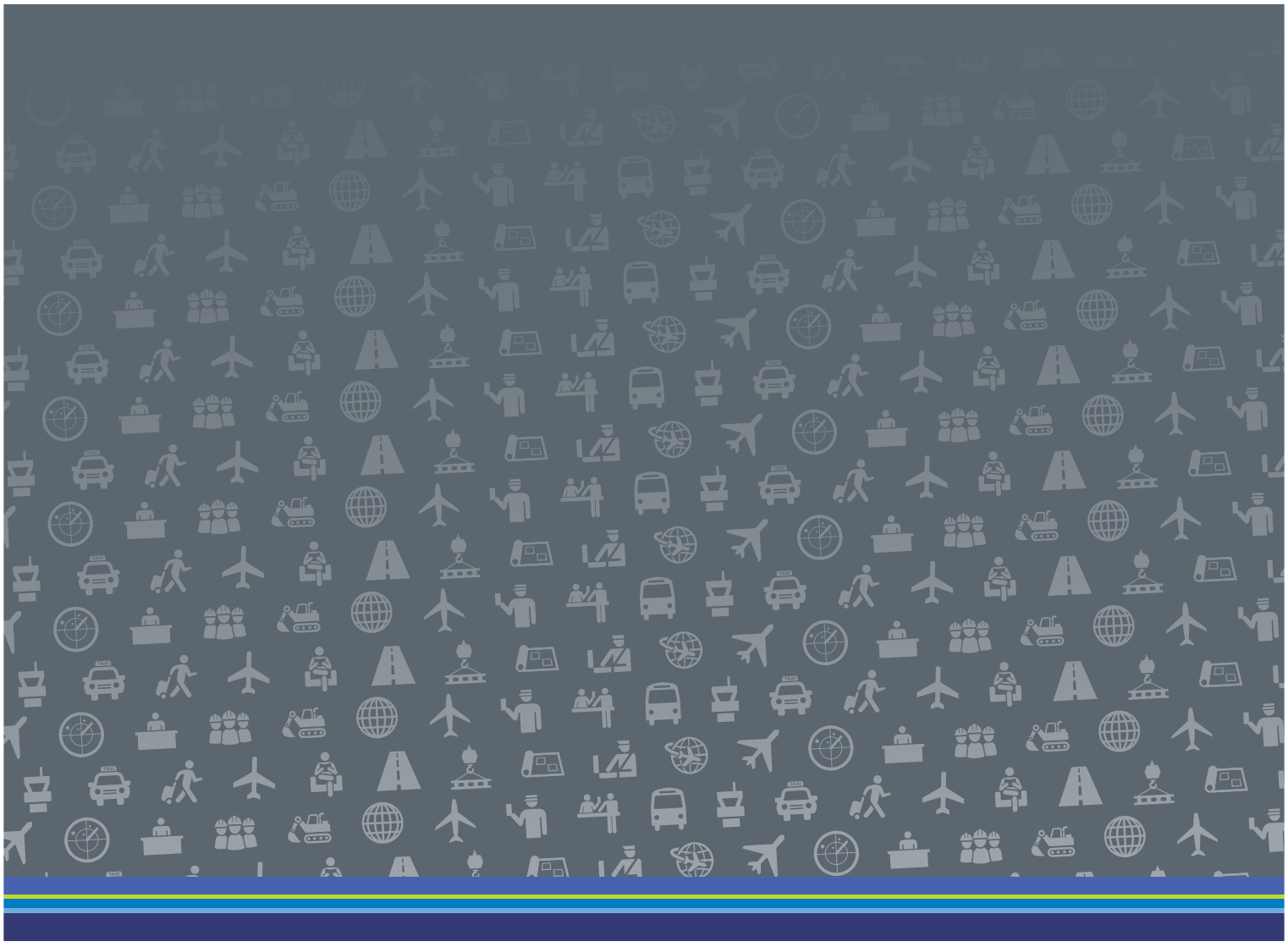
This Airport Plan has been developed to meet the operational and passenger service performance standards of a busy international and domestic airport.

Constructability and feasibility

A successful plan will identify the developments required to meet growth over an extended period of time, maximising the use of the site, and ensure these developments can be built in a way that does not severely disrupt operations during construction. For the Airport Plan, these developments have been planned in sufficient detail to provide the basis for initiating the design process.

PART 2:

Concept Design



Part 2: Concept Design

This part of the Airport Plan sets out a concept design for the Airport. Within the first five years of an airport lease being granted by the Commonwealth, or such longer period as allowed by the Infrastructure Minister, the ALC is required to submit for approval a master plan. An airport lease may be granted more than five years before the airport commences operations. Part 2 provides the planning framework for the Airport until the first master plan is in force.

Part 2 of the Airport Plan will be superseded once a master plan for the Airport comes into effect.

Part 2 of the Airport Plan includes:

- development objectives for the Airport;
- maps showing contours of projected aircraft noise for the areas surrounding the airport;
- proposals for land use and related development of the Airport Site; and
- various other matters related to the anticipated development and growth of the Airport, including details of the process by which airspace for the airport will be developed.

While Part 2 includes an overview of aspects of the Stage 1 Development for the purposes of outlining the concept design for the airport, Part 3 of the Airport Plan sets out details of the developments that make up the Stage 1 Development. To the extent that Part 2 contains an overview of the developments that make up the Stage 1 Development, that overview is a summary only and it is not intended to qualify or restrict the developments set out in Part 3.

2.1 Development Objectives

2.1.1 The need for an airport

The 2012 *Joint Study on aviation capacity in the Sydney region* (Joint Study) identified growing airport capacity constraints in the Sydney basin. The Joint Study found that Sydney (Kingsford Smith) Airport (Sydney Airport) will be unable to meet the increasing demand in the Sydney basin, and airlines will increasingly be unable to schedule new services at their preferred time. In particular, the Joint Study found that:

- by 2020, all slots on weekdays between 6.00 am and 12.00 noon and between 4.00 pm and 7.00 pm would be fully allocated;
- by 2027, there would effectively be no slots unallocated, with an unmet demand of more than 100 flights per day; and
- by 2035, it is unlikely that there will be any usable capacity available for new services at Sydney Airport.

Despite these increasing constraints on capacity, Sydney Airport is expected to continue to grow over the next two decades. The 2013 Sydney Airport Master Plan (SACL 2014) forecasts average growth of 3.4 per cent per year, with the airport reaching 74.3 MAP by 2033. The primary long-term strategic plan is the integration of international and domestic operations at Sydney Airport based on passenger transfer flows.

The Joint Study found that without significant additional aviation capacity in the Sydney basin, the domestic airline sector would become increasingly constrained and new services from international markets – particularly from Asia as its economic transformation gathers pace – could not be accommodated.

The Joint Study calculated that by 2060, around 54 MAP journeys would go unmet. The associated economic cost was estimated at $34 billion of GDP, with 77,900 jobs foregone by 2060. Around three-quarters of foregone employment opportunity would be from NSW.

2.1.2 Western Sydney Airport development overview

The Airport Site is located approximately 50 kilometres (km) from Sydney's central business district. It is bounded by Elizabeth Drive to the north, Willowdene Avenue, The Northern Road (A9) and private land to the south, and by private land along Adams Road to the north-west. Badgerys Creek flows in a north-easterly direction and forms the south-eastern boundary of the airport site. A portion of The Northern Road currently cuts across the south-western part of the Airport Site and will be relocated around the edge of the Airport Site to allow the development of the Airport to proceed.

Figure 1: Airport Site location

The current declared area of the Airport Site is approximately 1,780 hectares (ha).

The Airport is expected to be developed in stages to match demand. Informed by practices in use at high-capacity international airports, the concept design provides for the Airport's development to be staged in response to demand and to include planning for services and amenities that are easily expandable over time, providing scalable capacity for aircraft, passengers, cargo and vehicle movements.

Part 3 of the Airport Plan describes and authorises the Stage 1 Development. The timing and scope of subsequent stages of development are indicative only.

Stage 1 Development

The Stage 1 Development will include major site preparation, removing or relocating infrastructure from the site and earthworks to prepare the Airport Site.

Airport operations are proposed to commence around the mid-2020s, with capacity for approximately 10 MAP – the anticipated demand level approximately five years after operations commence.

The Stage 1 Development is expected to accommodate approximately 63,000 passenger and freight air traffic movements (ATM) per year. Each landing or departure constitutes one ATM. This is approximately 21 ATM per hour during busy times (referred to as 'busy hour ATMs' – see section 2.1.4).

The Stage 1 Development will require the construction of one 3,700 metre (m) runway with a width of 60m in the north-western half of the site, on a south-west/north-east 05/23 orientation[3] with a single full-length parallel taxiway as a minimum and connecting taxilanes. The Stage 1 Development is planned to be capable of handling both domestic and international services.

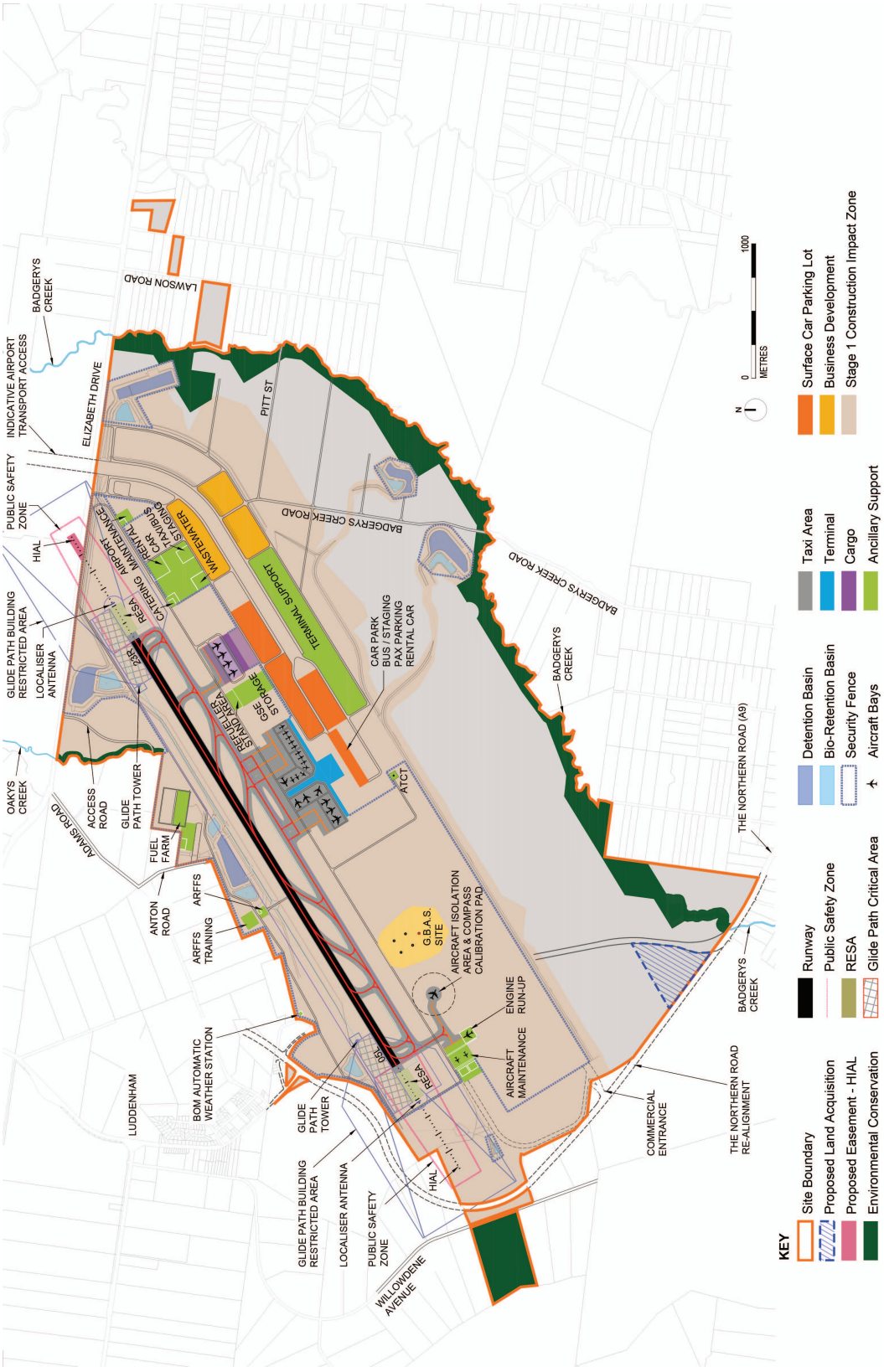
The Government's primary objectives are to improve access to aviation services for Western Sydney and solve the long-term regular public transport (RPT) capacity constraints in the Sydney basin. Bankstown Airport remains the principal general aviation aerodrome in the Sydney basin. While not explicitly planning for general aviation, future use of the airport for such activity is not excluded and investment in associated support facilities will be a commercial decision for the ALC in consultation with the general aviation sector, and subject to relevant approvals.

Aviation infrastructure, aviation support facilities and network infrastructure, including utilities and ground transport facilities, will be developed before operations commence. Areas of land on the Airport Site have also been reserved for commercial development.

The indicative layout for the Stage 1 Development shown in Figure 2 has been designed to achieve maximum use of the Airport Site and plan for growth beyond the Stage 1 Development to accommodate the anticipated long-term demand. The indicative Airport layout takes into account the size, shape and orientation of the available land without requiring the acquisition of significant additional land (see Site considerations below).

[3] An orientation (magnetic) of 50/230 degrees, plus or minus up to five degrees.

Figure 2: Indicative Airport layout (Stage 1)

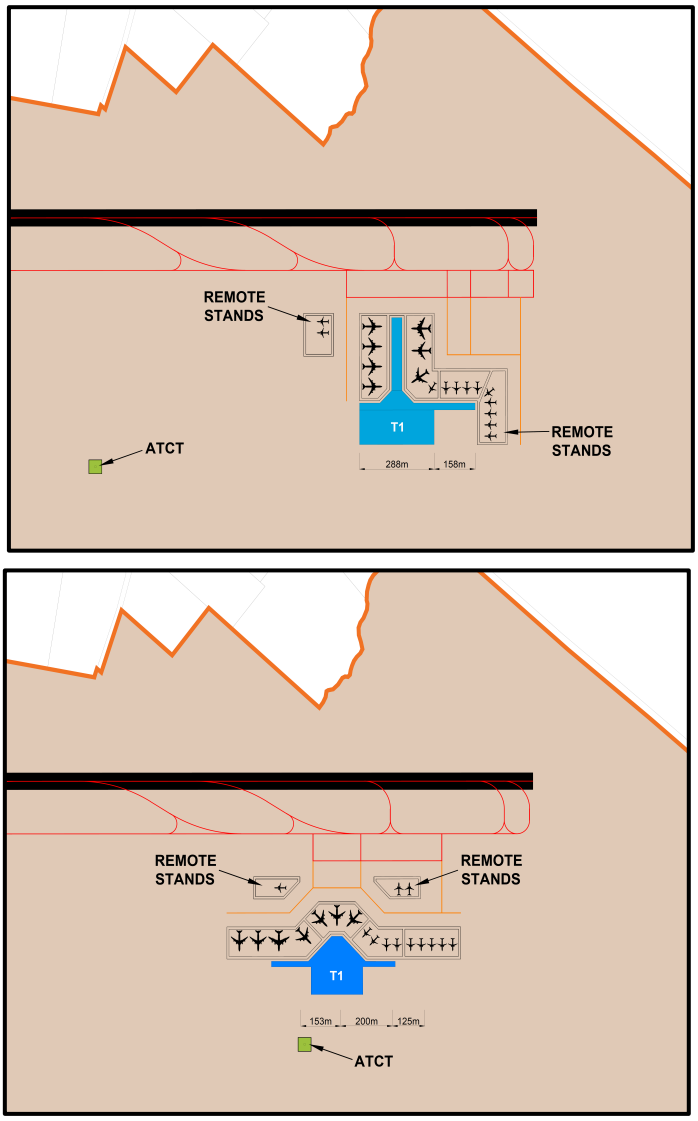


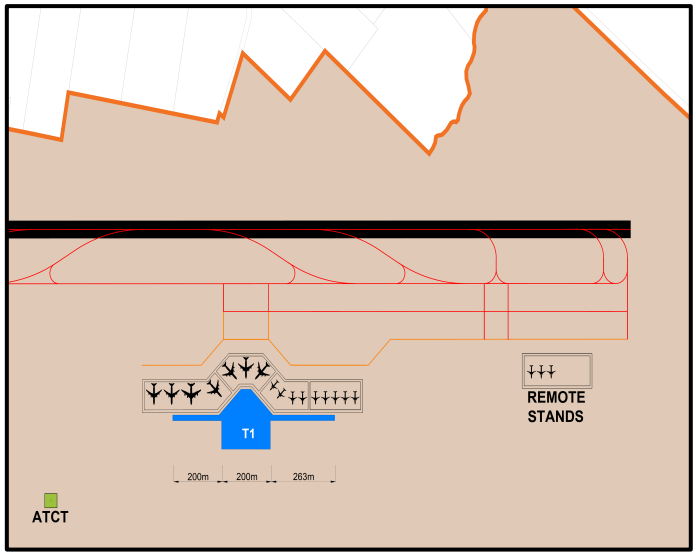
This represents only one possible layout; the actual layout will be determined through detailed design works and subject to approval by the Commonwealth. Whilst the location of the runway is fixed, other elements, such as the location and shape of the terminal and cargo areas, may change provided they comply with the Land Use Plan (see section 2.4).

The Stage 1 Development has been scaled to match anticipated demand. This includes the terminal and supporting infrastructure. It will be designed to be flexible enough to accommodate expansions required for anticipated growth in demand. The main objective is to achieve reliable and efficient passenger processing and operations.

Some examples of possible terminal layouts, in addition to the indicative layout shown in Figure 2, that could meet the Stage 1 Capacity requirements are provided in the Figure 3.

Figure 3: Alternative indicative Stage 1 terminal layouts





Design of the final airport layout will be the responsibility of the ALC, subject to compliance with the Commonwealth's requirements.

As demand grows beyond the initial Stage 1 Capacity, incremental development would continue to add capacity with the development of additional taxiways, aprons, terminals and support facilities. The Airport will also include some commercial development in designated areas, which would expand over time in response to demand.

Second runway

The first runway is expected to reach capacity at around 37 MAP, which corresponds to approximately 185,000 ATM per year, or 49 busy hour ATMs. To meet additional demand, a second parallel runway 3,700m long is expected to be required around 2050. This Airport Plan has been developed on the assumption that the second runway is expected to have a runway centre-line separation distance of approximately 1,900m from the first runway thereby providing adequate room for anticipated long-term demand.

The Land Use Plan provides reserved areas for future aeronautical use, including a second runway, on the Airport Site (see section 2.4 and Figures 16 and 17).

Long-term forecast

Following development of the second runway, additional infrastructure, such as taxiways and additional terminal capacity, would be developed. By around 2063, the total ATM per year is forecast to be 370,000, serving approximately 82 MAP.

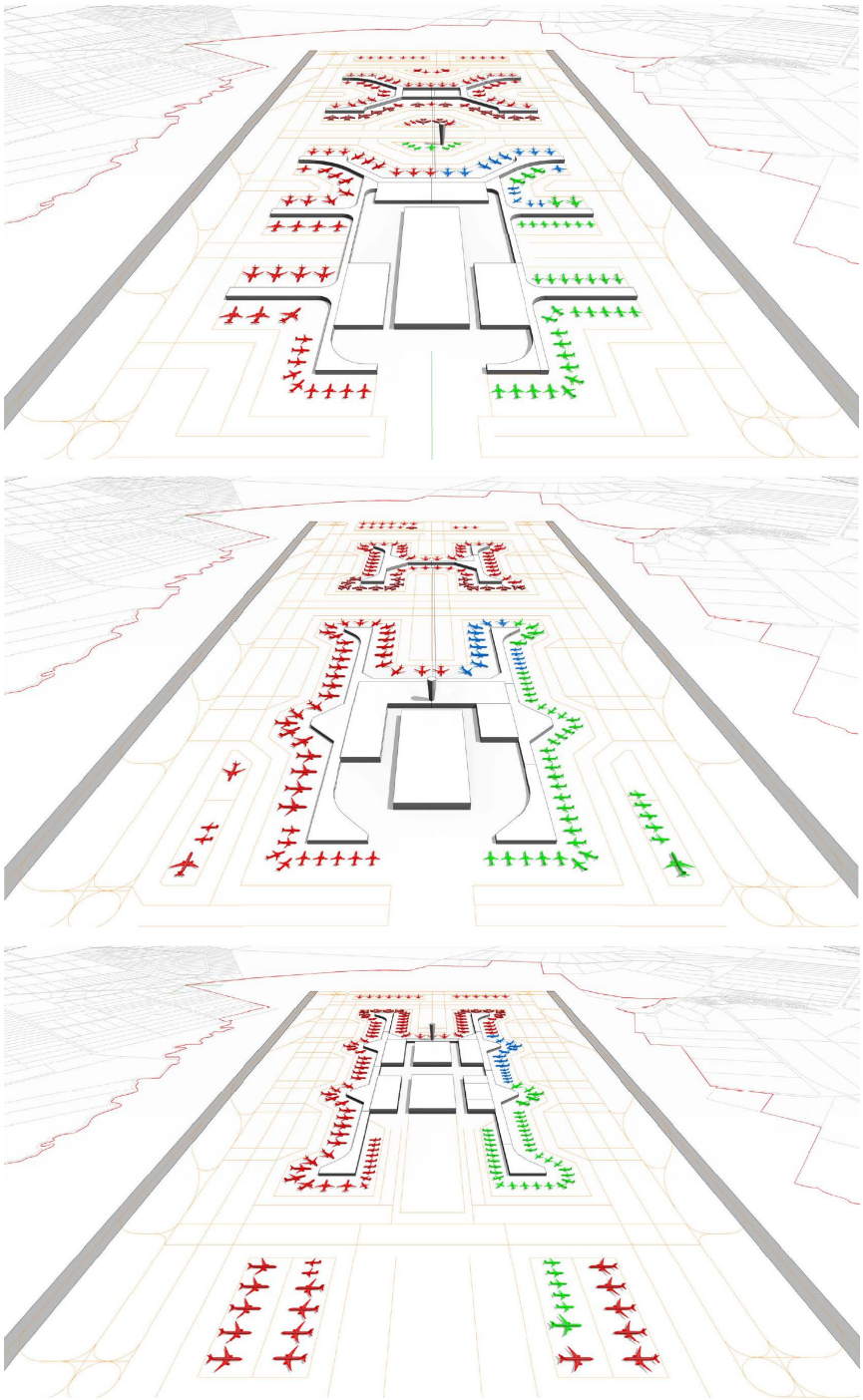
Capacity in excess of 82 MAP may be achievable for the Airport Site, depending on future aircraft fleet mix and operations.

An indicative long-term layout of the airport is at Figure 4.

Figure 4: Indicative Airport layout (Long Term)

Figure 4 represents only one indicative, long-term layout to deliver the required airport capacity. The layout would be developed and refined through successive master plans. Some examples of alternative terminal layouts for the airport in the long term are shown in Figure 5, with the first two diagrams representing the possible use of satellite terminals.

Figure 5: Alternative indicative layouts (Long Term) – view from Elizabeth Drive



Site considerations

The Airport Site is on land currently owned by the Commonwealth. The following areas are expected to need to be acquired to support the development and operation of the Airport, and incorporated into the Airport Site:

- the portion of The Northern Road that currently transects the Airport Site; and
- a triangular portion of land in the south of the site, required to accommodate the development and operation of the southern runway (see Figure 4).

The Commonwealth will also need to acquire interests on adjacent land for the purposes of the installation of High Intensity Approach Lighting (HIAL). The area on which HIAL, for the Stage 1 Development, will be constructed will be an Associated Site if it is not part of the Airport Site at the relevant time (for example if the HIAL is constructed on an easement).[4]

The Commonwealth expects to also make available areas of the site for the purposes of improving transport and utilities connections, such as realignment of The Northern Road by NSW Roads and Maritime Services (RMS).

These acquisitions and disposals are expected to result in minor variations to the boundaries of the Airport Site as well as the total area.

2.1.3 Sustainability

The Airport will be designed to meet the sustainability requirements, as outlined in the EIS. As the Airport develops beyond Stage 1, it will maintain similar or better levels of sustainability and is also expected to take account of developments and innovations in the area of sustainability.

In addition, under the Act, the ALC will be required to produce a master plan every five years, which will include a detailed environment strategy.

2.1.4 Aviation activity – indicative forecasts

This Airport Plan has been developed taking into account various forecasts of airport capacity, activity and fleet mix as set out below. These forecasts are indicative and have been provided to give context for the concept design for the Airport as set out in this Airport Plan.

Airfield capacity

To reaffirm that the Airport Site could be used as a high-capacity airport to accommodate any aircraft fleet mix, Airservices Australia assessed the implications for airspace and air traffic management approaches for Sydney basin airspace arising from an airport at Badgerys Creek.[5] The fundamental assumptions applied for this assessment included: runway length of 4,000m with a 05/23 orientation; wide-spaced runways (i.e. over 1,525m); a fleet mix similar to that accessing Sydney Airport; use of Rapid Exit Taxiways (RETs) to minimise runway occupancy time; use of

[4] An Associated Site is an area of land outside the Airport Site with rights for airport-related development, refer to section 96L of the Act.
[5] Airservices Australia, Western Sydney Airport, Preliminary Airspace Management Analysis, Final Report, 10 – April - 2015.

Bureau of Meteorology local data; and, with minor exceptions, use of existing approved air traffic control design and operating standards[6].

This proof-of-concept analysis indicates that the Airport could potentially achieve the following capacity (per hour) with parallel runway operations:

- 45 landing operations;
- 58 departure operations; and
- 103 total ATM[7].

Activity forecasts

Table 1 summarises the indicative forecasts on which planning for the key stages of the Airport development have been based:

- the annual passenger demand in terms of MAP;
- ATM; and
- busy hour[8] passenger and ATM demand at the Airport.

Table 1: Summary of activity forecasts

	Stage 1	First runway at capacity (c.2050)	Long Term (c.2063)
Annual passengers (arrivals and departures)	**10 MAP**	**37 MAP**	**82 MAP**
Busy hour passengers (international and domestic)	**3,300**[9]	**9,500**	**18,700**
Total annual ATM (passenger and freight)	**63,000**	**185,000**	**370,000**
Total busy hour ATM	**21**	**49**	**85**

In comparison, the 2015 passenger numbers for the top five Australian airports were: Sydney 39.8 MAP, Melbourne 32.8 MAP, Brisbane 22 MAP, Perth 12.6 MAP and Adelaide with 7.7 MAP.

Operations are planned to commence at the Airport around the mid-2020s. Initial demand is forecast to be modest at around 5 MAP and is expected to grow steadily in the first few years of operation. The Stage 1 Development is expected to handle approximately 10 MAP, which corresponds to approximately 21 ATM per hour during busy hours to match forecast annual activity of 63,000 ATM.

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[6] Some of these assumptions have changed as the Airport Plan has been developed. None of the changes to the assumptions in the proposed Airport layouts, such as the reduction in runway length from 4,000m to 3,700m and increase in runway separation from 1,525m to 1,900m, are considered material to the findings and results of Airservices Australia.

[7] Movement numbers are runway-specific and will require further consideration of the implication or limitations of airspace management within the Sydney basin in detailed future airspace design.

[8] Peak month, design day, and busy hour factors for the Airport were developed for domestic passenger activity, international passenger activity and freighter activity. The busy hour activity determines the greatest amount of demand being placed upon facilities required to accommodate passenger and aircraft movements. Busy hour generally represents a typical hour (or period) of the day when the aviation activity at an airport is at its highest. Care is taken to not choose the absolute busiest hour (or the greatest amount of demand being placed upon facilities) in a given year – as this can be an anomaly and can lead to over-estimating the facility requirements. Hence 'busy hour', according to the International Air Transport Association, is calculated as the busiest hour in the second busiest day of the average week of the peak month. This is done in order to filter out hours or days of abnormally high activity.

[9] Refers to overall busy hour passengers per day; separate busy hours for arrivals and departures may occur outside this period.

The volume and profile of passengers that the Airport is expected to serve will evolve over time in response to growing demand and the Airport's relative market position. It is expected that in the early years, around 80 per cent of passenger demand at the Airport would be for domestic travel. Domestic demand is likely to be focused on capital city services, including Melbourne, Brisbane and Perth, as well as the Gold Coast.

Over time, it is expected that the Airport will experience greater demand, with growth particularly strong in international RPT as residual capacity at Sydney Airport is exhausted. It is expected that the Stage 1 Development would be capable of serving approximately two million international passengers. Demand is expected to reach approximately 19.5 international MAP by 2050. By this time, the domestic-international split at the Airport could be approximately 47 per cent domestic and 53 per cent international. In the long term, the Airport will serve all types of aviation traffic, including full-service carriers (FSC), low-cost carriers (LCC), international, domestic, connecting and regional traffic.

Freight aircraft are also expected to operate at the Airport. Most freight would be transported in the hold of passenger planes, with dedicated freight aircraft accounting for just 11 per cent of total ATM. The Stage 1 Development could accommodate approximately 7,000 dedicated freight ATM. Around 2063, approximately 30,000 dedicated freight ATMs are forecast.

Transport systems need to be designed to meet busy hour demand to ensure that users consistently receive a satisfactory level of service and are not subject to significant congestion.

It is anticipated that the Airport could grow to approximately 82 MAP around 2063.[10] This corresponds to approximately 85 ATM per hour during busy hours to match forecast annual activity of 370,000 ATM. Designing for busy hour activity will provide a design size for facilities that ensures they are neither underutilised nor overcrowded. Best practice design and functionality will provide for flexibility in airport operations. The major functional areas of the Airport (i.e. terminal, runways and roads) are expected to be designed to accommodate the busy hour passenger or busy hour aircraft demand.[11]

Establishing a curfew-free airport in the Sydney basin presents an opportunity to grow international demand and accommodate a gap in current services in the Sydney basin.

Aircraft fleet mix

This Airport Plan has been developed to provide maximum flexibility to accommodate any aircraft fleet mix anticipated to use the Airport. Aircraft are classified by size using a reference code letter. The anticipated aircraft fleet mix will consist mainly of Code C and E, with some Code B and F aircraft.

Table 2 outlines the fleet mix categories and provides an example of each type.

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[10] Although it is difficult to predict long-term future outcomes, the ultimate capacity of the Airport's two runway system could exceed 82 MAP and 85 ATM per hour depending on future fleet mix and technology. The Airservices Australia preliminary airspace analysis, using the current fleet mix and technology, suggests this could possibly be as high as 103 ATM per hour.

[11] The estimate of 85 busy hour ATMs for the long-term scenario (2063) is based on the aviation activity forecasts, and is distinct from the maximum airport capacity ATM per hour assessed by Airservices.

Table 2: Aircraft reference codes and examples

ICAO aircraft reference code letter	Example aircraft
A	General aviation aircraft
B	SAAB 340; Bombardier Dash 8 (Q400); ATR72
C	Boeing 737; Airbus 320; Embraer 190
D	Boeing 767
E	Airbus 330 and 350; Boeing 747-400, 777 and 787
F	Airbus 380; Boeing 747-8

In the early years, Code C aircraft are expected to account for the majority of domestic operations, representing approximately 90 per cent of the domestic fleet mix. In the long term, Code C aircraft could represent 80 per cent of the domestic fleet mix.

In the early years, Code C aircraft are expected to represent approximately 40 per cent of the international fleet mix, and Code E approximately 59 per cent. In the long term, Code E aircraft could represent 80 per cent of international ATM.

It is expected that the Airport will also serve Code F aircraft, with planning assuming approximately five weekly scheduled ATM initially, increasing to 35 weekly (or five daily) ATM around 2063.[12]

The freight aircraft fleet mix assumes the majority of dedicated domestic freight activity is served by Code C aircraft.[13]

2.1.5 Airfield

The airfield has been planned to achieve the following key characteristics:

- aerodrome reference aircraft up to and including Code 4F[14];
- runway 05/23 orientation;
- two parallel 3,700m long and 60m wide runways in the long term, with the first runway being the northern runway;
- 1,900m runway separation; and
- Category IIIB (CAT IIIB)[15] instrument approach for all four runway ends.

[12] Planning assumes there are no Code D aircraft that will operate at the Airport. Most Code D aircraft e.g. B767, A310, B757 are being phased out of passenger operations.
[13] International freight activity is generally expected to be served by larger Code E aircraft.
[14] ICAO Aerodrome Reference Codes refer to the size of airfield and the size of aircraft the airport has been designed to handle. Code 4F refers to Code number 4 for a reference field length of over 1800m and Code letter F for the largest category of aircraft: 65–80m wingspan and 14–16m outer main gear wheel span.
[15] Most major airports are equipped with Instrument Landing Systems (ILS), which allows a pilot to attempt to land safely at an airport in reduced visual conditions, such as fog. In these conditions the Runway Visual Range (RVR) system, which provides a measure of forward visibility along the runway centreline, becomes critically important and is used as one of the main criteria for minima on ILS approaches. ILS approaches typically require the installation of HIAL systems. Aircraft must also meet specific instrumentation and system requirements and flight crew must be certified for each category of ILS operations. At CAT I equipped airports, including at Brisbane and Canberra, aircraft must not descend below a decision height of 200 feet if the RVR

2.1.5.1 Aerodrome reference aircraft code

Airfield planning dimensions are dictated by the largest design aircraft that could use the Airport, termed the 'critical design aircraft'. The critical design aircraft establishes the critical separation and design geometry dimensions for safe manoeuvring operations of runways, taxiways and aprons.

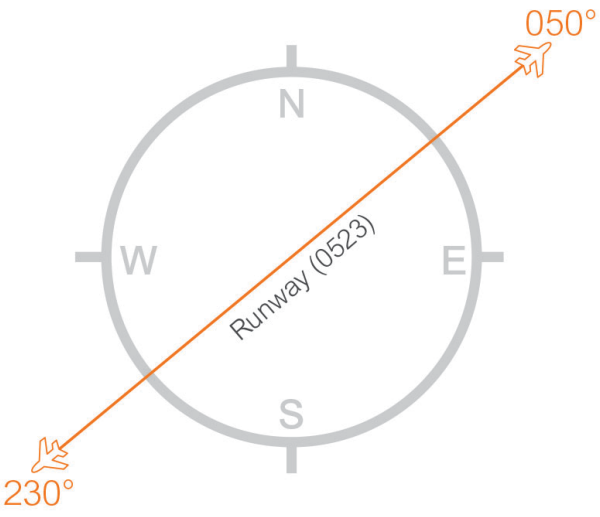
For Stage 1, Code F has been adopted as the critical design aircraft for the Airport[16]. This means that from the start of operations, the Airport will be able to accommodate all aircraft ranging from regional jets and turboprops (Codes B and C) up to the largest aircraft in operation today (e.g. Airbus 380), or known future aircraft planned to be built. Designing the Airport to a Code F standard from the beginning will mean the Airport could serve increasing Code F activity without disrupting operations, and provide an alternate Code F airport to Sydney Airport.

The critical reference aircraft could be reconsidered as the Airport expands and when a second runway is built at the Airport.

2.1.5.2 Runway orientation

The 05/23 widely spaced, parallel runway alignment was formalised in the 1985 *Second Sydney Airport Site Selection Programme* Preliminary Master Plan. Minimising aircraft noise impacts on surrounding communities was the primary determinant in selecting the runway alignment and site boundary. The 05/23 alignment, as shown in Figure 6, is assessed as having a lesser noise impact than a north–south alignment. Other factors affecting runway orientation include the shape of the site, terrain, weather and prevailing wind conditions.

Figure 6: Runway orientation



is less than 550 m. At CAT II equipped airports, including Sydney (Kingsford Smith) Airport, aircraft must not descend below a decision height of 200 feet if RVR is less than 350 m. At airports equipped with CAT IIIB, of which Melbourne Airport is the only Australian airport currently certified to this level, aircraft may descend below a decision height of 50 feet in weather conditions with as little as 50 m forward visibility.

[16] The Airport will apply Code F as the critical design aircraft for the airport, having regard to the objective of maximising the aeronautical capacity of the Airport in the long term, except in cases where a lower code of aircraft is more critical or Code F use can be demonstrated as not required.

In retaining the 05/23 alignment, current planning has sought to maximise the use of the Airport Site – increasing the scale of the infrastructure to accommodate potential long-term capacity – without requiring the acquisition of significant additional land.

The orientation of runways should be such that the usability factor of the airport is not less than 95 per cent for the aircraft that the airport is intended to serve.[17] The Bureau of Meteorology has assessed the usability of the Airport on the basis of meteorological conditions, including wind and fog. It is expected that a runway orientation of 05/23 would be usable for approximately 99.5 per cent of the time based on crosswinds. Other weather phenomena such as fog, low cloud and low-visibility conditions, may lower the usability of the Airport. However, mitigation is expected to be obtained through navigational systems and aids, such as the use of CAT IIIB instrumentation.

2.1.5.3 Number of runways

To meet the anticipated passenger and freight demand at the Airport in the long term, two parallel runways of equal length are proposed.[18]

The Stage 1 Development is expected to serve approximately 63,000 ATM on the first runway. This equals approximately 10 MAP. Following development of additional supporting infrastructure, at full capacity the first runway could operate at approximately 49 ATM per hour, or 185,000 ATM per year, and serve approximately 37 MAP.

The second runway could be required around 2050. In the long term, two runways are expected to be able to service approximately 85 ATM per hour, or 370,000 ATM per year, and serve approximately 82 MAP.

2.1.5.4 Runway construction priority

It is proposed to construct the northern runway and develop the northern half of the Airport Site first, for the following reasons:

- reduced earthworks requirements (cut and fill) associated with the northern runway;
- fewer constraints on accommodating rail services on the Airport Site;
- impacts on Airport Site biodiversity values would be avoided until required for future development; and
- shortest distance to connect utility trunk lines around the Airport Site.

While the northern runway is on the same assumed alignment outlined as Option A in the 1997–99 EIS[19], the southern runway would be located as far as possible to the south to maximise the

[17] ICAO Doc. 9157, Aerodrome Design Manual, Part I, Runways, 3rd Edition, 2006.
[18] Using the standard naming of runways to indicate their relationship left and right of each other, compass and the direction of movement, the northern runway is 05L-23R and the southern runway is 05R-23L.
[19] 1997-99 Environment Impact Statement – Second Sydney Airport prepared by PPK Environment and Infrastructure for Commonwealth Department of Transport and Regional Development.

midfield area and optimise the airport's aviation capacity, providing additional land for future terminal and support facilities and revenue producing commercial development.

This increases the potential runway separation on the Airport Site from the 1,670m as proposed in the 1997–99 EIS to about 1,900m (see below for further discussion of runway separation).

2.1.5.5 Runway length

Sufficient runway length is required to ensure that an aircraft can, after starting a take-off, either be brought safely to a stop after reaching a critical speed, or complete the take-off safely.

Based on the anticipated take-off performance of aircraft likely to use the Airport, a runway length of 3,700m is considered optimal. A 3,700m runway at the Airport would be able to serve all domestic destinations and international destinations up to a distance of 8,000 nautical miles, based on current aircraft performance.

Figure 7: Boeing 777-300ER indicative range with maximum take-off weight

Figure 7 shows that for critical aircraft, such as a Boeing 777-300ER aircraft (Code E), the Airport could serve international destinations, including Dubai and mid-west United States of America.[20]

[20] Runway length analysis was conducted using the (i) ICAO Doc. 9157, Aerodrome Design Manual, Part 1, Runways requirements; and (ii) Aircraft performance manuals published by aircraft manufacturers. Analysis was based on indicative runway altitude and slope, average maximum temperature conditions and aircraft maximum take-off weights as defined by aircraft manufacturers. The analysis highlights that, under comparable operation conditions, newer aircraft tend to use less runway length for take-off than the earlier generation of aircraft. This has been possible because of improved aerodynamic

In the long term, it is expected that both runways would be equal in length. This allows appropriate flexibility in assigning aircraft to flight paths and provides redundancy when one runway is out of service for maintenance or resurfacing.

2.1.5.6 Runway location, separation and thresholds

International standards require a minimum separation of 1,525m between runways to enable independent parallel arrival and departure operations in poor weather. It is normally desirable to make the separation wider, where possible, to maximise the land available between the runways for terminals, aprons and taxiways.[21]

A runway separation of approximately 1,900m at the Airport will ensure adequate midfield separation and services, including the airfield taxiway system, terminal/concourse buildings, aircraft stands and ground transport access to operate at approximately 82 MAP demand.

To meet the objective of maximising the aeronautical capacity and efficiency of the site, planning for the southern runway thresholds has positioned them parallel and squared to the northern runway.

Development of the Airport is expected to be based on the runway threshold coordinates and elevations set out in Table 3.

Table 3: Runway threshold coordinates and indicative runway elevation

RUNWAY END	EASTING	LATITUDE (SOUTH)	NORTHING	LONGITUDE (NORTH)	INDICATIVE ELEVATION (AHD[22])
Northern (first) runway					
05L	286914.0611	S033° 53’ 30.28”	6247443.7898	E150° 41’ 44.65”	93.09 m
23R	290067.1149	S033° 52’ 29.75”	6249379.8297	E150° 43’ 48.97”	73.22 m
Southern (second) runway					
05R	287916.7743	S033° 54’ 23.37”	6245829.8388	E150° 42’ 22.25”	85.16 m
23L	291069.8277	S033° 53’ 22.83”	6247765.8799	E150° 44’ 26.59”	72.21 m

efficiencies and efficient modern engines. The Airbus 340-600, Boeing 747-400 and 767-300ER require more than 3,700m runway length at maximum take–off weights, however these are being phased out of airline fleets. The Boeing 777-300ER and Airbus 330-300 require less runway length (under 3,700m) as does the Code F Boeing 747-8. The heaviest aircraft, the Code F Airbus 380-800 requires only 3,544m based on calculations using the operating conditions described above.

[21] ICAO Standards as prescribed in Doc. 9643, Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways.

[22] Australian Height Datum (AHD) is a measure in metres of elevation above mean sea level.

2.1.5.7 Runway Rapid Exit Taxiways

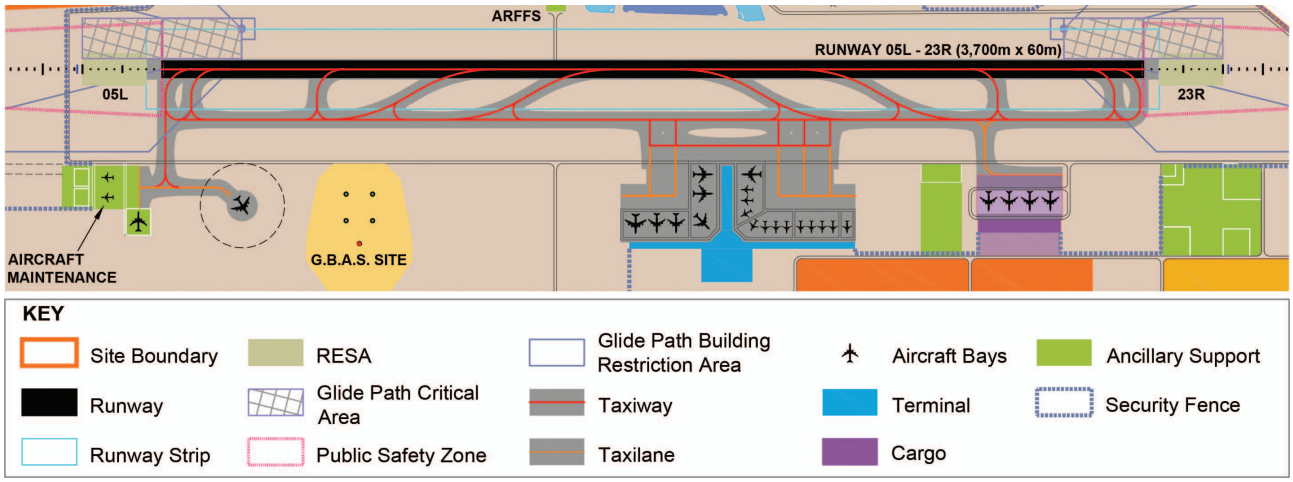
An arriving aircraft cannot touch down until the preceding aircraft has cleared the runway. To minimise the time an aircraft physically spends on a runway – aiding the efficient operation of the airport – RETs are optimally positioned and configured to support an airport's traffic mix.

Planning assumes the need for two RETs in each direction at 30 degrees to the runway on the terminal side of each runway and, in addition, two 90-degree exits, as shown in Figure 8. Actual requirements will be determined during detailed design.

2.1.5.8 Taxiways, taxilanes and aprons

Taxiways, taxilanes and aprons allow the safe and efficient movement of aircraft between the runways and terminals. As shown in Figure 8, only a single parallel taxiway will be required for at least the first two decades of the Airport's operation. For the longer term, full-length, dual parallel taxiways are planned on the terminal side of each runway. These dual taxiways will allow for two-way flow, provide bypass capability and provide space to sequence departing aircraft in the departure queue. This will increase the efficiency of airport operations and aid in maximising the departure capacity of the Airport.

Figure 8: Indicative Stage 1 runway layout



Sufficient separation on the apron is required to allow for safe manoeuvring of aircraft, including push back clear of taxiways on departure.

Various connector taxiways are planned to be located to provide easy and safe transition between the parallel taxiways and to discourage potential runway incursions by aircraft.

The northern airfield will preserve the ability for the future expansion to the long-term airfield development, including completing the second full-length parallel taxiway on the northern runway.

To avoid future congestion on the airfield, at least two sets of dual cross-field taxiways are expected to be required in the long term, providing efficient aircraft access from any gate to either runway. These taxiways will minimise aircraft taxi delays for the long-term airport by facilitating

transition between the runways and terminal aircraft stands and by providing two-way circulation capability between the northern and southern parts of the future airfield.

The taxiway system will be designed to provide sufficient queuing space for the departing aircraft and to provide bypass capability without blocking or impeding the flow of aircraft traffic on any portion of the airfield.

2.1.5.9 Aviation Rescue and Fire Fighting Services

The Airport will likely require one Aviation Rescue and Fire Fighting Services (ARFFS) station for each runway[23]. These are expected to be operated by Airservices Australia and are expected to be required as each runway is brought into operation. The stations are likely to be located as close to the centre of each runway as possible, on the outboard side, to ensure relevant response times can be met.

Onsite training facilities, including provision for retention and control of run-off, may also be required.

2.1.5.10 Navigational aids

The airfield will be equipped to accommodate instrument approach procedures at both ends, to improve the accuracy and reliability of navigational guidance to approaching aircraft, enabling them to land safely during periods of poor visibility. This equipment is expected to include an instrument landing system (ILS), HIAL and Ground Based Augmentation System (GBAS).

The navigational aids will be located in accordance with the relevant equipment siting guidelines. Protection zones would need to be provided to assure the continuous operation of the navigational aids, within which restrictions would be placed on building types, building heights and certain activities in order to avoid interference with the equipment.

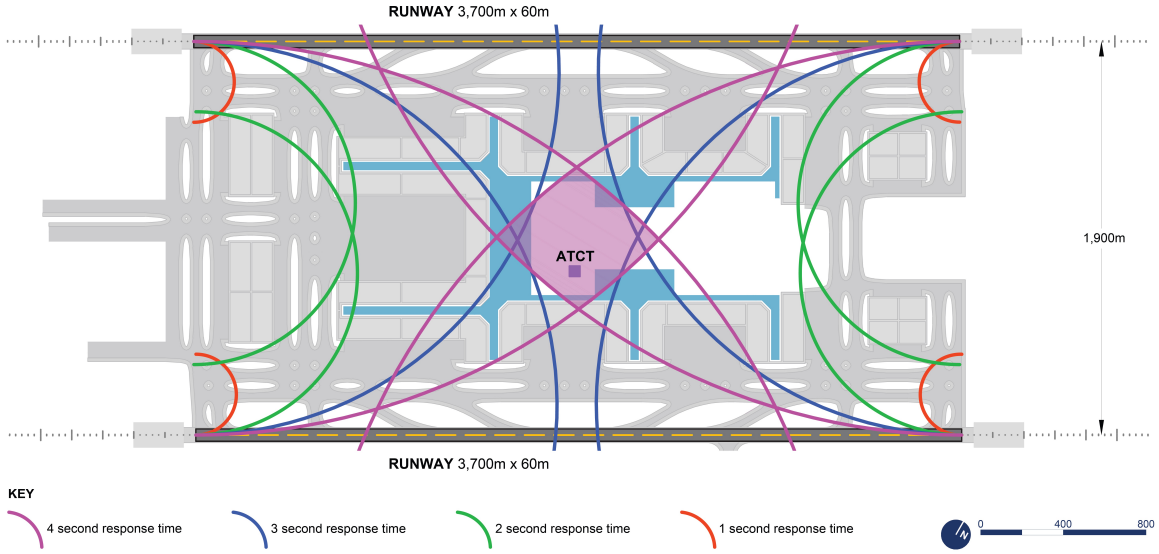
2.1.5.11 Air traffic control

The Airport will require air traffic control capability, which is currently expected to be delivered through an air traffic control tower (ATCT) operated by Airservices Australia. The method for delivering air traffic control capability will be settled as part of detailed design of the Airport.

Assuming an ATCT is used to provide air traffic control capability, the location of the ATCT should result in the shortest possible response time for the air traffic controller to detect the start of an aircraft's movement at take-off. The position of the ATCT should result in a response time of up to four seconds, with an upper limit of five seconds in exceptional circumstances. The only suitable location for the ATCT to be able to cover the entire long-term airfield within the required four-second response time is within the purple shaded area in Figure 9.

[23] Unless a central location for a single ARFFS station in the midfield that will adequately cover the response time for both runways is identified.

Figure 9: ATCT response time analysis



Based on the indicative airfield grading, estimated runway threshold coordinates and runway elevation plans, Table 4 shows an ATCT will need to be a minimum of 35 m in height (equating to a controller eye-level elevation of 115 m AHD) to provide a four-second response time.

Table 4: ATCT eye-level elevation

Threshold	Elevation (AHD)	Angle from horizontal	Distance from ATC	Required eye level elevation (AHD)
Northern runway				
05L	93.09 m	0'	2,149 m	114.97 m
23R	73.22 m	0'	2,165 m	95.26 m
Southern runway				
05R	85.16 m	0'	1,994 m	105.46 m
23L	72.21 m	0'	2,030 m	92.87 m

2.1.6 Terminal

The terminal precinct will be developed in the midfield area, between the two runways. This location is the most effective for high-capacity airports as it facilitates the best integration of landside operations, terminals and airfield.

Terminal facility requirements are planned to provide for kiosk, bag drop, security, emigration/ immigration (citizen, non-citizen and smart gates), baggage handling facilities, baggage claim and departure lounges, along with commercial tenant areas and back of house facilities. The estimated terminal space requirements based on the activity forecasts at the Airport (see section 2.1.4) are shown in Table 5.

Table 5: Indicative terminal space requirements

		Stage 1	Long Term
Indicative busy hour passengers[24]		3,300	18,700
Indicative integrated terminal size (in square metres)		65,000 - 90,000 m^2	689,000 m^2
Indicative kerbside length required (in metres)	*Departures*	185 m	755 m
	Arrivals	191 m	748 m

For comparison, the T3 terminal at Sydney Airport is 78,000 m^2.[25]

An integrated terminal[26] serving international and domestic/regional passengers is expected to be developed so the terminal precinct can evolve with passenger demand over time. An integrated terminal is more efficient because it allows the airport to 'swing' certain airport facilities, such as gates and sometimes check-in, security and baggage claim, which can be common to both domestic and international operations. This enables the total estimated terminal space requirement to be less than would be required with separate domestic and international terminals.

Swing facilities provide benefits to airlines and passengers, including increased flexibility to accommodate the up-gauging of domestic aircraft, sharing of passenger processing facilities by international and domestic passengers, increasing the efficiency of transfers and increasing the use of contact gates (equipped with aerobridge).

Stand requirements

The estimated passenger aircraft stand demand at the Airport used for planning purposes is set out in Table 6.

Table 6: Estimated stand demand

Passenger service stands[27]	Stage 1	Long Term
Domestic	14	50
International	5	101
Total	19	151

[24] Refers to overall busy hour passengers per day; separate busy hours for arrivals and departures may occur outside this period.
[25] Comprises approximately 54,000 m^2 terminal area 24,000 m^2 office and lounge space.
[26] In an integrated terminal, the common use circulation elements (such as check-in, security and baggage claim) are sized for the overall busy hour and not individually for the domestic and international busy hours, which do not completely overlap, resulting in redundancies in spatial requirements.
[27] A 10 per cent swing factor and 5 per cent out-of-service factor are assumed, e.g. for non-operating passenger boarding bridges, pavement maintenance and disabled aircraft at the stand. This is based on industry standards and benchmarks, current benchmarks at various Australian airports and the extent that international and domestic peaks coincide. This does not preclude the ability to swing facilities in excess of 10 per cent. Without applying a swing factor, the respective totals would be 21 and 166 stands. The number and mix of Code C, Code E and Code F stands will be determined during detailed design.

It is estimated that domestic stands at the Airport would have an average of 5.5 turns (i.e. combined arrival and departure operations) per stand per day. International stands would have an average of two turns per stand per day.

Stand dimensions

It is likely that some Code F stands would be developed as multiple aircraft ramp systems (MARS) capable. MARS stands provide maximum flexibility for airline allocation within the terminal, by permitting one stand to handle either two Code C aircraft or one Code F aircraft.

An appropriate mix of contact (aerobridge served) stands and non-contact (walk on/walk off) stands would be provided according to the nature and pricing of traffic (e.g. FSC versus LCC). In the long term, planning assumes that the Airport would be capable of serving 75 per cent of domestic passengers and 100 per cent of international passengers by aerobridge gates.

Car park

Estimated car parking requirements for the Airport are set out in Table 7. Planning assumes that car parking may be provided by a mixture of ground-level and multi-storey car parking facilities.

Table 7: Estimated car parking needs

Car parking	Stage 1		Long Term	
	Area (m^2)	Car parking spaces	Area (m^2)	Car parking spaces
Premium	115,000	2,300	1,750,000	35,000
Surface car parking spaces	276,000	9,200	1,050,000	35,000
Total	**391,000**	**11,500**	**2,800,000**	**70,000**

2.1.7 Aviation support facilities

To meet anticipated demand and operational needs at the Airport, support facilities for freight, aircraft and airport maintenance and catering have been identified, as well as ARFFS and an ATCT. Table 8 provides a summary of the indicative support facilities at the Airport.

Table 8: Summary of indicative support facilities and size needs

Facility	Stage 1	Long Term
Freight aircraft stands total	4	14
Support facilities (plot area m^2)		
Dedicated freight	65,000	436,000
Flight catering	6,700	38,000
Fuel farm	17,200	134,000
Airport maintenance	10,000	83,700
ATCT and base building	2,600	2,600
ARFFS stations	4,300	8,500
Aircraft maintenance	46,500	221,200

Freight

For planning purposes, Stage 1 annual freight is assumed to be approximately 220,000 tonnes. Of this, dedicated freight, from an estimated 7,000 ATM, comprises 157,000 tonnes, requiring at least four cargo stand positions. Belly freight (transported in the hold of passenger aircraft) comprises 63,000 tonnes.

Long-term freight is expected to be approximately 1.8 million tonnes per annum (0.8 million tonnes dedicated and one million tonnes belly freight). This is expected to require 14 stand positions and a dedicated freight precinct and taxiway system with aircraft access from the main parallel taxiway network.

The Stage 1 freight buildings and aircraft stands may be located closer to the terminal, with access via a dedicated northern entry point (see 2.1.9.3). In the long term, ground transport access for freight and maintenance vehicles, is planned from a realigned The Northern Road.

Aircraft maintenance

It is expected that functions, such as aircraft maintenance checks, aircraft washing bays and an engine run-up enclosure facility, will be required at the Airport. The aircraft maintenance facility requirements will be determined by the individual airlines operating at the Airport.

Catering

Planning provides for flight catering on site. However, a flight catering facility may be operated on or off the Airport Site.

General aviation

Depending on demand, the Airport may include facilities for general aviation, corporate aviation, emergency services and helicopters. As yet, no plans have been identified for such services.

If these types of facilities are provided in due course, they may be located in the south-west section of the Airport (near the possible location for Airport Maintenance on the indicative Airport layout – see Figure 2), and access to this area would be from the relocated The Northern Road. However, the location would be a matter for the ALC provided it complies with the Land Use Plan and relevant approvals.

2.1.8 Utilities

The onsite utility requirements identified to meet anticipated demand and operational requirements at the Airport are set out in Table 9.

Table 9: Summary of indicative utility needs

Utility	Indicative requirement Stage 1	Indicative requirement Long Term
Water (potable)	Average day demand 1.6 Megalitres per day (ML/d) Maximum day demand 3 ML/d	Average day demand 8.9 ML/d Maximum day demand 17.5 ML/d
Recycled water	Average day demand 1.8 ML/d Maximum day demand 3.5 ML/d	Average day demand 10.8 ML/d Maximum day demand 21.4 ML/d
Wastewater	Average daily treatment volume 2.7 ML/d Irrigation Volume 0.72 ML/d	Average daily treatment volume 15.4 ML/d Irrigation Volume 3.86 ML/d
Electricity	Maximum demand 16.7 MVA	Maximum demand 106.9 MVA
Gas	57,000 gigajoules (GJ) per year	449,000 GJ per year
Jet fuel	2.7ML/d; or 8.1ML representing three days demand	22ML/d; or 66ML representing three days demand
Communications	Dual access optic fibre via communications rooms Mobile phone transmitters (as needed for network coverage) Wireless (Wi-Fi) transmitters	Optical fibre loop and associated fibre access points around terminal building Mobile phone transmitters (as needed for network coverage) Wi-Fi transmitters

For the Stage 1 Development, jet fuel supply is expected to be delivered by road tanker in a similar way to other airports operating at this scale, for example Canberra International Airport and Gold Coast Airport. The fuel farm is expected to be accessible directly from Anton Road via Adams Road.

At a point in the Airport's development when it is economically viable to do so, or when supply by road becomes unfeasible, the fuel farm is expected to be supplied by a designated pipeline from a primary source. This approach to fuel supply is consistent with airports of a similar size around Australia.

Fuel will be transferred from the fuel farm to the terminal apron by underground pipe and reticulated to aircraft stands via a network of refuelling hydrants. Where refuelling of aircraft is incompatible with a hydrant delivery system, there may be provision for refuelling to be carried out by specific tankers on the apron. In such instances, delivery tankers will be filled from designated airside tanker delivery hydrants.

2.1.9 Ground transport

2.1.9.1 The Western Sydney Infrastructure Plan

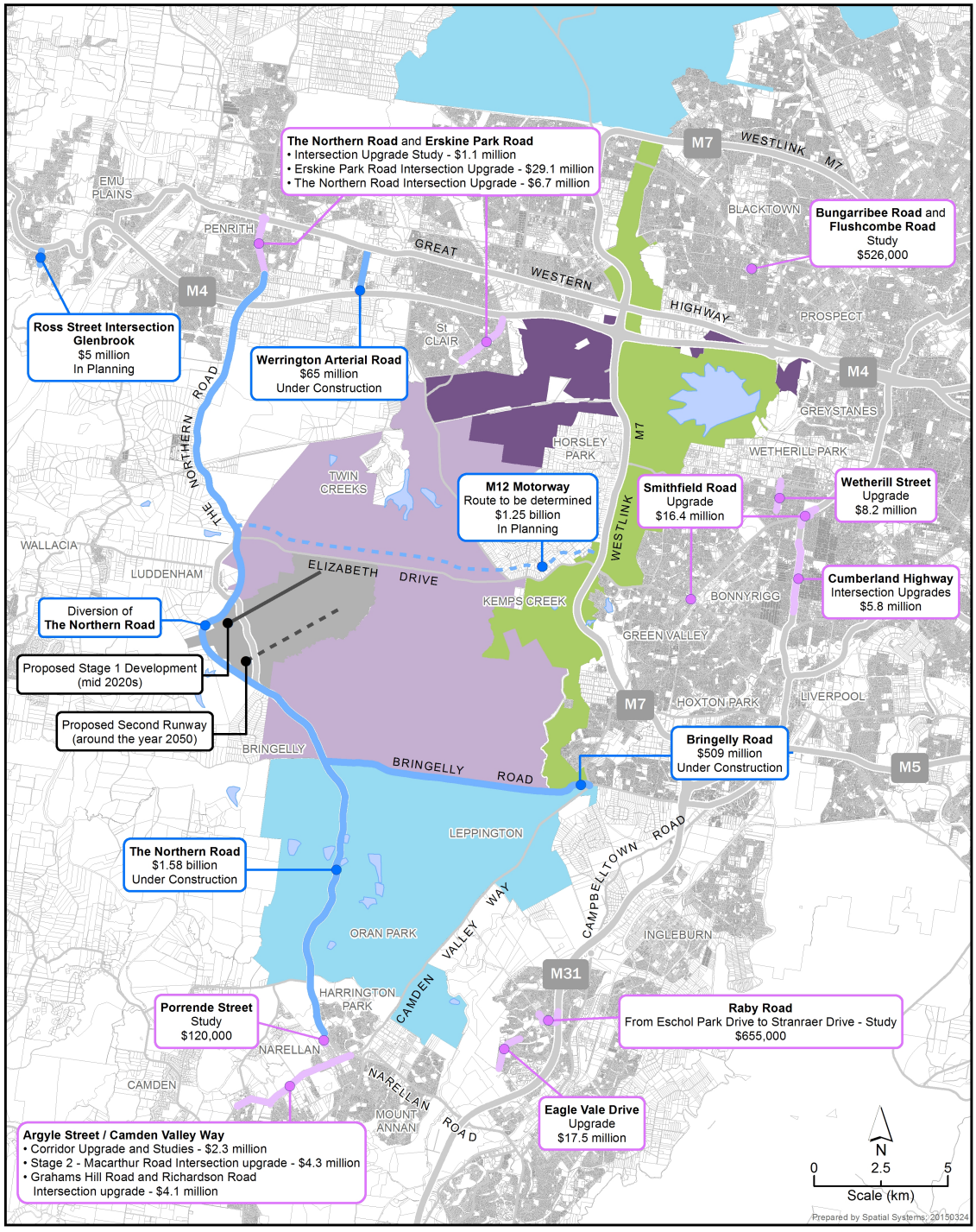
A new airport cannot operate in isolation from the community it serves and will need to be supported by a quality surface transport network to ensure the efficient movement of passengers, employees and freight. Road upgrades will provide better road linkages within the Western Sydney region and benefit the region's growing population, including through reducing commuting times.

The Australian and NSW governments have committed $3.6 billion over 10 years in major road infrastructure upgrades in Western Sydney.

These upgrades, including the new M12 motorway and relocating The Northern Road around Luddenham and the Airport, will relieve pressure on existing infrastructure and provide connectivity to the Airport before operations commence. In addition, they will amplify the economic gains from developing the Airport by improving connectivity for Western Sydney and beyond.

The projects that currently comprise the Western Sydney Infrastructure Plan (WSIP) are shown in Figure 10. The two first rounds of projects under the $200 million Local Roads Package have been announced and are underway. A further two rounds will be conducted from 2019-2020 to 2023-2024.

Figure 10: Western Sydney Infrastructure Plan



Map last updated: 25AUG16

Legend

- Western Sydney Infrastructure Plan Projects
- Local Roads Package Rounds 1 and 2
- Western Sydney Parklands
- Western Sydney Employment Area
- Western Sydney Priority Growth Area
- North West & South West Priority Land Release Areas
- Western Sydney Airport Site

2.1.9.2 Ground transport demand

Based on the forecast annual passengers (section 2.1.4) and the anticipated growth in demand for busy hour access to the Airport, travel demand estimates have been used to identify the anticipated development stages for ground transport infrastructure at the Airport.

In the first five years, the Airport is expected to generate up to approximately 43,000 trips in total per day by passengers and staff (not including traffic generated by any onsite commercial areas developed in addition to the Stage 1 Development). The majority of passengers are expected to arrive at the airport by car; either by quick drop-off (approximately 30 per cent), park and fly (approximately 35 per cent) or taxi (approximately 20 per cent).

By around 2063, the Airport is expected to generate more than 222,000 trips per day by passengers and staff. In the long term, it is expected that most passengers and staff would arrive at the airport by either car or train, with approximately 20 per cent of passengers choosing to use train. Road access plans and rail connection to the Airport are discussed in the following sections.

2.1.9.3 Road access

Main airport access roadways

The main access to the Airport Site will be from the north via a link to the M12 Motorway, which is planned to be completed and operational prior to the commencement of airport operations. The M12 is expected to predominantly run parallel with Elizabeth Drive. The proposed access corridor within the Airport Site is approximately 100 m wide, with capacity for six traffic lanes, two bus lanes and a rail reserve. The proposed entrance to the Airport is planned to provide capacity to operate at approximately 5,100 vehicles per hour in each direction.

Access to the Airport Site from the south-west will be via The Northern Road, which will be relocated off-site from its current alignment, upgraded and completed before the start of airport operations. This access point is anticipated to provide secure access to commercial and operational support areas, including freight and maintenance in the long term. This access road is expected to consist of a 50 m wide corridor allowing four trafficable lanes.

Off-airport secondary roadways

Anton Road and Adams Road connect to Elizabeth Drive and will provide secure operational access from the north-west to airport support areas, including the fuel farm and ARFFS station. These are currently local roads, which will need to be upgraded to a standard capable of supporting the expected number and load-bearing capacity of heavy vehicles anticipated to use this access route.

Badgerys Creek Road is expected to remain a public road to the boundary of the Airport Site. On the Airport Site, Badgerys Creek Road and other adjoining roads, including Pitt Street to Badgerys Creek, may remain open to public transport and/or public traffic prior to the construction of the second (southern) runway or the development of the southern commercial zone. It is not envisaged that Badgerys Creek Road would be used for freight or public access in the long term.

The indicative Stage 1 layout (Figure 2) provides for roads to run parallel on either side of the main airport access roadway, connecting the proposed location for a business park and aviation support activities to Elizabeth Drive and, potentially, Badgerys Creek Road. Such secondary roads would provide access to the main commercial areas and be developed as needed.

2.1.9.4 Rail access

Rail services will need to be provided at the Airport at the right time in its development. While the analysis to date has indicated that the $3.6 billion package of roads upgrades under the WSIP would be adequate to support anticipated airport demand for at least a decade after opening, the Australian Government recognises that rail could provide a benefit not only to passengers and employees using the Airport, but also to the broader Western Sydney Region.

Passengers arriving and departing the Airport Site will use various modes of travel. Rail services are expected to be required as part of a multi-modal transport solution by the time the airport reaches 30 MAP, estimated to be in the mid-2040s.

Sydney Airport, with 39.8 MAP, attracts around 15–20 per cent of its passengers using rail services to access the Airport and, depending on the attractiveness of rail to Western Sydney Airport passengers (transit time, cost and ease of access), it is reasonable to expect rail to attract similar percentages in the immediate term. These figures are consistent with international experience that indicates a global average of 20 per cent rail mode share for airports with a well-connected airport rail link, where people are already accustomed to using public transport.[28]

Initial rail services are expected to be provided to the Airport through the extension of the existing Sydney metropolitan rail network. In the longer term, the Airport is expected to also be serviced by a dedicated airport express rail service from a key transport hub in the Sydney basin.

Access for rail across the Airport Site and for one or more stations in the terminal precinct will be preserved. Planning assumes that the rail line could be predominantly underground through the Airport Site to avoid critical infrastructure and will be consistent with the aviation layout and staging of the airport development while optimising ease of access for passengers.

The Australian Government is working with the NSW Government on the joint Scoping Study of Rail Needs for Western Sydney (Scoping Study). The Scoping Study will assess the economic, population and commercial drivers for different rail connections, travel speeds and service types in the region in order to define the preferred need, timing and service options for rail investment to service Western Sydney and the Airport. The Scoping Study will also assess what it would take for rail to be operational at the Airport when it opens or, if not, how soon afterwards.

Subject to the findings of the Scoping Study, a final rail alignment will be determined in consultation with the NSW Government. Depending on the alignment and preferred timing to develop rail services, work may be required during the Stage 1 Development to either commence construction

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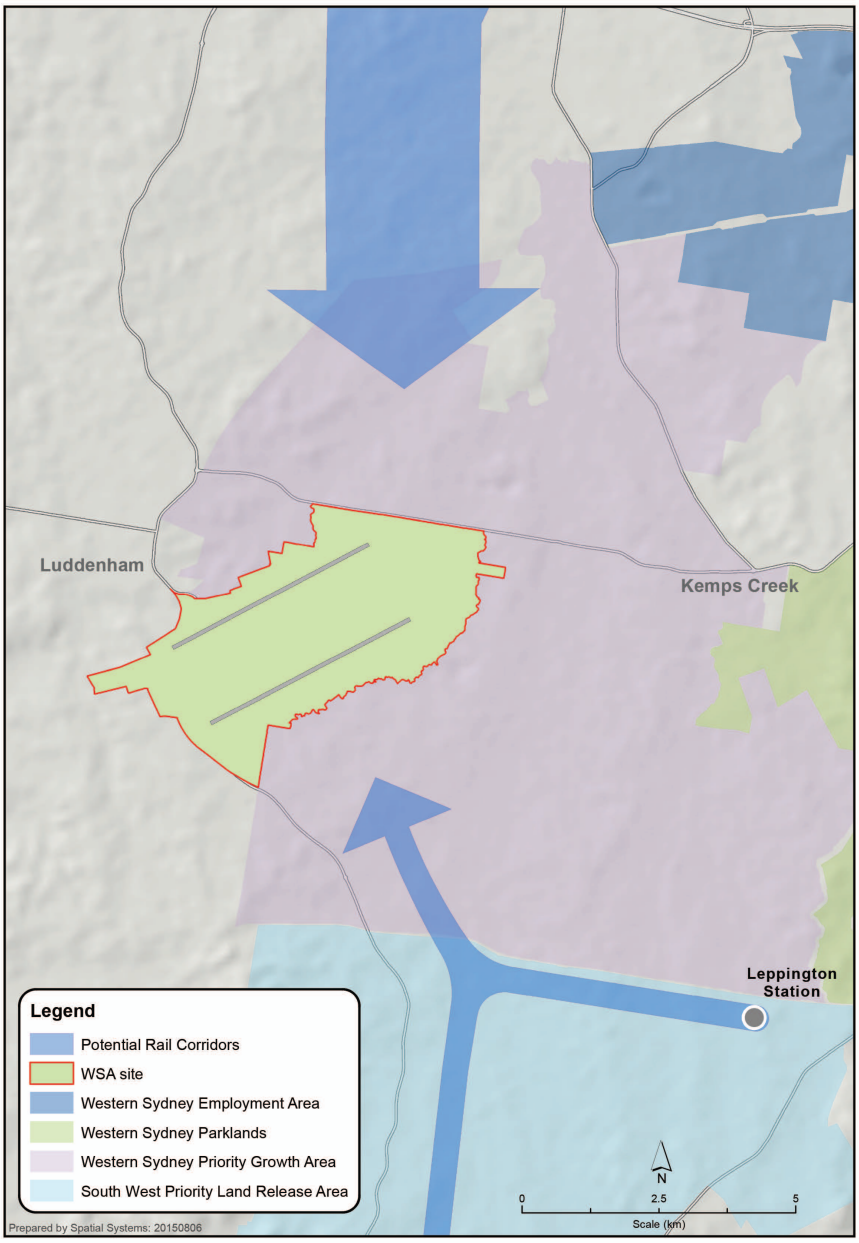
[28] Transport Associates Pty Ltd, presentation to IARO Meeting, Washington DC, 19 October 2015 - www.transportationassociates.com.au

or to future-proof the corridor. Any significant work is expected to require a variation to this Airport Plan.

Figure 11 broadly indicates how the proposed corridors for the South West Rail Link Extension could approach the Airport Site if that is identified as the preferred connection for rail to the Airport Site.

Figure 11: Potential rail alignments



2.2 Airspace management and flight paths

2.2.1 Airspace design

The formal flight path design for the Airport will seek to optimise safety, efficiency, noise and environmental impacts. This process for airspace design, finalisation and implementation is discussed at 2.2.5 Future Airspace Design.

2.2.2 Preliminary airspace management analysis

Airservices Australia assessed the implications for airspace and air traffic management approaches for Sydney basin airspace arising from an airport at Badgerys Creek.[29] The principal objective was to establish whether safe and efficient operations could be introduced at the Airport, through developing indicative proof-of-concept air traffic management designs. Importantly, this work does not present a comprehensive airspace and air route design, nor does it consider all of the essential components that would be necessary to implement an air traffic management plan for the Sydney basin as a whole.

Airservices Australia's analysis indicates there are no apparent physical impediments that would prevent safe and efficient operations for aircraft arriving at or departing from the Airport. Indicative approach and departure routes demonstrate that the Airport and Sydney Airport could operate independently as high capacity airports. Modelling demonstrates that, with parallel runways, the Airport could potentially achieve rates of around 103 ATM per hour without constraining Sydney Airport's 80 ATM per hour limit.

Airservices Australia's report confirms the operational viability of the Airport with both a single and parallel runway orientation of 05/23.

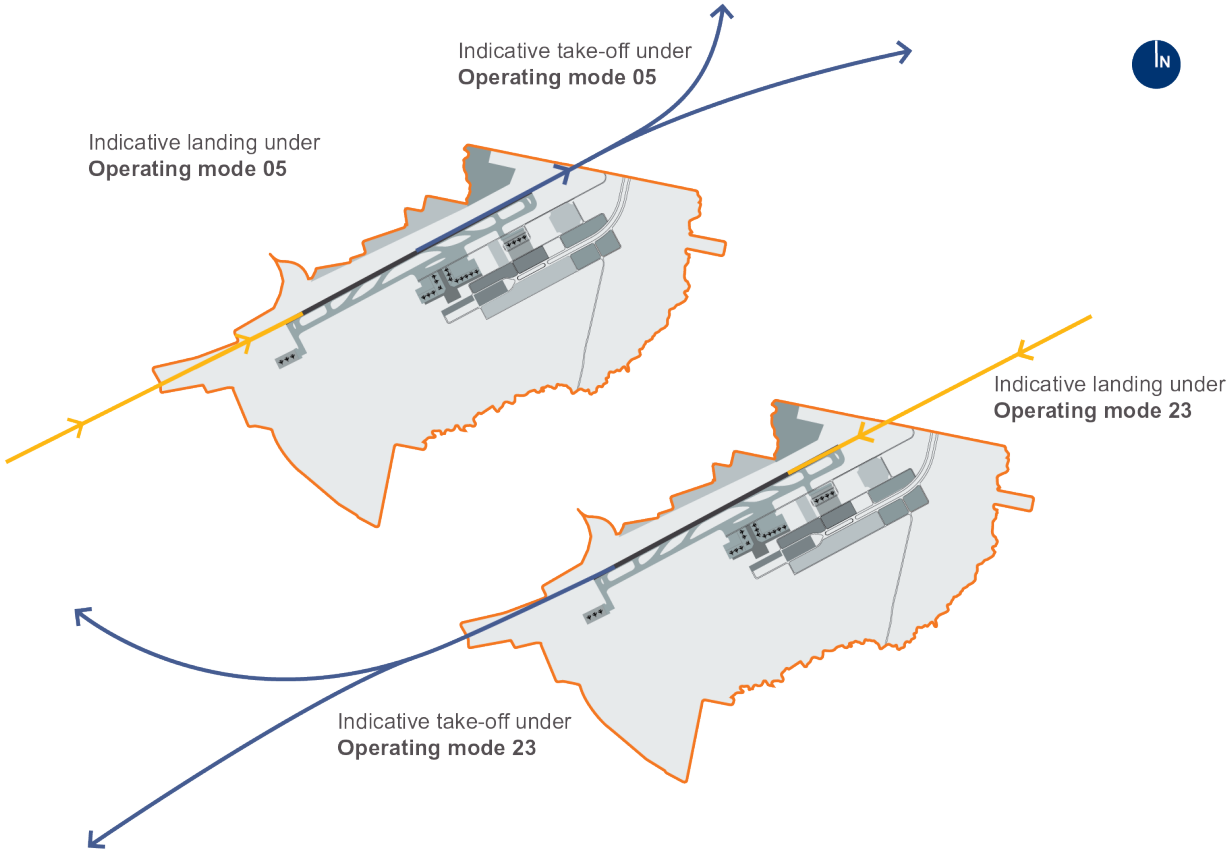
2.2.3 Runway modes of Operation

Runway modes of operation determine how an airport's runway system is used and refer to the direction in which aircraft take off and land. Operating modes are informed by assessing runway orientation and availability against factors, such as forecast meteorological conditions (especially wind direction and strength), aircraft profile and capability, demand and traffic volumes, airspace management procedures, and potential impacts on surrounding communities, such as noise.

As shown in Figure 12, there are two main operating modes available at the Airport during single runway operations: departures and arrivals in a south-west direction; departures and arrivals in a north-east direction.

[29] Western Sydney Airport – Preliminary airspace management analysis – Final report, Airservices Australia, April 2015.

Figure 12: Arrival and departure modes for 05L and 23R[30]



To manage noise impacts, a third operating mode, 'head-to-head' (also known as reciprocal runway operations) will be thouroughly evaluated through further detailed assessment to determine the preference for such an operating mode prior to commencement of operations. Under this mode all aircraft arrivals and departures would effectively occur, using only one end of the airport site for a period of time and therefore offer a period of no aircraft operations for other areas during that time. This would involve all landings and take-off movements occurring in opposing directions and safely sequenced either to or from the south west; or to or from the north east.[31]

A head-to-head operating mode could be used when it is safe to do so and specifically when:

- the number of arriving and departing aircraft is not more than 20 ATM per hour to permit the safe separation of aircraft; and

[30] Aircraft on final approach to the airport are on straight line descent to the runway from 10 nautical miles (18.52 km).
[31] Head to head operating modes form a key part of night time noise abatement procedures at Brisbane and Sydney Airports. At Sydney, head to head departures and arrivals over Botany Bay are mandated by curfew requirements.
At Brisbane Airport, head to head departures and arrivals over Moreton Bay are the preferred operating mode under night time noise abatement procedures. Ongoing aircraft noise monitoring at Brisbane indicates that the preferred over-water head to head operating mode can be used for an average of over 80 per cent of night-time take-offs and landings – Quarterly Brisbane Noise Information Reports, Airservices Australia.

- the weather conditions (principally a dry runway and light downwind component) mean that it is safe to take off or land.

Wide-spaced parallel runways expand the range of possible runway modes of operation to include simultaneous opposite direction parallel runway operations (similar to head-to-head operations; for example, departures to the north-east on one runway with arrivals from the north-east on the other).

Note that other operating modes for single and parallel runways may also be possible, depending on the factors outlined above.

2.2.4 Indicative flight paths

Indicative flight paths for Stage 1 (single runway) and long-term (parallel runway) operations at the Airport, based on Airservices Australia's preliminary airspace management analysis, were shown in the draft Airport Plan and draft EIS. Final airspace and air route planning for the proposed airport will assess different systems for sequencing arriving aircraft and alternative flight path options. This future airspace planning and design will evaluate each system and flight path option against the key criteria of safety, aircraft operation efficiency, capacity, and noise and other environmental impacts.

The main consideration when designing the indicative flight paths presented in the draft EIS was air traffic management, particularly how aircraft using the flight paths would interact with aircraft operating to and from Sydney Airport. The indicative flight paths developed by Airservices Australia were designed on the premise that the proposed airport would operate independently of Sydney Airport in all cases. This ensures the selection of runways or operating modes at one airport could be made to suit local conditions without affecting the operating mode at the other.

A feature of the indicative flight path design depicted in the draft Airport Plan and draft EIS was a conceptual model for aircraft arrivals, for the 05 and 23 operating modes respectively.

The point merge system is operational in several European and Asian locations. Developed over the last decade, it is an innovative method of processing arriving aircraft in high-traffic areas by synchronising them to the runway in a structured manner over a common merge point. Point merge provides a simple, predictable and standardised procedure for sequencing aircraft arrivals using the capabilities of an aircraft's on-board flight management system. Point merge promotes the use of a continuous descent path, which can potentially offer economies in fuel use and efficiency (e.g. through minimising track miles) and can reduce noise impacts compared to alternative arrival management systems that involve more air traffic control intervention. It may also provide the easiest and most flexible method for ensuring fully independent operations can occur at the proposed Western Sydney Airport and Sydney (Kingsford Smith) Airport.

Flight paths have not been finalised. The Australian Government has announced that the airspace design to be implemented for the proposed Western Sydney Airport will not converge arriving aircraft at a single point over the community over Blaxland.

2.2.5 Future airspace design

The preliminary airspace design prepared by Airservices Australia is conceptual and represents one of several options for managing air traffic at the Airport, requiring further detailed consideration before air traffic arrangements are determined.

Designing air traffic management arrangements for a new runway or airport is a large, resource intensive and complex technical task that takes several years to complete. While a standard process can be applied to airspace design across Australia, each airport is unique in terms of its air traffic and user requirements, fleet mix, operating constraints, environmental context and geographic relationship to surrounding communities.

The detailed airspace and flight path design for the proposed airport will apply international best practice for managing airspace design.

The Department of Infrastructure and Regional Development will be responsible for delivering the flight path design for the proposed airport, working in close collaboration with Airservices Australia and CASA. The proposed airspace design arrangements will be formally referred under the EPBC Act. CASA would ultimately approve the proposed airspace management arrangements, including the final flight paths, before the commencement of operations.

Airservices Australia will undertake a comprehensive airspace planning and design process for single runway airport operations. This process will allow the final airspace arrangements to better reflect the operating environment closer to the time the airport opens, taking account of factors such as new aviation technology and environmental impacts.

The flight path design process will optimise flight paths on the basis of safety, efficiency, capacity, and noise and environmental considerations, while minimising changes to existing airspace arrangements in the Sydney basin. The use of relatively new satellite-based navigation technologies at the proposed airport will provide greater flexibility in planning flight paths and will allow a larger range of options to be considered for managing noise from both night and daytime operations.

Extensive community and stakeholder engagement will occur throughout the planning and design phases of the flight path design process, which commences following the determination of this Airport Plan.

Table 10 summarises the phases, activities and outputs of the formal airspace and flight path design process. Table 10 also shows the proposed timing for the different stages of the process.

Table 10: Airspace and flight path design process

Phase	Key activities	Key outcomes	Timing
Planning	• Establish expert steering group • Collect stakeholder views on system requirements, including community and environmental inputs • Confirm Sydney basin airspace and air route requirements and constraints • Establish community and stakeholder reference group • Develop and undertake a preliminary environmental assessment of airspace concept options (i.e. standard arrival and departure routes)	• Consultation conducted with interested parties, including regulatory authorities, government agencies, airlines, other Sydney basin aerodrome operators and airspace users, and the community • Review of airspace concept options and potential noise abatement procedures including identification of a preferred high-level airspace concept option	Approx. 2 years starting from determination of the Airport Plan
Preliminary design and environmental assessment	• Evaluate the preliminary airspace design	• Preferred airspace design concept	Approx. 1 year
	• Refer preferred airspace design to the Environment Minister under the EPBC Act • Prepare and submit any formal environmental assessment documentation required by the Environment Minister • Public exhibition and community consultation • Policy on property acquisition and noise insulation announced		Approx. 2 years (c.2019–2021)
Detailed design	• Evaluate, validate and refine the detailed design taking account of the EPBC Act process	• Final airspace design and noise abatement procedures for implementation • Long-term ANEF chart	Approx. 1 year
Implementation	• Notify airspace and air route changes	• Airspace change proposal approved by CASA	Approx. 2 years
		• Commencement of air operations at WSA in accordance with specific noise abatement procedures identified in the airspace design process	Mid-2020s

2.2.6 Airspace protection

Protecting immediate airspace around airports is essential to ensuring and maintaining a safe operating environment and to provide for future growth. Obstructions in the vicinity of an airport, such as tall structures and exhaust plumes from chimney stacks, have the potential to create air safety hazards and to seriously limit the scope of aviation operations into and out of an airport. The most critical areas of concern are the immediate approach and take-off areas.

Prescribed airspace is established under ICAO guidelines in response to the mix of aircraft and patterns of operations at an airport. Under Part 12 of the Act and the Airspace Protection Regulations, the airspace around the Airport will be protected in the interests of the safety, efficiency and regularity of future air transport operations. Activities, such as constructing buildings that intrude into prescribed airspace are identified as controlled activities and cannot be carried out without approval under the Airspace Protection Regulations.

The airspace protection measures are described in terms of airspace surfaces at varying altitudes around the Airport, and include:

- Obstacle Limitation Surfaces (OLS);
- Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) Surfaces; and
- Protection of other surfaces around navigational aids.

Obstacle Limitation Surfaces

The OLS for the long-term layout at the Airport, as shown in Figure 13 and Tables 11 and 12, will be protected under the Airports (Protection of Airspace) Regulations 1996.

The OLS is the protection for aircraft operating on visual flight procedures. It is a series of virtual surfaces around a runway, which establish the height limits for objects in and around an airport. It identifies the lower limits of an airport's airspace, which should be kept free of obstacles that may endanger aircraft during take-off, preparation to land and landing. During these stages the pilot must be able to maintain visibility of the airport to take responsibility for obstacle avoidance and separation from other aircraft.

OLS requirements depend on the length of the runways and type of approach. The OLS includes a series of surfaces radiating out from each runway and increasing in height.

The OLS serves as a first filter for assessing the operational impact of an obstacle. Subject to an operational assessment of surveyed surrounding terrain and obstacles (see Obstruction analysis below), an obstacle may need to be lowered or removed; or it may be adequate for the obstacle to be marked and/or lit and noted in aeronautical publications.

Figure 13: OLS for Western Sydney Airport for the protection of future air transport operations

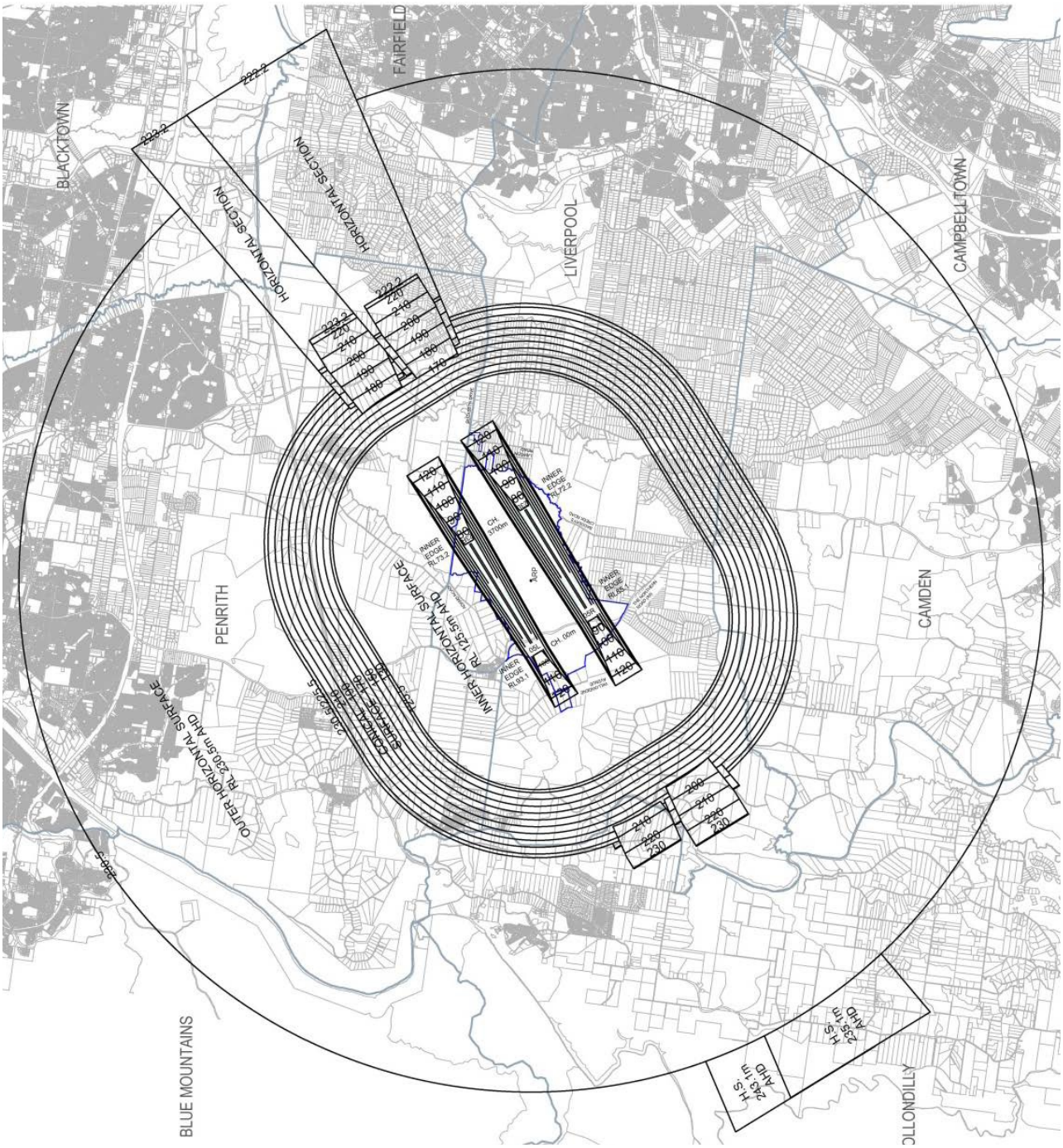


Table 11: OLS approach surfaces – Instrument Precision Cat III Aerodrome Reference Code 4 (Figure 13)

RUNWAY	Origin change (m)	Height (m)	Inner edge width (m)	Divergence (%)	Slope (%)	Length (m)	Section
05L	0	93.1	300	15	2	3,000	First
					2.5	3,600	Second
					0	8,400	Third
23R	3,700	73.2	300	15	2	3,000	First
					2.5	3,600	Second
					0	8,400	Third
05R	0	85.1	300	15	2	3,000	First
					2.5	3,600	Second
					0	8,400	Third
23L	3,700	72.2	300	15	2	3,000	First
					2.5	3,600	Second
					0	8,400	Third

Table 12: OLS take-off surfaces – Aerodrome Reference Code 4 (Figure 13)

RUNWAY	Origin change (m)	Height (m)	Inner edge width (m)	Divergence (%)	Slope (%)	Length (m)	Section
05L	3,700	73.2	180	12.5	2	15,00	1,800
23R	0	93.1	180	12.5	2	15,000	1,800
05L	3,700	72.2	180	12.5	2	15,000	1,800
23R	0	85.1	180	12.5	2	15,000	1,800

Notes:

- Aerodrome Reference Code 4 refers to the size of airfield the airport has been designed to handle – a Code-4 field is a length of over 1800 m.
- Reference elevation datum adopted – 80.5 m AHD.
- Transitional surface – 14.3 per cent.
- Inner horizontal surface – radius 4,000 m, height 45 m above level datum.
- Conical surface – slope 5 per cent to 100 m above inner horizontal surface.
- Outer horizontal surface – radius 15,000 m height, 150m above level datum.
- 1.6 per cent take-off surface in accordance with Table 7.1-2 in the MOS.

Obstruction analysis

It is important to note that the OLS does not prohibit all intrusions; rather, the aim is to ensure that all objects that intrude into the OLS can be identified and assessed for their potential impact on aircraft operations.

A survey of potential obstructions in the vicinity of the Airport has been undertaken. Vegetation close to the runway, such as tall trees, will require assessment and may need to be removed or lowered. Height limitations may also apply to airport buildings, street lighting and signage.

A preliminary analysis of terrain around the Airport confirmed the Blue Mountains escarpment encroaches into the OLS airspace to the north-west of the Airport Site to varying extents, ranging from 0.6 m up to 95 m in some places. This will need to be accommodated in the concept of aviation operations as part of the future airspace concept development process.

Other potential encroachments in the area include various mobile telephone towers and power transmission lines. The TransGrid 330 kilovolt (kV) transmission line that currently crosses the Airport Site will be relocated either along a new corridor below the OLS or underground.

Air turbulence due to vertical exhaust plumes from chimney stacks may pose a hazard to aviation. This may be controlled under the Airspace Protection Regulations, subject to a plume rise assessment. This would determine any potential impacts from plumes in the vicinity of the Airport before the start of operations.

Procedures for Air Navigation Services – Aircraft Operations

At major airports, radio navigation aids and satellite navigation enable aircraft to operate in poor weather conditions including, cloud and fog. The PANS-OPS protected surfaces for aircraft operating under these non-visual (instrument guided) conditions are generally located above the OLS. Separate procedures are designed for each runway and for the type of navigation system being used and the multiple surfaces are combined to form the PANS-OPS.

Obstacles cannot be permitted into the PANS-OPS. If an obstacle were within the area of the PANS-OPS, the published approach or departure procedure would need to be withdrawn and redesigned to ensure safe operation of aircraft.

Calculating PANS-OPS surfaces is complex because of the highly technical nature of the design and interaction of procedures. The design of a full set of PANS-OPS for Stage 1 and long-term operations will be required following the formal flight path design before the start of operations. Once designed, the PANS-OPS will be protected under the Airspace Protection Regulations.

Protection of other surfaces around navigational aids

Other safety-critical surfaces are expected to be defined and protected to prevent interference to, or distortion of, signals from ground-based air navigation equipment.

The indicative airport layouts set out in Figures 2 and 4 allow for all other necessary onsite protections as currently envisaged.

2.2.7 National Airports Safeguarding Framework

Land use planning and management is an effective means to ensure that the activities both on and off airports are compatible with aviation. The development of the Airport will be consistent with the principles and guidelines of the National Airports Safeguarding Framework (NASF).

NASF is a national land use planning framework applied by each state that aims to improve safety by ensuring aviation safety requirements are recognised in land use planning decisions.[32] In addition to managing protected airspace intrusion, the NASF addresses building-generated windshear and turbulence, wildlife airport buffers to prevent bird strike, lighting restrictions to prevent pilot distraction, and wind turbine risks.

Importantly, the NASF also covers noise from aviation activity (see section 2.3). Planning protections covering public safety zones (PSZ) and off-airport impacts on communications, navigation, surveillance / air traffic management (CNS/ATM) may be included in the NASF in due course.

Windshear and turbulence

The shape, height and arrangement of buildings in relatively close proximity to a runway may adversely affect safe aircraft movement on runway operations. All proposed airport development will need to be assessed for its potential windshear and turbulence effects.

Wildlife airport buffer

The ALC will need to work with local authorities to develop a wildlife hazard management program to control the risk of wildlife hazards on and near the Airport.

The program may include recommendations for the location and management of waste facilities in the vicinity of the Airport Site, or the netting of standing water features, such as detention basins to deter birds. For example, rubbish dumps within 13 km of the Airport will require monitoring and potential mitigation based on the capacity to attract wildlife giving rise to bird hazards. The ALC will need to conduct ongoing consultation with local agencies, such as national/state wildlife and parks management and wetlands management agencies, on land uses of concern.

Restrictions to lighting

CASA has the authority to determine the potential impact of surrounding ground lighting on pilots during take-off and landing operations and to control ground lights where they have the potential to cause confusion or distraction from glare to pilots within a 6 km radius of an airport.

As with safety-critical surfaces, lighting restrictions in the vicinity of the Airport will be defined to prevent impacts on safe aircraft navigation.

[32] https://infrastructure.gov.au/aviation/environmental/airport_safeguarding/nasf/.

Public safety zones

The Australian Government is working with the state and territory governments on the development of a guideline for PSZ to be added to the NASF and incorporated into state and local government planning schemes.

PSZ are areas of land at the ends of runways, within which development may be restricted in order to control the number of people on the ground at risk of injury or death in the event of an aircraft accident on take-off or landing. While Australia has an excellent aviation safety record, there will always be some risk associated with flying and operation of aircraft at or around airports. The use of PSZ can further reduce the already low risk of an air transport accident affecting people near airport runways.

While there is no current ICAO standard for PSZ, some jurisdictions, such as Queensland, already have in place planning guidelines or policies that consider these risks. In the absence of any nationally agreed guidance, a nominal 1,000m, trapezoid-shaped clearance off the end of each runway threshold is identified in the indicative layouts at Figures 2 and 4 to cover the area of highest safety risk.

2.3 Noise contours and noise management

2.3.1 Noise management and safeguarding of the Airport

The most effective way to manage the impact of aircraft and airport noise on surrounding communities is through the implementation of appropriate land use planning controls. Compatible land use planning and management is also a vital instrument to ensure that the gains achieved by the reduced noise of the latest generation of aircraft are not offset by further residential development around airports.

To support these planning controls, NASF covers noise from aviation activity and seeks to improve community amenity by minimising noise-sensitive developments near airports, including through the use of additional noise metrics and improved noise disclosure mechanisms.

The area around the Airport Site has been protected for more than 30 years by NSW Government planning restrictions, which have largely limited incompatible urban and residential development, thereby minimising noise receptors (and thus noise impacts) in the vicinity of the Airport.

2.3.2 Ground-based noise

During operations, ground-based noise is generated by a number of airport activities. Sources include aircraft operating on the ground (e.g. engine run-up for maintenance purposes and operating when parked), airport construction and operations, ground vehicles and service equipment.

The ALC will prepare and implement a noise management plan that will include management of ground-based noise.

2.3.3 Projected aircraft noise contours

The detailed airspace design process described in section 2.2.5 will consider the safety of all aircraft and airspace users across the Sydney basin, aircraft operation efficiency and opportunities to minimise noise and amenity impacts on all potentially affected communities, sensitive receivers and the environment. Noise abatement and noise respite opportunities will be examined throughout the design process.

An Australian Noise Exposure Forecast (ANEF) would be prepared for Western Sydney Airport during the detailed airspace design phase, based on modelled long-term parallel runway operations. An ANEF chart endorsed by Airservices Australia would help to refine the existing land use planning controls that have been in place around the airport site over the past three decades. Effective and appropriate ongoing land use and planning controls in the vicinity of the airport will need to be implemented by the NSW Government and local governments, having regard to acoustic standards for these areas.

Indicative aircraft noise contours in the Australian Noise Exposure Concept (ANEC) format for Stage 1 Operations and the Long Term Airport (approximately 2063) operations are shown in Figures 14 and 15. These figures combine the noise exposure contours calculated for both the 05 and 23 operating modes. The EIS contains additional information about noise, including indicative N60s[33] and N70s[34].

ANEC charts are used to describe the potential noise impacts of proposed airport developments. They are calculated under Australian Standard AS2021 and represent a hypothetical future set of conditions at an airport. ANEC charts represent the average noise exposure from an average day's ATM, calculated over a 12-month period.

[33] N60 values represent the average number of aircraft overflights per day exceeding 60 decibels during the period 10pm to 7am.
[34] N70 is a measure of noise exposure that indicates the average number of times per day (or other specified time period) that an aircraft overflight (single overflight from a particular aircraft) will have a maximum noise level greater than 70 decibels.

Figure 14: Indicative ANEC for Prefer 05 and Prefer 23 operating modes – Stage 1

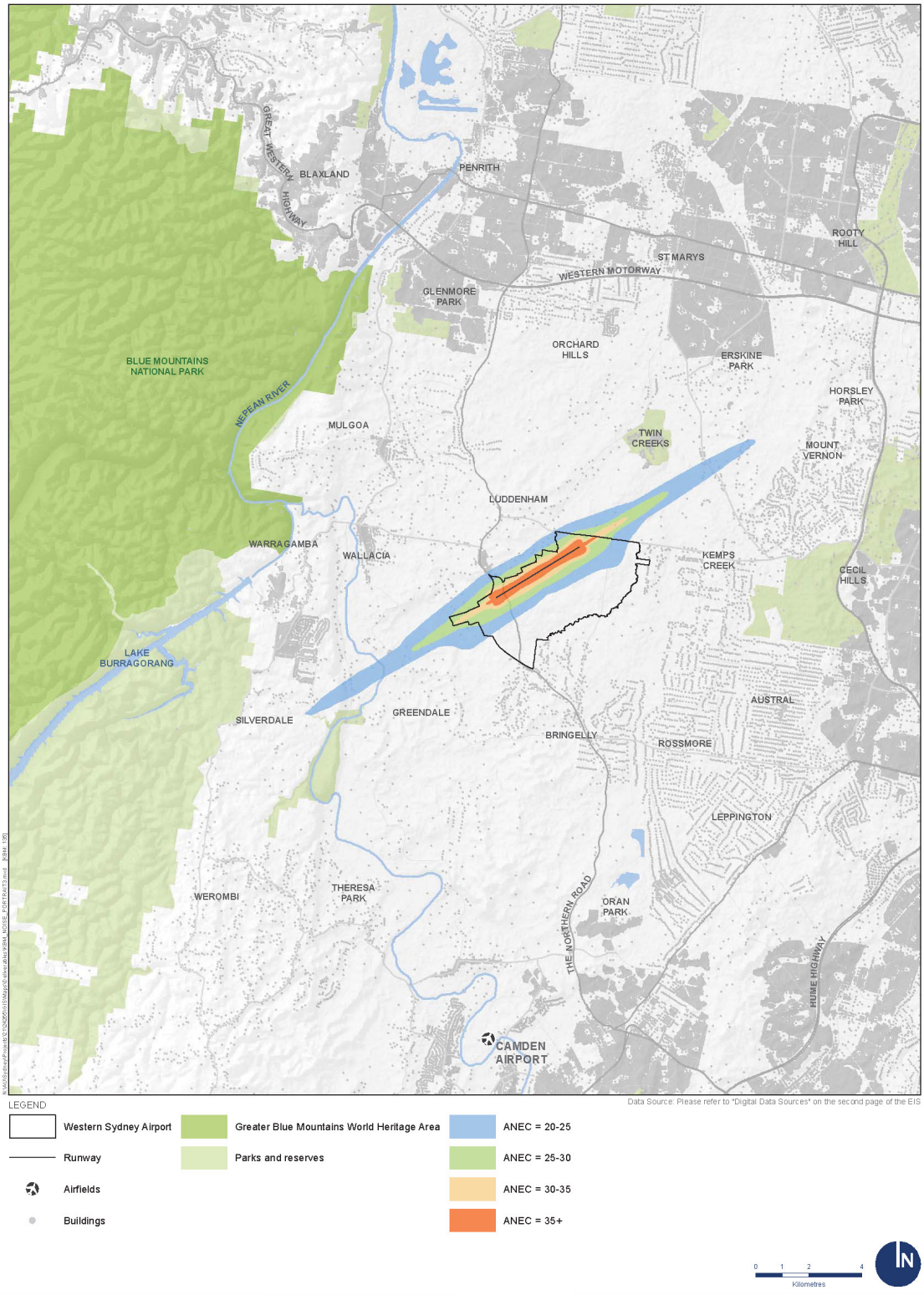
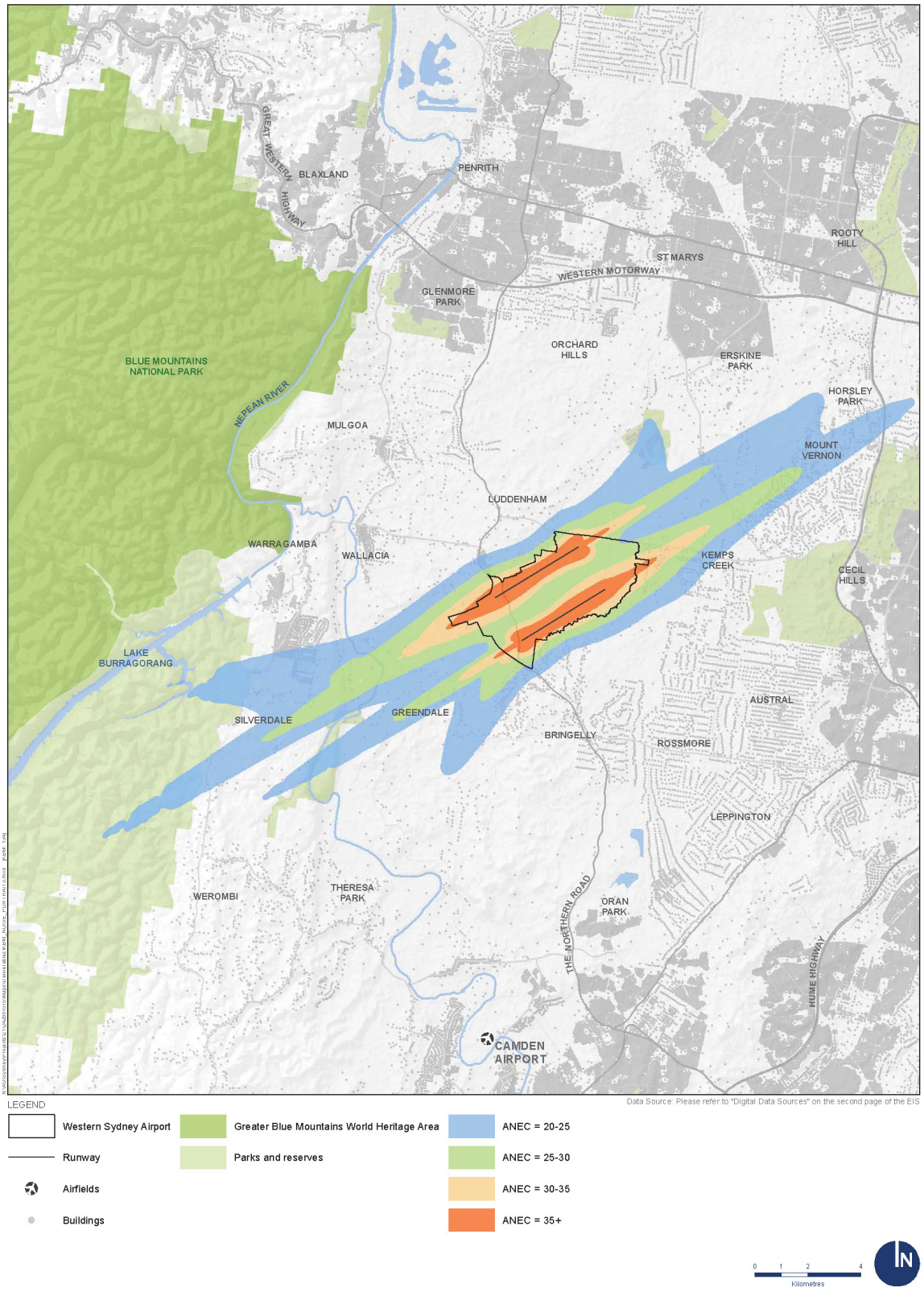


Figure 15: Indicative ANEC contours for Prefer 05 and Prefer 23 operating modes – Long Term



2.4 Land Use Plan, land use zones and permitted uses

Context

This section sets out the Land Use Plan for the Airport that will be applicable in the period between an airport lease being granted and a master plan being approved.

Developments on the Airport Site will be permitted only where they meet the planning objectives and permitted uses for each land use zone.

Once an airport lease is granted, any development (including one set out in Part 3) will require a building approval from the airport building controller under the Building Regulations.

In deciding whether to approve the building activity, the airport building controller will consider, among other things, whether the building activity is consistent with this Land Use Plan (or any subsequent land use plan included in any master plan that replaces it).

In addition to building approvals, for any major airport development proposed on the Airport not covered by Part 3, a draft MDP must also be prepared, referred to the Environment Minister under the EPBC Act, be provided for public consultation, and be approved by the Infrastructure Minister following advice from the Environment Minister before the major airport development can be carried out.

The Infrastructure Minister may refuse to approve a draft MDP if the Infrastructure Minister is satisfied that the draft MDP is inconsistent with this Airport Plan (or any master plan that replaces it).

Any sensitive development (as defined in section 71A of the Act) must comply with section 89A of the Act, which contains additional approval processes for sensitive development.

Land use zones

For land use planning purposes, the Airport Site is divided into a number of zones, as shown in Table 13.

Table 13: Land use zones and overlays

Land use zones Stage 1	
Zone	**Approximate area (ha)**
AD1 Aviation Activity	327
AD2 Terminal and Support Services	229
AD3 Aviation Logistics & Support Facilities	238
AD4 Aviation Activity (Reservation)	511
BD1 Business Development	191
BD2 Business Development (Reservation)	155
EC1 Environmental Conservation	117
TOTAL	1,768

2.4.1 Land Use Plan

Figure 16 shows the Land Use Plan that will apply from the grant of an airport lease until approval of the first master plan.

Figure 17 presents an indicative long-term Airport Site Land Use Plan for reference purposes only. It provides context for the aviation reservation zones included in the Land Use Plan and indicates the expected location of major aviation infrastructure, such as the second runway and associated taxiways.

The boundaries of the airport site and areas outlined in Table 13 will vary as a result of a number of factors including the land acquisitions and disposals referred to in section 2.1.2 and the final design of the detention basins and access roads. Figures 16 and 17 show anticipated boundaries of the airport site following realignment of The Northern Road off the airport site.

2.4.2 Land use zones – objectives and permissible uses

For each zone, there are objectives and permissible uses as well as overarching requirements for some zones.

Objectives

In addition to meeting any overarching requirements for the zone, any development within a zone must be consistent with the particular objectives for that zone (see sections 2.4.2.1 to 2.4.2.7) and must not be inconsistent with the objectives:

- to protect the long-term viability and operational efficiency of the Airport; and
- to ensure that environment and heritage items are appropriately considered and managed.

Figure 16: Airport Site Land Use Plan

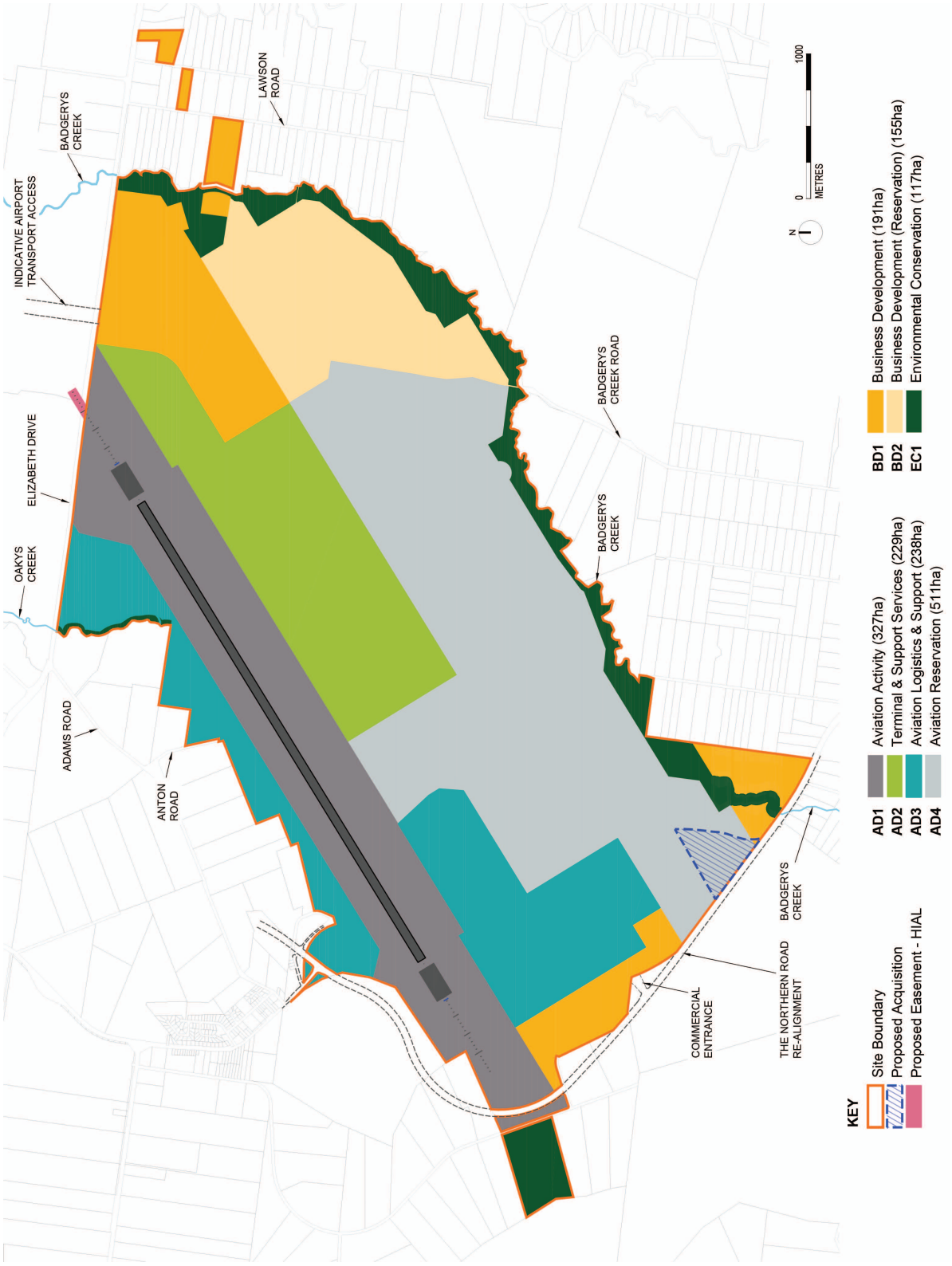
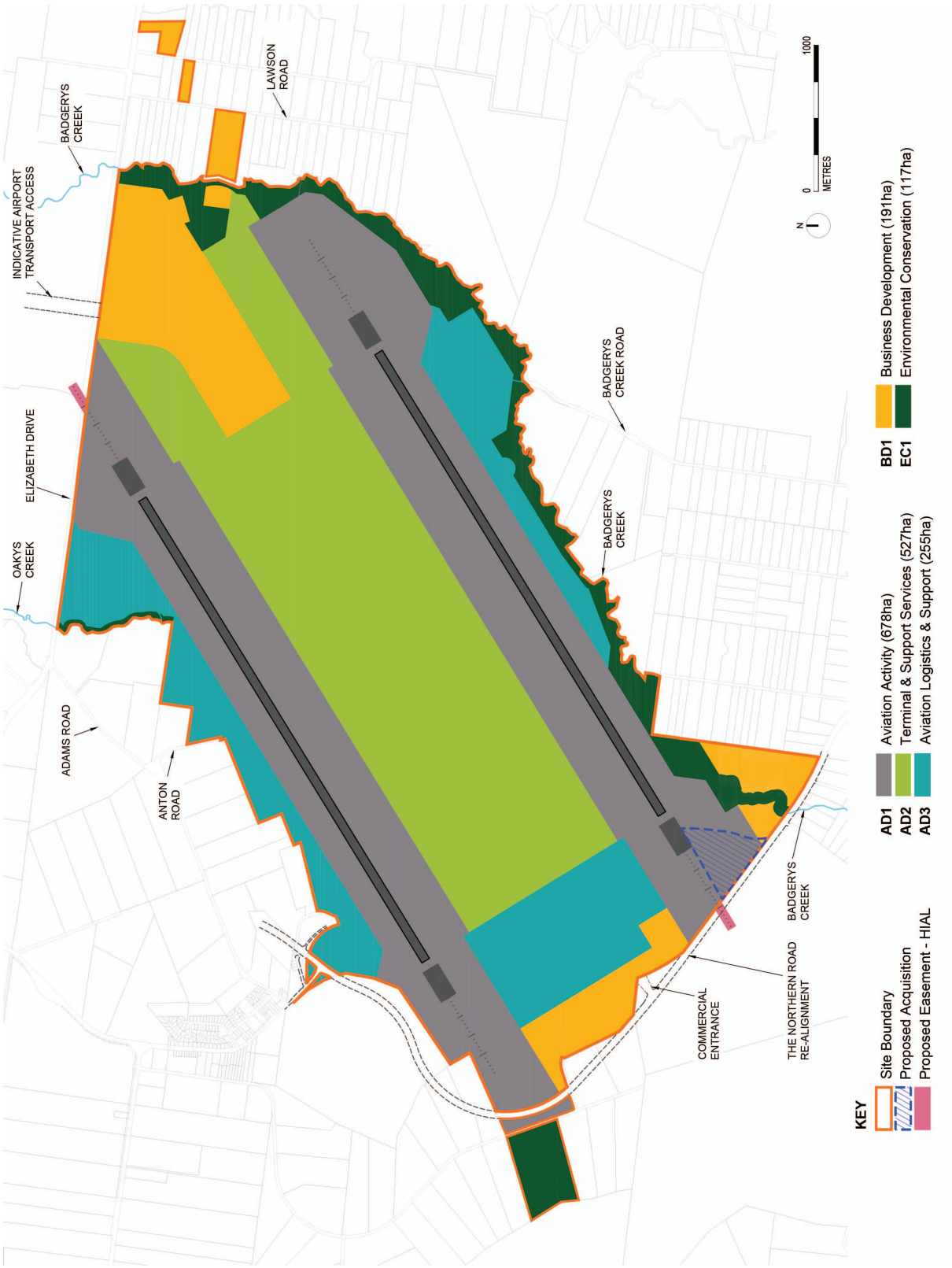


Figure 17: Indicative Airport Site Land Use Plan (Long Term)



Permissible uses

The permissible uses largely adopt the definitions used in the Standard Instrument (Local Environmental Plans) Order 2006 (NSW) except where airport specific terms are required. Definitions of permissible uses are at Appendix B.

A permissible use that is marked with an asterisk '*' is only permissible to the extent that the use relates to the construction, development or operation of the Airport Site as an airport.

Existing uses

In addition to the listed permissible uses, an existing use on the Airport Site as at the day this Airport Plan is determined, is permissible until future development occurs in accordance with the land use objectives and permissible uses contained in this Airport Plan, provided that the existing use continues uninterrupted.

Other requirements

The requirements set out in this section 2.4 are additional to the requirements of Part 3. Plans developed and approved under conditions set out in Part 3 may also contain requirements for the use and management of particular areas of the Airport Site, including the preservation of biodiversity values.

2.4.2.1 Permissible uses in AD1 – Aviation Activity

This zone primarily caters for the northern runway, associated taxiways and navigational aids.

Objectives	Permissible uses
The objectives of the AD1 zone are to: • provide for safe, secure and efficient airfield operations, including aircraft take-off, landing and taxiing; • provide for aviation activities and aviation support facilities; and • facilitate compatible and ancillary functions within the zone provided that development does not render the land unfit for aviation activities.	• **Aviation activity** • **Detention basin** • **Earthworks*** • **Environmental protection works** • **Extractive industry*** • **Liquid fuel depot and distribution facility** • **Navigational aids** • **Public administration facility** • **Public utility undertaking** • **Road** • **Signage (other than an advertisement)** • **Telecommunications facility** • **Temporary structure** • **Works depot***

2.4.2.2 Permissible uses in AD2 –Terminal and Support Services

This zone applies to the terminal precincts and terminal support facilities.

Objectives	Permissible uses
The objectives of the AD2 zone are to: • facilitate development of a contemporary passenger terminal and related facilities for the handling, transfer and processing of passengers that is capable of meeting the standards expected by international, domestic and regional travellers, as well as supporting the needs of the Airport's workforce; • enable future expansion of the Airport's operations, including associated aviation facilities; • encourage airport and aviation-related employment opportunities; • facilitate compatible and ancillary functions within the zone, provided that development does not render the land unfit for aviation activities; and • provide for aviation activities and support facilities.	• **Amusement centre** • **Animal boarding** • **Aviation activity** • **Aviation support facility** • **Business premises** • **Car park and parking spaces** • **Child care centre**[35] • **Convenience store** • **Detention basin** • **Earthworks*** • **Environmental protection works** • **Extractive industry*** • **Food and drink premises** • **Freight handling and transport facility** • **Hotel or motel accommodation** • **Kiosks** • **Liquid fuel depot and distribution facility** • **Markets** • **Navigational aids** • **Office premises** • **Passenger transport facility** • **Public utility undertaking** • **Public administration facility** • **Road** • **Shop** • **Signage** • **Telecommunications facility** • **Temporary structure** • **Terminal** • **Transfer corridor** • **Vehicle hire premises** • **Works depot***

[35] A child care centre is not authorised by Part 3 and, as a sensitive development (as defined in section 71A of the Airports Act) must comply with section 89A of the Act, which requires approval from the Infrastructure Minister for the preparation of a draft MDP for the sensitive development before the MDP can be prepared.

2.4.2.3 Permissible uses in AD3 – Aviation Logistics and Support

This zone applies to land for airport logistics and to support airport operations.

The developments in this zone may include office space related to any of the identified permissible uses.

Objectives	Permissible uses
The objectives of the AD3 zone are to: • facilitate the development of freight services and airport logistics (and ancillary office space); • ensure development is compatible, where practicable, with surrounding land uses in this area; and • facilitate compatible and ancillary functions within the zone provided that development does not render the land unfit for aviation activities.	• **Animal boarding** • **Aviation activity** • **Aviation support facility** • **Business premises** • **Car park and parking spaces** • **Detention basin** • **Earthworks*** • **Environmental protection works** • **Extractive industry*** • **Food and drink premises** • **Freight handling and transport facility** • **Light industry** • **Liquid fuel depot and distribution facility** • **Navigational aids** • **Office premises** • **Passenger transport facility** • **Public administration facility** • **Public utility undertaking** • **Retail – low intensity** • **Road** • **Signage** • **Telecommunications facility** • **Temporary structure** • **Transport depot** • **Works depot***

2.4.2.4 Permissible uses in AD4 – Aviation Reservation

This zone is reserved for future aviation activities and aviation support facilities, and has been informed by the long-term operational requirements of the Airport. To the extent not used for the Stage 1 development, it will be incrementally released for aviation purposes as it becomes operationally required over the next 40 years or so.

Overarching requirements

The non-aviation land uses identified in this zone are permitted in the short to medium term, until the land is required for aviation purposes, provided that:

- the proposed development will not render the land unfit, or affect the capacity of the land to be used, for aviation purposes;
- the proposed development will be capable of being removed or relocated easily and economically; and
- appropriate provisions or arrangements are in place to ensure that the land can be vacated when needed for aviation purposes.

The ALC will be required to pursue development strategies that allow for the necessary controls to ensure delivery of aviation needs. This includes ongoing tenure reviews and the consideration and implementation of temporary and alternative uses.

Development must have regard to biodiversity values in this zone and potential adverse impacts on neighbouring environmentally sensitive areas. The design, construction and operation of such developments will need to consider the sensitivity of and proximity to the biophysical environment, including Badgerys Creek, and investigate the incorporation of appropriate mitigation strategies, such as the provision of setbacks and reserves.

Objectives	Permissible uses
The objectives of the AD4 zone are to: • coordinate the orderly and economic use and development of land until such time as it is required for aviation activities or aviation support facilities; • integrate compatible aviation, business and industrial activities in accessible locations; • encourage appropriate employment opportunities in accessible locations; and • ensure that development will not render the land unfit for aviation activities or aviation support facilities when it is required for these purposes.	• **Agriculture** • **Animal boarding** • **Aviation activity** • **Aviation support facility** • **Car park and parking spaces** • **Detention basin** • **Earth works*** • **Environmental protection works** • **Extractive industry*** • **Navigational aids** • **Passenger transport facility** • **Public utility undertaking** • **Public administration facility** • **Retail – low intensity** • **Road** • **Shop** • **Signage** • **Telecommunications facility** • **Temporary structure** • **Terminal** • **Waste or resource management facility**

Objectives	Permissible uses
	• **Works depot***

2.4.2.5 Permissible uses in BD1 – Business Development

This zone is reserved for onsite business development and has been informed by the operational requirements of the Airport.

Overarching requirements

Development in this zone must not be inconsistent with:

- neighbouring environmentally sensitive areas;
- built-form considerations for the Airport; or
- surface transport access for aviation facilities.

The design, construction and operation of such developments will need to consider the sensitivity of, and proximity to, the biophysical environment and investigate the incorporation of appropriate mitigation strategies, such as the provision of setbacks and reserves. The developments in this zone may include office space related to any of the identified permissible uses.

Objectives	Permissible uses
The objectives of the BD1 zone are to: • enable a mix of business, retail and industrial uses in locations that are close to and that support the functioning of the Airport; • integrate suitable and compatible land uses in accessible locations so as to maximise public transport patronage and encourage cycling; • encourage employment opportunities and promote businesses along main roads; • enable a limited range of other land uses that will provide facilities and services to meet the day-to-day needs of the local workforce; and • maximise, where possible, the use of	• **Agriculture** • **Animal boarding** • **Aviation activity** • **Aviation educational facility** • **Aviation support facility** • **Business premises** • **Car park and parking spaces** • **Child care centre**[36] • **Detention basin** • **Earth works*** • **Environmental protection works** • **Extractive industry*** • **Freight handling and transport facility** • **Hotel or motel accommodation** • **Light Industry** • **Medical centre**

[36] A child care centre is not authorised by Part 3 and, as a sensitive development (as defined in section 71A of the Airports Act) must comply with section 89A of the Act, which requires approval from the Infrastructure Minister for the preparation of a draft MDP for the sensitive development before the MDP can be prepared.

Objectives	Permissible uses
existing access and egress points.	• **Navigational aids** • **Office premises** • **Passenger transport facility** • **Public administration facility** • **Public utility undertaking** • **Recreation facility (indoor)** • **Retail premises** • **Road** • **Service station** • **Shop** • **Signage** • **Telecommunications facility** • **Temporary structure** • **Vehicle hire premises** • **Warehouse and distribution centre** • **Works depot***

2.4.2.6 Permissible uses in BD2 – Business Development (Reservation)

This zone is reserved for future aviation activities and terminal and support facilities. It has been informed by the long-term operational requirements of the Airport. It may be used for onsite business development but, to the extent not used for the Stage 1 development, will be incrementally released for the reserved purposes as it becomes operationally required over the next 40 years or so.

Overarching requirements

A number of activities could be located in this zone in the interim. The ALC will be required to pursue development strategies that allow for the necessary controls to ensure delivery of aviation needs. This includes ongoing tenure reviews and the consideration and implementation of temporary and alternative uses. The non-aviation land uses identified in this zone are permitted in the short to medium term, until the land is required for aviation purposes, provided that:

- the proposed development will not render the land unfit, or affect the capacity of the land to be used, for aviation purposes;
- the proposed development will be capable of being removed or relocated easily and economically; and
- appropriate provisions or arrangements are in place to ensure that the land can be vacated when needed for aviation purposes.

Development in this zone must not be inconsistent with:

- built-form considerations for the Airport; and
- surface transport access for aviation facilities.

The design, construction and operation of such developments will need to consider the sensitivity of, and proximity to, the biophysical environment, including Badgerys Creek, and investigate the incorporation of appropriate mitigation strategies, such as the provision of setbacks and reserves.

Objectives	Permissible uses
The objectives of the BD2 zone are to: • enable a mix of business, retail and industrial uses in locations that are close to and that support the functioning of the Airport; • integrate suitable and compatible land uses in accessible locations so as to maximise public transport patronage and encourage cycling; • encourage employment opportunities and promote businesses along main roads; • enable a limited range of other land uses that will provide facilities and services to meet the day-to-day needs of local workforce; and • maximise, where possible, the use of existing access and egress points.	• **Agriculture** • **Animal boarding** • **Aviation activity** • **Aviation educational facility** • **Aviation support facility** • **Business premises** • **Car park and parking spaces** • **Child care centre**[37] • **Detention basin** • **Earth works*** • **Environmental protection works** • **Extractive industry*** • **Freight handling and transport facility** • **Hotel or motel accommodation** • **Light Industry** • **Medical centre** • **Navigational aids** • **Office premises** • **Passenger transport facility** • **Public administration facility** • **Public utility undertaking** • **Recreation facility (indoor)** • **Retail premises** • **Road** • **Service station** • **Shop**

[37] A child care centre is not authorised by Part 3 and, as a sensitive development (as defined in section 71A of the Airports Act) must comply with section 89A of the Act, which requires approval from the Infrastructure Minister for the preparation of a draft MDP for the sensitive development before the MDP can be prepared.

Objectives	Permissible uses
	• **Signage** • **Telecommunications facility** • **Temporary structure** • **Vehicle hire premises** • **Warehouse and distribution centre** • **Works depot***

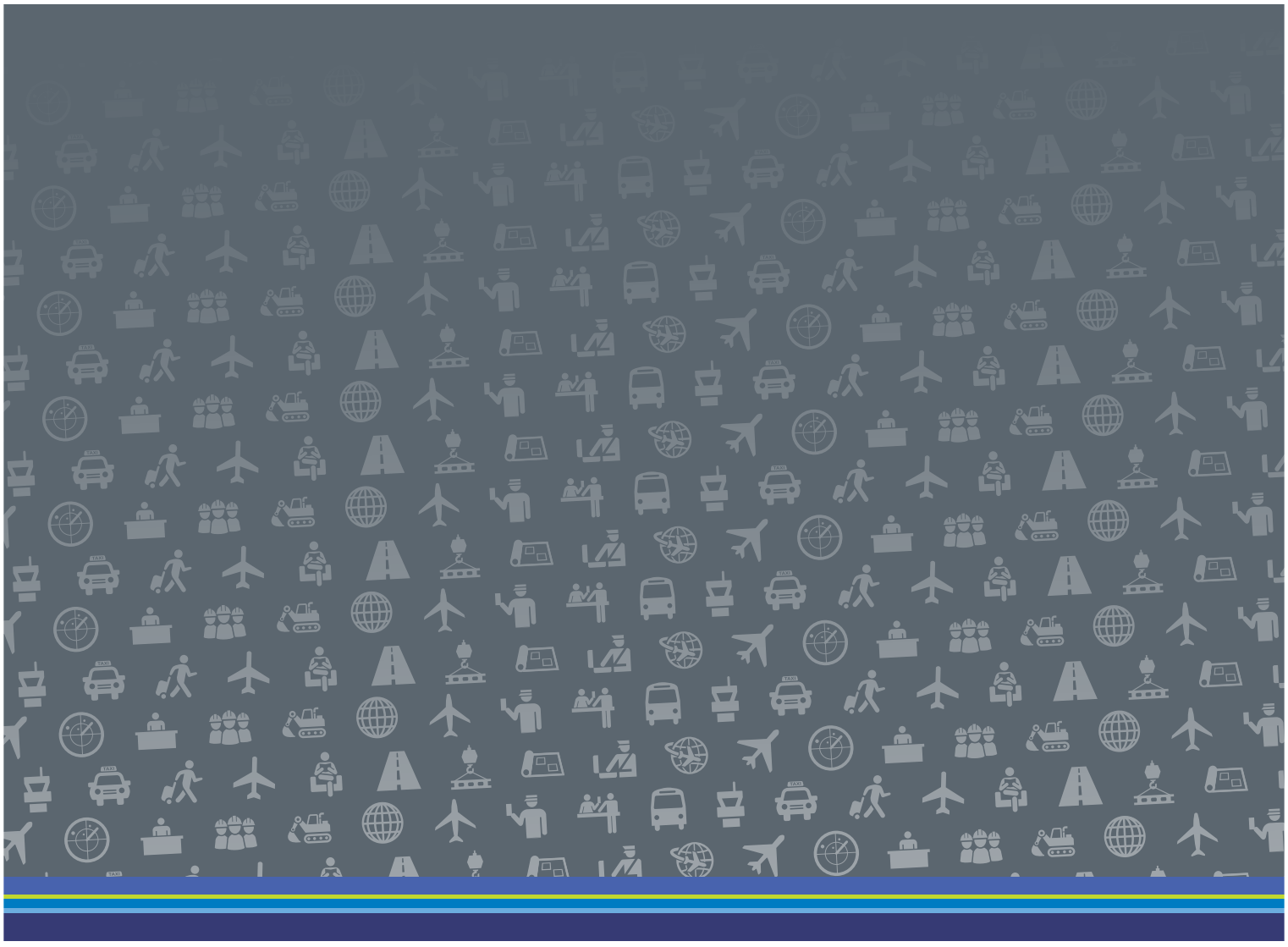
2.4.2.7 Permissible uses in EC1 – Environmental Conservation

This zone applies to the environmental value of the Airport Site, notably with respect to natural habitats and water flows, including Badgerys Creek, and also provides for an environmental preservation corridor to the south of the site.

Objectives	Permissible uses
The objectives of the EC1 zone are to: • protect the ecological and scenic values of the waterways in this area; • maintain the health and natural flows of the waterway; • enhance, restore and protect the cultural heritage values of the land; • enhance, restore and protect local biota and the ecosystems and habitats of native species; • provide for the effective management of remnant native vegetation, including native vegetation regeneration and revegetation, noxious and environmental weed eradication, and bush fire hazard reduction; • enable the land to be used as passive open space in a manner that is not inconsistent with the protection of its natural and cultural heritage values; and • manage development to minimise impacts that could destroy, degrade, damage or otherwise have an adverse effect on natural and cultural heritage values.	• **Environmental protection works** • **Heritage conservation works** • **Public utility undertaking**

PART 3:

Specific developments



Part 3: Specific Developments

3.1 Overview of the Stage 1 Development

In accordance with subsections 96C(3) and (4) of the Act, Part 3 of the Airport Plan sets out the details of developments that are consistent with Part 2 and may be carried out on the Airport Site and Associated Sites. The developments described in this Part are collectively referred to as 'the Stage 1 Development' or 'Stage 1'. In accordance with subsection 96C(5) of the Act, Part 3 of the Airport Plan also sets out conditions to be complied with in relation to these developments.

Subject to the Act, Part 3 authorises the carrying out of the developments as described below. The developments described in Part 3 are expected to be carried out by the Commonwealth, the ALC and other parties under arrangements entered into with the Commonwealth or the ALC. Any developments on the Airport Site, after the Airport lease has been granted, that are not described in Part 3 will be subject to the regulatory regime contained in the Act (refer to section 1.3.1).

Authorised developments will require a building approval under the Building Regulations once an airport lease has been granted. In addition, the developments must be undertaken in accordance with the conditions set out in section 3.10 of this Part 3. Subsection 96J sets out penalties for not complying with a condition.

3.1.1 Summary of the Stage 1 Development

The Stage 1 Development will involve all of the developments necessary to establish an airport on the site.

The developments that form part of the Stage 1 Development will include:

- airside precinct development;
- terminal development;
- aviation support developments;
- utilities development;
- ground transport development;
- site preparatory development;
- ancillary developments; and
- other building activities.

Stage 1 Capacity

On full completion of the Stage 1 Development, the Airport facilities will be capable of handling approximately 10 MAP, as well as dedicated freight operations.

Table 14 sets out the key categories of airport demand that will inform the design of the Stage 1 Development and approximate capacity for the Stage 1 Development. Specific capacity requirements for each category will be refined in final design.

Table 14: Stage 1 Capacity[38]

Category	Stage 1
Annual passengers	10,000,000
Annual passenger ATM	56,000
Annual freight throughput (tonnes)	220,000
Annual dedicated freight ATM	7,000
Design busy hour passengers	
Departing (passengers per hour)	2,000
Arriving (passengers per hour)	2,000
Design busy hour ATM	
Passenger (movements per hour)	19
Freight (movements per hour)	6
Peak movements per hour	21

In addition to accommodating Stage 1 Capacity, the Stage 1 Development will:

- deliver an airport capable of safe and efficient all-weather operations and low-visibility procedures on a 24-hour basis;
- locate each of the Stage 1 elements of the development consistent with the Land Use Plan (or any master plan that replaces Part 2); and
- be designed to be consistent with the development objectives set out in Part 2, including the need to provide for future stages of the Airport's development.

General design considerations – built form

The design of the Airport, notably with respect to the terminal, will consider:

- specific factors relating to climate and geography;
- the urban or local planning context, in particular limitations and constraints;
- the need to ensure that individual developments do not dominate the landscape unless important to the overall design (for example the ATCT);
- morphology and elevation;
- access to natural light;
- transport corridors, including active transport considerations, supporting efficient movement within and between the Airport Site and its surrounds;
- specific design requirements for efficient movement of passengers and operations of the facility;

[38] Busy hour refers to the busy hour for the particular activity. As these busy hours may not occur at the same time, the overall busy hour refers to the peak total for that activity at that time rather than the combined highest totals for that activity. Hence, the combined busy hour for passengers is expected to be 3300 as in Part 2 – Table 1, not 4000.

- universal access for the public, including disability accessibility standards;
- external spaces, circulation and services;
- any particular requirements to address evidence-based design;
- human-scale environments and inviting building frontages;
- clear way-finding with recognisable entrances, directions of movement and definition between arrivals and departures;
- safety and security considerations;
- visual and acoustic separation of the public and operational zones;
- expansion and future-proofing requirements;
- lifespan and life cycles of materials;
- operational, maintenance and environmental services efficiency;
- design for cultural expression;
- the incorporation of Aboriginal and European heritage features;
- integrated design approaches to incorporate landscaping and public art;
- applicable elements of environmentally sustainable design, including energy use and consideration of climate and water-sensitive principles; and
- the anticipated growth and ongoing maintenance in a manner that minimises impacts on operational efficiency and passenger convenience.

3.2 Airside precinct development

The Stage 1 Development will include construction of an airside precinct.

3.2.1 Key principles

Code F aircraft will be the critical design aircraft for airfield geometric layout and design. Deviation from Code F standards may be applied in parts of the airside precinct area, in circumstances where full Code F use is not justified or where a lower code of aircraft is more critical.

3.2.2 Northern runway

A 3,700m long northern runway (05L/23R) will be designed and constructed.

Table 15 provides the runway end coordinates and indicative elevations for the northern runway, which may alter during detailed design of the Airport.

Table 15: Northern runway threshold coordinates and indicative elevations

Runway End	05L	23R
Easting	286914.0611	290067.1149
Latitude (south)	S033° 53’ 30.28”	S033° 52’ 29.75”
Northing	6247443.7898	6249379.8297
Longitude (north)	E150° 41’ 44.65”	E150° 43’ 48.97”
Indicative elevation (meters above sea level)	93.09 AHD	73.22 AHD

Taxiways

The northern runway taxiway system will include:

- a full-length parallel taxiway;
- RETs; and
- other link taxiways, bypass capability and taxi lanes required to provide safe access and circulation between the runway, parallel taxiway and the apron areas.

Lighting, marking, signage and other requirements

The development of the northern runway and airfield system will include lighting, marking, signage and other features, including those required under any legislation or ICAO standards.

3.2.3 Apron

The Stage 1 Development will include the necessary apron areas to accommodate the Stage 1 Capacity. The number and mix of stands will be determined during detailed design. The expectation is that approximately 21 passenger aircraft stands (Code C, Code E and Code F) and four freight aircraft stands will be required to provide the Stage 1 Capacity.

MARS and swing gates may be used to meet the Stage 1 Capacity and reduce the overall stand requirement to approximately 19. A combination of contact stands and non-contact stands will be provided according to airline requirements.

Aircraft stands, ramp areas, aircraft engine start points, apron areas and taxiway/taxilanes will be designed to minimise the effects of aircraft jet blast on any ramp area, including movement/staging areas for ground support equipment (GSE).

Head and back of stand roads

For safe vehicular ground surface manoeuvring and circulation in front of and behind aircraft on the aprons, there will be head-of-stand and back-of-stand spacing and marking for roads provided.

3.2.4 Air traffic control

Air traffic control will be provided as part of the Stage 1 Development. This is expected to be provided through the construction of an ATCT. An ATCT would be a stand-alone installation, located in a segregated and secured facility compound within the Airport boundary.

3.2.5 Aviation Rescue Fire Fighting Services

The Stage 1 Development is expected to include an ARFFS station. The ARFFS station is expected to include staff accommodation, administration and vehicle garaging facilities, fuel storage and delivery systems, fire fighting foam storage and run-off control facilities, and a vehicle maintenance facility.

Provision may also be made to include onsite training facilities, which will include appropriate run-off control measures, such as bunding, to ensure fire-fighting foam and/or other chemicals are contained.

Fire suppression systems, including the provision of adequate pressure, will be developed as part of detailed design.

3.2.6 Navigational support

The runway will be designed to achieve CAT IIIB (or equivalent) instrument approach procedures on both runway ends. All navigational aid zones will be protected to ensure continuous operation of the equipment, including:

- Vehicle critical area;
- Aircraft critical area; and
- CAT II/III sensitive area[39].

The Stage 1 Development will include installation of all necessary navigational aids. Equipment requirements will be finalised as part of detailed design. The key equipment expected to be installed at the Airport as part of the Stage 1 Development is set out below.

Navigational instrumentation

- Precision Approach Path Indicator
- ILS – CAT IIIB, comprising glide path (GP) and localiser (LOC) functionality
- Far field monitor (FFM)
- Distance measuring equipment (DME)
- Advanced-surface movement guidance and control system
- GBAS

Runway lighting

- High intensity runway lights
- Airfield lighting equipment room (ALER), housing all control systems and constant current regulators of the airfield ground lighting system, and back-up power generation equipment
- Runway centreline lights
- HIAL[40]
- Touchdown zone lights
- Runway threshold lights
- Runway wing bar lights
- Runway end lights
- Runway guard lights

Taxiway lighting

- Rapid exit taxiway indicator lights
- Stop bars

[39] ILS installations are subject to signal interference when vehicles or aircraft are operated near the localiser or glide slope antennas. The surface areas within which this interference is possible is delineated as either an ILS critical area or an ILS sensitive area. The boundaries of critical and sensitive areas will often overlap parts of runways and taxiways. Elements for a CAT II/III site include GP antenna array, LOC, DME and FFM (see Navigational instrumentation).

[40] Some elements of the HIAL may be located off the Airport Site and, to the extent this occurs, the area of land will be an Associated Site and the development an Ancillary Development. See section 96L of the Act.

- Taxiway edge lights
- Taxiway centreline lights
- Movement area guidance signs

Weather equipment

- One runway visual range (RVR) touchdown at each runway end
- One RVR roll-out at each runway end
- RVR mid-point
- Illuminated wind direction indicator

3.2.7 Meteorology facilities

Meteorological instrumentation will be provided at the Airport.

An automatic weather station will provide relevant data to support aviation operations. The automatic weather station is expected to include a visibility sensor and ceilometer (for determining cloud base height) as well as sensors for rain, wind and temperature.

3.2.8 Operational considerations for building design

Building designs and materials will be compatible with aircraft operations and navigational aids. This includes:

- ensuring that building heights meet relevant standards;
- materials do not interfere with operations (e.g. due to reflectivity);
- buildings are compatible with the visibility of the airfield for air traffic control capability purposes, and with ground-based and aircraft radar; and
- the building design is such that the Airport is capable of all-weather operations and low-visibility procedures on a 24-hour basis.

Building height limitations

The height of structures on the Airport Site will be determined to ensure that the OLS and other surfaces are protected. With the possible exception of the ATCT, the development will not include any structures that exceed the height of the OLS inner horizontal surface, 45 m above the Airport reference elevation.[41]

3.2.9 Security

It is anticipated that the Airport will be declared as a 'security controlled airport' for the purposes of the *Aviation Transport Security Act 2004* (the ATS Act). It is also anticipated that the Airport will be listed as a 'designated airport' for the purposes of the Aviation Transport Security Regulations 2005 and will therefore be assigned as a Category 1 airport under these Regulations. The Airport will include security features required of this categorisation under the ATS Act and its Regulations.

[41] The average of all existing and proposed runway end elevations.

Key security features are expected to include passengers, staff and goods screening, closed-circuit television, emergency crash gates, a perimeter security fence around the airside areas of the Airport and pass-controlled secure airside access points that restrict access to all airside and landside security zones.

A perimeter road inside the security fencing will provide access to the airfield and perimeter support infrastructure, such as detention basins, water quality structures and navigational aids.

In addition to any perimeter security fence, security fencing may be installed to protect other facilities within security zones such as air traffic control, fuel, navigation and lighting facilities. Other incidental fencing may be installed to control public access at various points around the Airport Site.

3.2.10 Safety

The development will include various elements required to address safety requirements. These include:

- emergency safety response facilities and reserves;
- fuel and other toxic spill containment infrastructure;
- runway end safety areas (RESA); and
- emergency safety assembly areas.

Aircraft isolation and compass calibration pad

An aircraft isolation pad will be constructed to isolate suspect aircraft. It may also be constructed so as to enable it to be used for the calibration of an aircraft's compass during maintenance procedures.

3.3 The terminal development

3.3.1 Key principles

The Stage 1 Development will include construction of a terminal for the Airport and supporting infrastructure for the terminal. The terminal will be designed to accommodate the Stage 1 Capacity having regard to the level of services defined by the International Air Transport Association (IATA) Airport Development Reference Manual as Level of Service (LoS) 'Optimum'.

The terminal design will take account of safety and security considerations.

The IATA LoS Optimum includes factors such as space per passenger and the maximum or average wait time per passenger or average queue length in the 'busy hour'.

3.3.2 Terminal building

Service requirements

The terminal will include facilities for departing passengers, outbound and inbound inspection services and areas for the provision of food and beverage and retail for passengers, visitors and staff.

Location

The terminal will be located in the midfield of the Airport Site, within the terminal and support services zone (AD2), with direct access to the northern runway and its associated taxiway system.

The ground transport access to the terminal will be provided at the northern side of the site, primarily via a high-capacity connection to the M12 Motorway, to be located north of Elizabeth Drive.

Configuration

The terminal will be an integrated international/domestic terminal, with at least two public passenger levels.

Section 3.2.8 deals with height limitations for all buildings on the site.

Size

The terminal will have up to 90,000 m^2 of floor area.

Facilities

The terminal will include passenger and baggage facilities, including all of the facilities required for domestic and international passengers. These include:

- arrivals and departures facilities;
- airline information, ticketing and service counters;
- passenger check-in facilities, including manual and automated check-in facilities as required;
- aerobridges and secure boarding infrastructure;
- passenger and carry-on baggage security screening points, including transit screening as required;
- border control areas (passport control, security screening, immigration/emigration, quarantine and customs checks);
- baggage handling facilities, including baggage check-in, oversize baggage handling, inline baggage screening and inspection, baggage make-up areas and baggage claim systems;
- concourse and circulation areas, including arrival public greeting areas;
- departure lounges and waiting areas;
- airline premium lounges;
- landside and airside retail and food and beverage facilities, including duty free outlets;
- connections to ground transportation, including car parking, buses, taxi and rental cars; and
- other amenities, including restrooms, traveller/tourist information, car hire desks, medical facilities and multi-faith facilities.

The terminal will include a range of other facilities that are not related to passenger and baggage processing. These will be determined as part of detailed design but would be expected to include at a minimum:

- offices (including airline, airport operations and regulatory authority offices);
- staff and goods screening points and secure access points;
- emergency and security operations facilities, including media rooms;

- VIP facilities, as required;
- safety systems, including fire, alarm and emergency evacuation systems;
- storage rooms, areas and facilities;
- meeting and conference facilities;
- retail cool rooms;
- services, plant and infrastructure;
- loading docks and goods access passages;
- fixed walkway and bridge links;
- escalator, travelator and lift equipment;
- passenger information and public announcement equipment; and
- air conditioning and other roof plant.

3.4 Aviation support facilities development

All required aviation support facilities will be constructed. The key facilities are described in more detail below.

3.4.1 Aircraft maintenance facilities

An aircraft maintenance precinct will be constructed and will include access to both airside and landside precincts.

The aircraft maintenance facilities may also include:

- hangars;
- provision for support activities;
- aircraft engine maintenance testing;
- compass calibration;
- aircraft wash;
- staff car park; and
- fuel requirements for ground vehicles.

3.4.2 Freight and cargo

A secure freight precinct will be constructed to meet the Stage 1 Capacity requirements with access to aprons and taxiways as well as landside access. The freight apron may be located either in the aviation logistics and support zone (AD3) at the western end of the Airport Site (its anticipated longer term location) or within the terminal and support services zone (AD2) near to the passenger terminal area.

The freight precinct may also include a cargo terminal complex and provision for support activities, such as:

- storage facilities, including for multi-level stacking racks, GSE and unit load devices (ULDs);
- freight handling facilities and warehouse, including a facility where freight can arrive at the Airport by truck and be security screened before being loaded onto aircraft;
- bonded stores;

- associated offices for freight and government agencies;
- customer reception, including airline passenger pet check-in;
- truck docking;
- cargo staging;
- cargo agents;
- associated operational, staff, truck and visitor parking; and
- airside and landside access roads.

3.4.3 Flight catering

Appropriate airside and/or secure landside access for flight catering providers will be constructed.

Developments in support of flight catering may include construction of:

- a truck manoeuvring area for one or more loading docks within the complex;
- truck and car parking;
- a fuel (ground vehicles) facility;
- flight kitchen;
- bonded stores;
- cool rooms and stores;
- wash facilities for aircraft inflight meal equipment;
- truck docks;
- administrative offices; and
- airside and landside access roads and vehicle parking.

3.4.4 Ground support equipment and unit load device maintenance facilities

GSE maintenance facilities may be constructed, including:

- GSE maintenance workshop structure with gantry crane and service pits;
- tool and spare stores; and
- waste storage and handling for fuels and oils.

GSE and ULD maintenance facilities may be constructed to accommodate airline or maintenance, repair and overhaul activities. The facilities may include:

- aircraft hangar(s), associated aircraft apron and access taxilanes;
- associated workshops and stores;
- GSE/ULD storage areas;
- associated offices and car parks;
- associated operational, staff, visitor and truck parking; and
- airside and landside access roads.

3.4.5 Agency kennels

A facility to provide boarding, exercise and training facilities for Commonwealth agency dogs may be constructed. The facility may include storage of trace materials, such as explosives, and illicit drugs.

3.4.6 Other support facilities

Car rental facilities

Car rental facilities will be constructed. These facilities may include:

- vehicle storage and circulation areas;
- buildings for office administration, staff rooms and amenities;
- vehicle workshops, including hoists, parts cleaning and storage;
- servicing equipment, such as vehicle diagnostic tools and other mechanical, hydraulic and compressed air tools;
- vehicle washing and cleaning equipment, including dedicated wash bays; and
- refuelling facilities for vehicles.

Vehicle storage and circulation areas may be provided on paved areas, and may be covered and include external lighting.

Industrial units

Industrial units for a range of airport service providers may be constructed, consisting of small strata-style industrial units. Uses may include metal fabrication and repair; mechanical, electrical or hydraulic equipment repairs; and motor vehicle or GSE repairs.

Offices

A business park with a ground footprint of up to 2,500 m^2 may be constructed. It could comprise office accommodation for government agencies, service providers and airport-related businesses, as well as amenities such as food and beverage outlets.

Additional facilities

Other airport support facilities which may be constructed include:

- government agency facilities, such as an Australian Federal Police Operations Coordination Centre and facilities for an Emergency Operations Centre, the Australian Border Force and biosecurity requirements;
- ALER building;
- airport ground maintenance facility; and
- amenities for employees.

3.5 Utilities development

The Stage 1 Development will include construction of utilities infrastructure on the Airport Site.

3.5.1 Key principles

The Stage 1 Development will include the reticulation of utilities, including power, water, gas and telecommunications from external suppliers consistent with 24 hour operations, which anticipates the longer term needs of the Airport.

Detailed design will have regard to how the proposed utilities may be upgraded to accommodate future capacity without disruption to the Airport operations.

Utility supply

It is expected that utilities will be connected to the site boundary by the relevant utilities supplier. Off-site works associated with connecting the utilities to the boundary will be the subject of separate planning and approval processes where required.

Corridor identification and preservation

Services entering the site will, where possible, be appropriately integrated and co-located within the transport access reserves and using common trenching. Supply corridors will be located within the Airport that can be accessed with minimal disruption to the Airport's operations.

3.5.2 Relocation and removal of existing utilities

The Stage 1 Development will include decommissioning and removal of a range of existing utilities. Where off-site services, such as those provided to surrounding residents and businesses, rely on existing onsite infrastructure that is inconsistent with the Airport's development, the affected infrastructure will be relocated by, or in consultation with, the relevant utility provider in accordance with that provider's established processes.

Specific requirements to ensure surrounding services to existing customers are maintained, including the need for any infrastructure relocations, will be determined as part of detailed design. Table 16 sets out anticipated relocation and/or modification expectations.

The Stage 1 Development may include the construction works required to relocate all or part of the TransGrid 330 kV transmission line crossing the Airport Site so that the transmission line is underground within the Construction Impact Zone.

Table 16: Services expected to be removed, relocated, or modified

Utility	Type	Location of utility/service requiring relocation or modification
TransGrid (Electricity – distribution)	330kV high-voltage transmission line	Approximately 3.2 km section crossing the south-western corner of the Airport Site
Telstra (Telecommunications)	Optic fibre cable (underground)	Badgerys Creek Road from Elizabeth Drive to Bringelly exchange
	Overhead cables	Relocate underground along Elizabeth Drive and in the new section of The Northern Road
	Mobile phone towers (off-site) (Subject to any impact on OLS and PANS-OPS limitations)	70 Mersey Road, Bringelly 2292 The Northern Road, Luddenham 851 Luddenham Road, Luddenham 1725 Elizabeth Drive, Badgerys Creek
Endeavour Energy (Electricity – distribution and supply)	Overhead cables (33 kV)	33 kV transmission line along Elizabeth Drive to be relocated underground in vicinity of the Airport
	Overhead cables (11 kV)	Relocate underground along Badgerys Creek Road and in the new section of The Northern Road
Sydney Water (Water)	Water main	Badgerys Creek Road from Elizabeth Drive to boundary with Airport Site
	Water main	Relocate underground in the new section of The Northern Road
Private easement	Water supply	Located in the south-east corner of the Airport Site, running east-west from the southern end of the Sydney water main on The Northern Road to private land outside the Airport Site (Mersey

3.5.3 Water

The Stage 1 Development will include the construction of potable water infrastructure to and on the Airport Site. The primary connection point will be located at the boundary of the Airport Site at Elizabeth Drive. Other connection locations may be identified in consultation with utility providers.

The development may also include provision for the use of non-potable water for appropriate purposes.

Water infrastructure will provide for at least two days' redundancy stored on site, based on the maximum day demand for both potable and non-potable water. This includes adequate water resources to allocate to the ARFFS for fire suppression, including training activities.

The Stage 1 Development may also include a recycled water treatment plant.

Recycled water

The production of treated wastewater is expected to exceed demand for recycled water at the Airport. The Stage 1 Development may be constructed to allow for surplus wastewater, once treated to acceptable standards, to be discharged through irrigation within the Airport Site, including through subsurface irrigation. The quantities of treated wastewater and, thereby, the volumes of recycled water available will be refined as part of detailed design.

A mechanism will be identified to allow for the recycled water to be re-used, disposed by irrigation or disposed by other means.

3.5.4 Electricity

System capacity requirements

The Stage 1 Development will include construction of electricity infrastructure for the Airport. The supply voltage to the Airport Site is expected to be 132 kV.

Reliability and backup supply capacity requirements

An N-1 level of reliability will be required for the electricity supply[42] to and across the Airport Site. N-1 reliability to the Airport may be achieved by the electricity provider using several designated supply routes and connecting onsite to separate zone substations and the distribution network.

Connection – onsite delivery and distribution

The electrical connections at the boundary of the Airport Site are expected to be at Elizabeth Drive and The Northern Road. Additional or alternative connection points may be established subject to the establishment of new local substations in the vicinity of the Airport Site.

3.5.5 Gas

System requirements

The Stage 1 Development will include construction of gas infrastructure for the Airport Site. In consultation with the gas supplier(s), gas supply based on anticipated demand will be determined. A distribution main reticulation with an expected pressure rating of 210 kilopascals (kPa) will be designed to run through the Airport Site with connection points to meet the requirements of the gas users.

Onsite delivery and distribution

The gas connection will be at the boundary of the Airport Site and is expected to occur via the 200-millimetre diameter steel secondary gas main located along Elizabeth Drive. At the connection

[42] N-1 means the ability of the electricity system to continue to supply the loads connected to the system even if any one element were to fail.

point to the Airport, a pressure-reducing station is expected to be required to change the secondary mains pressure to 210 kPa for onsite reticulation.

3.5.6 Aviation fuel

Facilities for the handling of aircraft fuel and lubricants will be constructed. These facilities will include storage of aircraft fuel, such as Jet A-1, as well as fuel transfer and aircraft refuelling and defuelling facilities.

Fuel farm storage requirements and location

The Stage 1 Development will include construction of a fuel farm with fuel storage equivalent to at least three days' demand for the estimated fuel usage for Stage 1 operations. The fuel farm will be designed with regard to fuel storage requirements in the longer term.

The fuel farm will be located near the north-western boundary of the Airport, off Anton Road. The fuel farm will include up to four fuel tanks of adequate size and volume to ensure three days' supply is available, and adequate allowances for protection bunds and buffers as required. Airside access to the fuel farm will be required to enable ongoing maintenance, inspection and, where required, refuelling of on-ground refuelling vehicles.

The fuel farm will be in a secure area of the Airport and may also include administrative offices, workshops, stores and parking for operational vehicles (tanker, into-plane refuelling vehicles), staff and visitors.

Fuel distribution on site

A purpose-built underground piping system will be constructed. The fuel delivery grid will distribute fuel to a network of airside hydrants to be located at aircraft stands. The pipeline grid within the fuel farm and servicing the Airport will provide bypass capability and ensure adequate redundancy is in place.

For aircraft unable to connect to a hydrant, the Stage 1 Development will also include provision for ground-based refuelling trucks to be filled via a designated hydrant filling stand. The stand area, within the vicinity of the terminal, may include space for tanker garaging and support activities.

Fuel delivery to the fuel farm

Anton Road, via Adams Road, is anticipated to be the primary access point for fuel deliveries by road and will be upgraded to enable access by B-double vehicles. This will be subject to a separate planning and approval process for works outside the Airport Site.

A secure, landside delivery point immediately adjacent to the fuel farm will be provided for fuel delivery. The fuel farm will allow for a minimum of two and up to five B-double tankers to be unloaded at a time, and will include facilities for decanting fuel.

3.5.7 Wastewater

The Stage 1 Development will include construction of wastewater infrastructure for the Airport Site. It is expected that onsite wastewater treatment will be required, unless a new regional treatment facility is developed nearby, allowing off-site treatment. In the event that external wastewater

infrastructure is constructed by utility providers to support surrounding developments, a connection point for discharging surplus wastewater may be established.

The processes, technologies, footprint and location of the wastewater treatment plant, if required – including odour requirements, chemical handling processes and sludge disposal – will be determined as part of the detailed design process.

If connection to off-site treatment is required, a pipeline may be built across the site.

3.5.8 Waste disposal

The Stage 1 Development will include construction of facilities for waste disposal, and may include:

- a location(s) for onsite waste collection that will allow for sorting and separate storage for off-site disposal of recyclable, non-recyclable and hazardous materials;
- distributed vacuum systems within the terminals and a process plant to separate the waste streams; capable of being scalable as new terminal floor space is brought online;
- a waste management transfer depot for collection and dispatch to landfill or other off-site disposal facilities;
- facilities for recycling; and
- facilities on the Airport Site that could convert the waste stream to energy.

Aircraft waste disposal

Facilities for the management of aircraft waste will be constructed, including any facilities required for quarantine waste collection and disposal for all international operations. A waste to energy facility for recovery of energy from quarantined waste may be constructed.

3.5.9 Petrol and diesel

In addition to the fuel farm, facilities for holdings of petrol and diesel, including unleaded petrol, may be constructed for use by ground-based vehicles.

3.5.10 Communications

Stage 1 will include construction of communications facilities on the Airport Site and necessary connections with off-site communications infrastructure. To ensure continuity of communications, two separate communication connection points to the Airport are expected to be provided by fibre optic cable. The location of these access points will be determined in consultation with the utilities provider but are expected to be in the vicinity of the Elizabeth Drive and The Northern Road ground transport access points.

In consultation with utility providers, the installation of an optical fibre loop around the Airport building, with capacity for multiple fibre access points, may provide connectivity throughout the Airport Site and ensure adequate redundancy exists without compromising airport operations. Construction of designated communications rooms is expected to be required within the terminal building to terminate the incoming optic fibre and facilitate onsite distribution to the reticulated optic fibre network.

Access to the mobile phone network and Wi-Fi coverage will be determined in consultation with telecommunications supplier(s) but is likely to use a combination of onsite and off-site transmitters and include mobile and landline telephone coverage, high-speed optic fibre and Wi-Fi connections. The level of connectivity available will be based on the anticipated demand.

3.6 Ground transport development

Ground transport infrastructure will be constructed for secure airside traffic access and, landside, for public or restricted access purposes.

3.6.1 Airside roads

Airside roads, including a perimeter road, will be provided to ensure safe and efficient movement of vehicles without disruption to aircraft operations between the terminal area and support facilities.

Secure airside access

A number of airside secure access points will be provided.

Emergency access is expected to be available via Badgerys Creek Road, Anton Road, The Northern Road connection, and any secondary access provided off Elizabeth Drive, as well as via the primary public entrance off the M12 Motorway.

3.6.2 Landside roads

The Stage 1 Development will establish landside roads. Road access will provide for private cars, commercial traffic, buses, pedestrians and cyclists. The details of road access will be prepared during detailed design in consultation with NSW and Local Government Authorities, and is expected to address:

- road design speeds;
- security issues;
- traffic loads from airport and other developments on site;
- connections with off-site/external roads, including matching capacity, speeds and road geometry;
- modal share of traffic loads;
- forecast traffic flows, including public transport requirements;
- car parking;
- commercial and operational vehicles and storage;
- terminal interface;
- passenger pick-up and drop-off by private and commercial vehicles;
- pedestrian linkages between terminals and all transport drop-off/pick-up areas;
- pedestrian, cycle or road networks for movement around the Airport Site;
- use of dedicated busways;
- ability to continue to provide access to and from the Airport when key intersections are unavailable; and
- the ability to expand, with minimal disruption, to meet future airport and business development requirements.

Public access

The primary public access road to the Airport Site will be from the M12 Motorway. RMS will construct the connection between the M12 Motorway and the Airport Site boundary. This will be subject to a separate approval process conducted by RMS.

The primary public access road is expected to include the following design elements:

- a minimum design speed of 90 kilometres per hour (km/h) for the main carriageways, including the connections to the M12 Motorway, decreasing to safe speeds in the vicinity of the terminal forecourt and ground transportation centre;
- a minimum of two, with provision to expand to up to three, trafficable lanes, plus bus lanes and shoulders in each direction on the main carriageways;
- prioritisation of public transport; and
- provision for efficient and safe vehicle movement around the ground transport facilities within the terminal forecourt, including access to the commercial precinct, support areas and airport parking.

Subject to revised traffic arrangements for the M12, secondary public access points from Elizabeth Drive may be provided on either side of the primary public access road.

Pedestrian and cycle access will be included in the terminal and ground transport precincts and parking areas. Where possible pedestrian and cycle routes will be provided throughout the Airport Site, including:

- pedestrian-graded ramps for level changes for passengers arriving/departing with baggage; and
- safe undercover pedestrian movement between premium parking, pick-up/drop-off areas and terminal facilities.

Commercial access

The access road from The Northern Road (realigned) is expected to have a minimum of two trafficable lanes and shoulders in each direction on the main carriageways.

3.6.3 External roads crossing the site

The Northern Road

The Northern Road is a state road under the care and control of RMS. As it currently transects the Airport Site, The Northern Road will be realigned by RMS outside the area required for the construction and operation of the Airport and utilities in easements may be relocated. RMS will also construct a connection between The Northern Road and the Airport Site boundary.

Realignment of The Northern Road will be subject to a separate approval process conducted by RMS. Following realignment, sections of The Northern Road will be demolished.

Badgerys Creek Road and adjoining roads

Badgerys Creek Road (onsite portion) is a local road owned by the Commonwealth, under the care and control of Liverpool City Council. As part of the Stage 1 Development, the northern section of

Badgerys Creek Road and adjoining roads, located within the Stage 1 Construction Impact Zone, are expected to be closed to the public and demolished.

Sections of Badgerys Creek Road and other adjoining roads, including Pitt Street, within the Airport Site but outside of the Construction Impact Zone, may remain open for public access and use as an alternative secure access to the Airport Site. Modifications may therefore be carried out as part of the Stage 1 Development.

Other existing internal roads

Minor roads within the Airport Site may be closed when they are no longer required or may remain in place for interim uses permitted by the Land Use Plan.

Other external roads

Some external roads are expected to be upgraded or modified to take account of the Airport. These would be subject to separate approvals. The Stage 1 Development will include onsite works necessary for connection to those off-site roads. Off-site road developments, additional to those mentioned above, are expected to include:

- Adams Road, which may need to be upgraded from Elizabeth Drive at least to Anton Road to meet the needs of airport support traffic; and
- Anton Road, which may need to be upgraded from Adams Road to meet the need for secondary access to non-public airport facilities located along the northern site boundary.

3.6.4 Parking

The Airport will include dedicated car parking facilities for up to 12,500 vehicles[43] and may include multi-storey or covered/uncovered surface-level facilities for:

- commercial parking for airport customer vehicles;
- employee and operational parking;
- commercial vehicle parking and storage;
- parking for rental cars; and
- emergency services vehicle parking.

3.6.5 Ground transport facilities

Ground transport facilities will be constructed and provide for connections to the terminal, including:

- drop-off zones;
- pick-up, including waiting zones;
- loading zones;
- emergency service vehicles;
- commercial and operational vehicle parking and storage;

[43] Activity forecasts suggest the estimated number of parking spaces needed is 11,500. This number does not include parking for specific facilities.

- buses;
- taxis;
- hire cars;
- pedestrian and cycle access; and
- rental cars.

3.6.6 Rail

The Stage 1 Development will be designed having regard to the provision of rail to the Airport Site.

3.7 Site preparatory development

The Stage 1 Development will include all required site preparatory activities.

Key site preparatory activities will include site clearance, contamination remediation, stormwater detention infrastructure and bulk earthworks.

3.7.1 Pre-existing site issues/demolition

All structures on the Airport Site (including structures with heritage value) may be demolished or removed. The human remains located in graves on the Airport Site will be disinterred in accordance with a cemeteries relocation management plan that will be developed taking into account the following principles:

- consultation with relatives and stakeholders;
- reasonable public notice prior to the commencement of exhumation activities;
- reasonable endeavours to contact surviving relatives;
- consideration of public health and heritage matters; and
- carrying out activities sensitively with due respect and reverence.

Existing roads on the Airport Site are discussed in section 3.6.3.

Existing utilities infrastructure is discussed in section 3.5.2.

3.7.2 Site clearance

Approximately 1150 ha of the Airport Site will be cleared as part of the Stage 1 Development.

3.7.3 Earthworks

Earthworks will be undertaken to support and facilitate the establishment of a fully functional airport.

Bulk earthworks will be undertaken in the Construction Impact Zone. The Construction Impact Zone is indicatively shown in Figure 2 and will be finalised as part of detailed design. No bulk earthworks will occur in the environmental conservation areas (EC1 zone in the Land Use Plan).

Bulk earthworks, described in this section, will be modelled to balance cut and fill volumes to the extent possible to minimise the requirement for bulk import or export of material.

The anticipated earthworks requirements are included in Table 17.

Table 17: Indicative Bulk Earthworks Quantities

Scenario	Indicative Stage 1 Development requirements
Bulk earthworks footprint area[44]	1,065 ha
Topsoil stripping	1,903,496 cubic metres (m^3)
Maximum cut depth	30.9 m
Maximum fill height	15.1 m
Total cut (surface to surface)	22,044,670 m^3
Total fill (surface to surface)	20,916,982 m^3

3.7.4 Site remediation

The Stage 1 Development will include contamination and site remediation for those areas of the Airport Site that are affected by the Stage 1 Development.

3.7.5 Surface water management infrastructure

The Stage 1 Development will include the construction of surface water management infrastructure for the Airport Site. The following surface water management infrastructure will be constructed:

- pit and pipe system for the drainage of the apron areas;
- an integrated system of open channels combined with a pit and pipe network to collect rainfall run-off from the Airport Site and convey it to bio-retention basins to improve water quality prior to discharge off site; and
- detention basins located around the edges of the Airport Site to provide detention and treatment of surface water run-off before discharge into major watercourses. The basins will be designed to operate as dry basins.

Based on the long-term indicative layout (as shown in Figure 4), the estimated detention basin and bio-retention area requirements and sizes for the Stage 1 Development are set out in Table 18 – clockwise from the primary public access road. The exact number, location and size of the basis will be determined as part of detailed design.

[44] The bulk earthworks footprint area represents the approximate area within the Stage 1 Construction Impact Zone affected during bulk earthworks; the final footprint will be determined during detailed design.

Table 18: Indicative detention basin and bio-retention sizes

Detention basin[45]	Detention basin and bio retention area use	Stage 1 detention volume (m^3)	Stage 1 minimum bio retention area (m^2)
1	Detention/Treatment	125,000	6,000
2	Detention/Treatment	39,000	2,200
3	Detention/Treatment	100,000	6,000
4[46]	Detention/Treatment	Not required for Stage 1	Not required for Stage 1
5	Detention/Treatment	Not required for Stage 1	Not required for Stage 1
6	Treatment	Not required for Stage 1	1,500
7	Detention/Treatment	101,000	10,000
8	Detention/Treatment	117,000	5,000
9	Detention/Treatment	59,000	2,000

Water quality

The water quality management infrastructure provided is expected to include such measures as:

- flame traps on the apron areas to collect accidental spills;
- swales to manage and provide initial treatment and conveyance for stormwater run-off from runway and taxiway areas; and
- bio-retention basins to manage pollutants through media filtration and biological processes.

3.8 Ancillary developments

Ancillary developments are developments expected to be located off the Airport Site on land over which the Commonwealth of Australia has rights, such as an easement permitting the development.[47]

HIAL that is not located on the Airport Site is an Ancillary Development and will be constructed in the approximate location shown in Figure 2. The construction of HIAL includes clearance and earthworks to the extent necessary for the HIAL.

[45] Numbered clockwise around the Airport Site from north-east corner.
[46] Basins 4 and 5 likely to be required as part of the development of the second runway infrastructure.
[47] The areas of land outside the Airport Site with rights for airport-related development are an Associated Site – refer to section 96L of the Act.

3.9 Other building activities

The Stage 1 Development will include all activities to support construction of the Stage 1 Development. These activities may include:

- access roads;
- asphalt plant;
- blasting;
- chemical storage;
- concrete batching plant;
- contaminated groundwater treatment;
- contaminated soil treatment;
- crushing, grinding or separating;
- extractive activities;
- fencing;
- laydown areas;
- maintenance facility;
- site offices and other construction facilities;
- supply of water for construction; and
- temporary fuel farm.

3.10 Conditions

This section of the Airport Plan as determined will contain conditions that are imposed in accordance with section 96C of the Airports Act, including any conditions required by the Environment Minister following finalisation of the EIS.

The conditions may relate to a range of matters including the mitigation measures and environmental management considerations addressed in Chapter 28 of the EIS. Those measures include preparation, approval and implementation of environmental management plans such as detailed plans for construction environment management, biodiversity offset delivery, cemeteries relocation, operational environment management and ground transport management, sustainability and stakeholder engagement.

Appendix A: Glossary, Acronyms and Abbreviations

Glossary

Term	Meaning
the Act	*Airports Act 1996 (Cth)*
the ATS Act	*Aviation Transport Security Act 2004 (Cth)*
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled
Airport	The airport located at the Airport Site Note: the Airport is referred to in the Act as Sydney West Airport and also commonly known as Western Sydney Airport
Airport Site	The site for Sydney West Airport as defined in the Act
Airport Lessee Company	The company that is granted a lease over the Airport Site
Airspace Protection Regulations	Airports (Protection of Airspace) Regulations 1996
Ancillary developments	An 'ancillary development' as set out in section 96L of the Act
Apron	The part of an airport used for: (a) the purposes of enabling passengers to embark/disembark an aircraft; (b) loading cargo onto, or unloading cargo from, aircraft; and/or (c) refuelling, parking or carrying out maintenance on aircraft
Associated Site	An 'associated site for Sydney West Airport' as set out in section 96L of the Act
Building Regulations	Airports (Building Control) Regulations 1996
CAT IIIB instrument approach	CAT IIIB instrument approaches are used to provide a highly accurate means of guiding an approaching aircraft onto the runway and during take-off operations in low visibility conditions
Condition	A condition set out in Part 3 of this Airport Plan in accordance with section 96C of the Act
Construction Impact Zone	The area that will be directly impacted by construction of the Stage 1 Development – indicatively shown in Figure 2
Environment Minister	The Minister responsible for the EPBC Act
Environmental Impact Statement	The environmental impact statement prepared in relation to the Airport under the EPBC Act
the EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999 (Cth)*
IATA Level of Service – Optimum	International Air Transport Association (IATA) Airport Development Reference Manual as Level of Service (LOS) 'Optimum'. Most major Australian airports are designed to meet IATA LOS Optimum

Term	Meaning
ICAO Standards	The ICAO Standards and Recommended Practices described in section 1.3.4
Joint Study	The 2012 *Joint Study on Aviation Capacity in the Sydney Region* as uploaded on the Department website: www.westernsydneyairport.gov.au/sydney_av_cap/index.aspx
Infrastructure Minister	The Minister responsible for the Act from time to time
Landside	That area of an airport and buildings to which the public normally has access
Land Use Plan	The land use plan set out in section 2.4
Laws	Statutes, regulations, rules, by-laws and other subordinate legislation of the Commonwealth or a state or territory
Long Term	The long- term development of the airport, including parallel runways and facilities for up to 82 million passengers annually (nominally occurring in 2063)
Major development or Major airport development	A major airport development as defined in the Act
Major development plan (MDP)	A major development plan for an airport developed and approved in accordance with Division 3 of Part 5 of the Act
Master plan	A master plan for an airport developed and approved in accordance with Division 3 of Part 3 of the Act
'May include'	'May include but is not limited to'
Midfield	Area of an aerodrome that is contained between parallel runways and their associated parallel taxiway system
Movement area	That part of an airport used for the surface movement of aircraft, including manoeuvring areas and aprons
Peak month	Month of the year during which demand for aviation activity is highest
Regular Public Transport	A service consisting of regular public transport aircraft operations, as defined in the Civil Aviation Safety Regulations
Scoping Study	The joint Scoping Study of Rail Needs for Western Sydney
Stage 1 Capacity	The capacity described in section 3.1.1
Stage 1 Development or Stage 1	The developments described in Part 3
Stage 1 operations	The airport operating at the Stage 1 Capacity
Sydney basin	The Sydney basin is identified as the Sydney Greater Capital City Statistical Area, as defined by the Australian Bureau of Statistics. It is bordered by Sutherland and Bargo in the south, Lake Macquarie and the Hawkesbury River in the north and Mt Victoria in the west

Term	Meaning
Sydney West Airport	The Airport. Note: this is the name used in the Act. The Airport is also commonly known as Western Sydney Airport
Taxilanes	Taxilanes are defined as portions of the apron that are used for access between taxiways and aircraft parking positions
Taxiways	Taxiways are defined as paths at an aerodrome established for the taxiing of aircraft and intended to provide a ground movement link between one part of the aerodrome and another
Terminal and ground transport precincts	Includes the terminal and concourse building(s), and ground access network leading from the Airport perimeter to the ground transportation centre or other aviation related support facilities. This includes roads and rail lines
Turns	An aircraft turnaround is defined as the act or process in which passengers and freight are unloaded from an aircraft at the end of a trip and reloaded on to the aircraft for the next trip
Up-gauging	An increase in the aircraft size (e.g. B737 to A340) by an airline to increase the number of available seats for a flight destination in lieu of adding an additional flight segment during the day. This will result in an increase in passengers per aircraft movement
Western Sydney Airport (WSA)	The Airport. Under the Act the Airport is referred to as Sydney West Airport
Wi-Fi	Local area wireless communications networking technology

Acronyms and abbreviations

Acronym	Meaning
AHD	Australian Height Datum
ALC	Airport Lessee Company
ALER	Airfield lighting equipment room
ANEC	Australian Noise Exposure Concept
ANEF	Australian Noise Exposure Forecast
ARFFS	Aviation Rescue and Fire Fighting Services
ATC	Air traffic control
ATCT	Air traffic control tower
ATM	Air traffic movement
DME	Distance measuring equipment
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations 1998
EIS	Environmental Impact Statement
FSC	Full-service carriers
GBAS	Ground based augmentation system
GDP	Gross Domestic Product
GJ	Gigajoules
GSE	Ground support equipment
ha	Hectares
HIAL	High intensity approach lighting
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ILS	Instrument landing system
km and km/h	Kilometres and kilometres per hour
kV	Kilovolt
LCC	Low-cost carriers
LOC	Localiser
LOS	the level of service for the airport development as defined by IATA
m, m^2 and m^3	Metres, square metres and cubic metres
ML and ML/d	Megalitres and megalitres per day
MAP	Million annual passengers
MARS	Multiple aircraft ramp systems
MDP	Major development plan
MOS	Manual of Standards (MOS) – Part 139 Aerodromes
NASF	National Airports Safeguarding Framework

Acronym	Meaning
NAVAID	Navigational aid
OLS	Obstacle limitation surface
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations
RESA	Runway end safety area
PSZ	Public safety zone
RET	Rapid exit taxiway
RMS	NSW Roads and Maritime Services
RPT	Regular public transport
RVR	Runway visual range
ULD	Unit load devices
WSA	Western Sydney Airport
WSIP	Western Sydney Infrastructure Plan

Appendix B: Permissible Uses Definitions

These definitions apply for section 2.4 of the Airport Plan.

advertisement is a sign, notice, device or representation in the nature of an advertisement visible from any public place or public reserve.

advertising structure is a defined as a structure used or to be used principally for the display of an advertisement.

agriculture means any of the following:

a. aquaculture,
b. extensive agriculture;
c. intensive livestock agriculture;
d. intensive plant agriculture.

aircraft maintenance facility means a building or place used for the repair and fitting of accessories to aircraft or vehicles associated with airport operations; includes work involving body building, panel building, panel beating, spray painting and chassis restoration.

amusement centre means a building or place (not being part of a pub or registered club) used principally for playing:

a. billiards, pool or other like games; or
b. electronic or mechanical amusement devices, such as pinball machines, computer or video games and the like.

animal boarding means a building or place used for the boarding, training, keeping or care of animals, for purposes associated with the aviation operations of the Airport.

aquaculture has the same meaning as in the *Fisheries Management Act 1994* (NSW).

aviation activity means any activity for the arrival, departure, movement or operation of aircraft and includes aircraft aprons, helipads, heliports, runways, taxiways, navigational aids and the like.

aviation educational facility means any of the following:

a. a flying training school;
b. an aircraft maintenance training school;
c. a facility that provides training for cabin crew; or
d. any other facility with the primary purpose of providing training in relation to aviation related activities.

aviation support facility means any aircraft maintenance facility, engine run-up area, ground support equipment, airline catering facility, airline or other user office, transport depot, aircraft waste disposal facilities, animal boarding and animal training establishments for both commercial and regulator purposes and associated ground-based activities necessary for the orderly and efficient operation of aviation activity.

bulky goods premises means a building or place whose principal purpose is the sale, hire or display of bulky goods, being goods that are of such size or weight as to require:

a. a large area for handling, display or storage; and
b. direct vehicular access to the site of the building or place by members of the public for the purpose of loading or unloading such goods into or from their vehicles after purchase or hire;

and including goods, such as floor and window supplies, furniture, household electrical goods, equestrian supplies and swimming pools, but does not include a building or place used for the sale of foodstuffs or clothing unless their sale is ancillary to the sale or hire or display of bulky goods.

business premises means a building or place at or on which:

a. an occupation, profession or trade (other than an industry) is carried on for the provision of services directly to members of the public on a regular basis; or
b. a service is provided directly to members of the public on a regular basis;

and includes a funeral home and, without limitation, premises, such as banks, post offices, hairdressers, dry cleaners, travel agencies, internet access facilities and the like, but does not include the entertainment facility, home business, home occupation, home occupation (sex services), medical centre, restricted premises, sex services premises or veterinary hospital.

car park means a building or place primarily used for the purpose of parking motor vehicles, including any maneuvering space and access thereto, whether operated for gain or not.

catering facility means a building or place whose principal purpose is the preparation and packaging, on a wholesale basis, of food and drink to people for consumption on passenger aircraft.

child care centre means a building or place used for the supervision and care of children that:

a. provides long day care, pre-school care, occasional child care or out-of-school-hours care; and
b. does not provide overnight accommodation for children other than those related to the owner or operator of the centre;

but does not include:

c. a building or place used for home-based child care; or
d. an out-of-home care service provided by an agency or organisation accredited by the Children's Guardian; or
e. a baby-sitting, playgroup or child-minding service that is organised informally by the parents of the children concerned; or
f. a service provided for fewer than five children (disregarding any children who are related to the person providing the service) at the premises at which at least one of the children resides, being a service that is not advertised; or
g. a regular child-minding service that is provided in connection with a recreational or commercial facility (such as a gymnasium), by or on behalf of the person conducting the facility, to care for children while the children's parents are using the facility; or
h. a service that is concerned primarily with the provision of:

- lessons or coaching in, or providing for participation in, a cultural, recreational, religious or sporting activity; or
- private tutoring; or
- a school; or
- a service provided at exempt premises (within the meaning of Chapter 12 of the *Children and Young Persons (Care and Protection) Act 1998*) (NSW), such as hospitals, but only if the service is established, registered or licensed as part of the institution operating on those premises.

convenience store means premises used for the purposes of selling small daily convenience goods, such as foodstuffs, personal care products, newspapers and the like to provide for the day-to-day needs of people who live or work in the local area, and may include ancillary services, such as a post office, bank or dry cleaning.

detention basin means a storage basin used to temporarily detain storm or flood waters, to reduce or attenuate the peak discharge within a drainage system or a biobasin.

earthworks means excavation or filling.

entertainment facility means a theatre, cinema, music hall, concert hall, dance hall and the like, but does not include a pub or registered club.

environmental protection works means works associated with the rehabilitation of land towards its natural state or any work to protect land and natural waterways from environmental degradation, and includes bush regeneration and revegetation works (including seed collection and vegetation propagation activities), weed control and eradication, waterways protection works (including pollution control and flow control works), erosion and stream bank stability protection works, and any other works required or permitted by the environmental management framework in accordance with the EIS Airport Environmental Strategy.

extensive agriculture means any of the following:

a. the production of crops or fodder (including irrigated pasture and fodder crops) for commercial purposes;
b. the grazing of livestock for commercial purposes;
c. bee keeping; or
d. a dairy (pasture based).

extractive industry means industry concerned with the winning or removal of extractive materials (other than from a mine) by methods, such as excavating, dredging, tunnelling or quarrying, including the storing, stockpiling or processing of extractive materials by methods, such as recycling, washing, crushing, sawing or separating and also includes concrete and asphalt batching, but does not include turf farming.

food and drink premises means premises that are used for the preparation and retail sale of food or drink (or both) for immediate consumption on or off the premises, and includes any of the following:

a. a restaurant or café;

b. takeaway food and drink premises;
c. a small bar; or
d. a pub.

freight handling and transport facility means a facility used principally for the bulk handling, storage of goods and materials, including pending sale, for transport by road, rail, air or sea, including any facility for the loading and unloading of vehicles, aircraft, vessels or containers used to transport those goods and for the parking, holding, servicing or repair of those vehicles, aircraft or vessels or for the engines or carriages involved, and includes a transport depot.

health care professional means any person registered under an Act for the purpose of providing health care.

heavy industry means a building or place used to carry out an industrial activity that requires separation from other development because of the nature of the processes involved, or the materials used, stored or produced.

heritage conservation works includes preservation, protection, maintenance, restoration and adaptation of heritage items to protect heritage values, including interpretive displays and activities that will allow for the reburial of Aboriginal objects.

hotel or motel accommodation means accommodation at a building or place (whether or not licensed premises under the *Liquor Act 2007* (NSW) that provides temporary or short-term accommodation on a commercial basis and that:

a. comprises rooms or self-contained suites; and
b. may provide meals to guests or the general public and facilities for the parking of guests' vehicles;

but does not include backpackers' accommodation, a boarding house, bed and breakfast accommodation or farm stay accommodation.

industrial retail outlet means a building or place that:

a. is used in conjunction with an industry or rural industry;
b. is situated on the land on which the industry or rural industry is located; and
c. is used for the display or sale (whether by retail or wholesale) of only those goods that have been manufactured on the land on which the industry or rural industry is located;

but does not include a warehouse or distribution centre.

industry means any of the following:

a. general industry;
b. heavy industry; or
c. light industry;

but does not include rural industry, extractive industry, or mining.

intensive livestock agriculture means the keeping or breeding, for commercial purposes, of cattle, poultry, pigs, goats, horses or other livestock that are fed wholly or substantially on externally sourced feed, and includes any of the following:

a. dairies (restricted);
b. feedlots;
c. piggeries; or
d. poultry farms;

but does not include extensive agriculture, aquaculture or the operation of facilities for drought or similar emergency relief.

intensive plant agriculture means any of the following:

a. the cultivation of irrigated crops for commercial purposes (other than irrigated pasture or fodder crops);
b. horticulture;
c. turf farming; or
d. viticulture.

kiosk means premises that are used for the purposes of selling food, light refreshments and other small convenience items, such as newspapers.

landscaping material supplies means a building or place used for the storage and sale of landscaping supplies, such as soil, gravel, potting mix, mulch, sand, railway sleepers, screenings, rock and the like.

light industry means a building or place used to carry out an industrial activity that does not interfere with the amenity of the neighbourhood by reason of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, wastewater, waste products, grit or oil, or otherwise, and includes high technology industry and home industry.

liquid fuel depot and distribution facility means storage, distribution, inspection, repair, servicing and retail premises that provide petrol, oil, petroleum, other flammable liquids, ancillary merchandise and services for aircraft and airport vehicles.

market means an open-air area, or an existing building, that is used for the purpose of selling, exposing or offering goods, merchandise or materials for sale by independent stall holders, and includes temporary structures and existing permanent structures used for that purpose on an intermittent or occasional basis.

medical centre means premises that are used for the purpose of providing health services (including preventative care, diagnosis, medical or surgical treatment, counselling or alternative therapies) to out-patients only, where such services are principally provided by health care professionals. It may include the ancillary provision of other health services.

navigational aids means any aircraft surveillance equipment, control towers, radars, visual and non-visual navigational aids and the like.

office premises means a building or place used for the purpose of administrative, clerical, technical, professional or similar activities that do not include dealing with members of the public on a direct and regular basis, except where such dealing is a minor activity (by appointment) that is ancillary to the main purpose for which the building or place is used.

parking space means a space dedicated for the parking of a motor vehicle, including any manoeuvring space and access to it, but does not include a car park.

passenger transport facility means a building or place used for the assembly or dispersal of passengers by any form of transport, including facilities required for parking, manoeuvring, storage or routine servicing of any vehicle that uses the building or place.

pub means licensed premises under the *Liquor Act 2007* (NSW), the principal purpose of which is the retail sale of liquor for consumption on the premises, whether or not the premises include hotel or motel accommodation and whether or not food is sold or entertainment is provided on the premises.

public administration facility means a facility used by a government agency for purposes related to the government agency exercising its functions at the Airport.

public utility undertaking means any of the following undertakings carried on or permitted to be carried on by or by authority of any government department or under the authority of or in pursuance of any Commonwealth or State Act:

a. railway, road transport, air transport;
b. telecommunications facility;
c. undertakings for the supply of water, electricity, fuel or gas or the provision of sewerage or drainage services;

and a reference to a person carrying on a public utility undertaking includes a reference to a council, electricity supply authority, government department, corporation, firm or authority carrying on the undertaking.

recreation facility (indoor) means a building or place used predominantly for indoor recreation, whether or not operated for the purposes of gain, including a squash court, indoor swimming pool, gymnasium, table tennis centre, health studio, bowling alley, ice rink or any other building or place of a like character used for indoor recreation, but does not include an entertainment facility, a recreation facility (major) or a registered club.

recreation facility (major) means a building or place used for large-scale sporting or recreation activities that are attended by large numbers of people whether regularly or periodically, and includes sports stadiums, showgrounds, racecourses and motor racing tracks.

registered club means a club that holds a club licence under the *Liquor Act 2007* (NSW).

restaurant or café means a building or place the principal purpose of which is the preparation and serving, on a retail basis, of food and drink to people for consumption on the premises, whether or not liquor, takeaway meals and drinks or entertainment are also provided.

restricted premises means business premises or retail premises that, due to their nature, restrict access to patrons or customers over 18 years of age, and includes sex shops and similar premises.

retail premises means a building or place used for the purpose of selling items by retail, or hiring or displaying items for the purpose of selling them or hiring them out, whether the items are goods or materials (or whether also sold by wholesale), and includes any of the following:

a. amusement centre;
b. bulky goods premises;
c. cellar door premises;
d. convenience store;
e. entertainment facility;
f. food and drink premises;
g. industrial retail outlet;
h. garden centres;
i. hardware and building supplies;
j. kiosks;
k. landscaping material supplies;
l. markets;
m. plant nurseries;
n. roadside stalls;
o. rural supplies;
p. shops;
q. timber yards;
r. vehicle sales or hire premises; or
s. wholesale supplies;

but does not include highway service centres, service stations or restricted premises.

retail – low intensity means a building or place used for the purpose of selling items by retail, or displaying items for the purpose of selling them or hiring them out, whether the items are goods or materials (or whether also sold by wholesale), and only includes the following types of retail premises:

a. garden centres;
b. hardware and building supplies;
c. landscaping material supplies;
d. markets – local produce;
e. plant nurseries;
f. rural supplies;
g. timber yards; or
h. wholesale supplies.

road means a public road or a private road within the meaning of the *Roads Act 1993* (NSW), and includes a classified road.

service station means a building or place used for the sale by retail of fuels and lubricants for motor vehicles, whether or not the building or place is also used for any one or more of the following:

a. the ancillary sale by retail of spare parts and accessories for motor vehicles;
b. the cleaning of motor vehicles;
c. installation of accessories;
d. inspecting, repairing and servicing of motor vehicles (other than body building, panel beating, spray painting, or chassis restoration); or
e. the ancillary retail selling or hiring of general merchandise or services or both.

shop means premises that sell merchandise, such as groceries, personal care products, clothing, music, homewares, stationery, electrical goods or the like or that hire any such merchandise, and includes a neighbourhood shop, but does not include food and drink premises or restricted premises.

signage means any sign, notice, device, representation or advertisement that advertises or promotes any goods, services or events and any structure or vessel that is principally designed for, or that is used for, the display of signage, and includes any of the following:

a. an advertising structure;
b. a building identification sign; or
c. a business identification sign;

but does not include a traffic sign or traffic control facilities.

self-storage units means premises that consist of individual enclosed compartments for storing goods or materials (other than hazardous or offensive goods or materials).

storage premises means a building or place used for the storage of goods, materials, plant or machinery for commercial purposes and where the storage is not ancillary to any industry, business premises or retail premises on the same parcel of land, and includes self-storage units, but does not include a heavy industrial storage establishment or a warehouse or distribution centre.

takeaway food and drink premises means premises that are predominantly used for the preparation and retail sale of food or drink (or both) for immediate consumption away from the premises.

telecommunications facility means:

a. any part of the infrastructure of a telecommunications network;
b. any line, cable, optical fibre, fibre access node, interconnect point equipment, apparatus, tower, mast, antenna, dish, tunnel, duct, hole, pit, pole or other structure in connection with a telecommunications network; or
c. any other thing used in or in connection with a telecommunications network.

temporary structure includes a booth, tent or other temporary enclosure (whether or not part of the booth, tent or enclosure is permanent), and also includes a mobile structure.

terminal means services and facilities within the terminal building for passengers, airport staff and freight of a kind usually provided within an airport terminal building, including food and drink premises, kiosks, shops, airline lounges, medical centres, transfer corridors, business premises, office premises, retail premises, passenger transport facility, public administration facility, vehicle hire premises and facilities for the conduct of events, functions, conferences and the like.

transfer corridor means the provision of an area for the facilitation of inter- or intra- terminal transfers of passengers or baggage.

transport depot means a building or place used for the parking or servicing of motor powered or motor drawn vehicles used in connection with a business, industry, shop or passenger or freight transport undertaking.

vehicle sales premises means a building or place used for the display or sale of motor vehicles, caravans, boats, trailers, agricultural machinery and the like, whether or not accessories are sold or displayed there.

vehicle hire premises means a place used for the hire of motor vehicles, caravans and the like, including maintenance and repair of these vehicles.

warehouse and distribution centre means a building or place used mainly or exclusively for storing or handling items (whether goods or materials) pending their sale, but from which no retail sales are made.

waste disposal facility means a building or place used for the disposal of waste by landfill, incineration or other means, including such works or activities as recycling, resource recovery and other resource management activities, energy generation from gases, leachate management, odour control and the winning of extractive material to generate a void for disposal of waste or to cover waste after its disposal.

waste or resource management facility means any of the following:

a. a waste disposal facility;
b. a waste or resource transfer station; or
c. a building or place that is a combination of any of the things referred to in paragraphs (a) and (b).

waste or resource transfer station means a building or place used for the collection and transfer of waste material or resources, including the receipt, sorting, compacting, temporary storage and distribution of waste or resources and the loading or unloading of waste or resources onto or from road or rail transport.

wholesale supplies means a building or place used for the display, sale or hire of goods or materials by wholesale only to businesses that have an Australian Business Number registered under the *A New Tax System (Australian Business Number) Act 1999* (Commonwealth).

works depot means a building or place used for the storage (but not sale or hire), maintenance, repair and refueling of plant, machinery or other goods that support the operations of an existing undertaking, including construction, when not required for use. This includes ancillary temporary office facilities and amenities supporting such a depot.