



Australian Government

**Department of Infrastructure, Transport,
Regional Development, Communications and the Arts**

Western Sydney International (Nancy-Bird Walton) Airport – Airspace and flight path design

Environmental Impact Statement

Technical paper 6: Land use and planning

October 2024



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Terms and abbreviations

Term/abbreviation	Definition
2016 WSI EIS	The earlier Western Sydney International Airport Environmental Impact Statement
ABS	Australian Bureau of Statistics
Aerotropolis	Western Sydney Aerotropolis
Airports Act	<i>Airports Act 1996 (Cth)</i>
Airspace EIS	Western Sydney International Airport - Airspace and Flight Path Design Environmental Impact Statement
ANEC	Australian Noise Exposure Concept
ANEF	Australian Noise Exposure Forecast
AS 2021:2015	Australian Standard-Acoustics- Aircraft Noise Intrusion- Building Siting and construction. Guidance on building controls for the siting and construction of buildings in relation to aircraft noise.
CASA	Civil Aviation Safety Authority
CBD	Central Business District
CNS	Communication Navigation and Surveillance
Conditionally acceptable	In the context of AS 2021:2015, conditionally acceptable details that the development will need further implementation of the provisions within the standard to allow the development to occur.
DCP	Development Control Plan
DITRDCA	Department of Infrastructure, Regional Development, Communications and the Arts
DPE	The former NSW Department of Planning and Environment. The planning functions of this agency are now within the Department of Planning, Housing and Infrastructure
DPHI	NSW Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999 (Cth)</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2021(NSW)</i>
GBMA	Greater Blue Mountains Area (World Heritage property)
LEP	Local Environmental Plan
LGA	Local Government Area
Minister's Guidelines	Guidelines for the Content of an Environmental Impact Statement – Western Sydney Airport (Finalised 26 April 2022)
NASF	National Airports Safeguarding Framework

Term/abbreviation	Definition
OLS	Obstacle limitation surface
PAAM	Plan for Aviation Airspace Management
PANS-OPS	Procedures for air navigation services – aircraft operations
SEPP	State Environmental Planning Policy
Technical paper	Planning and Land Use Technical paper (this paper)
TfNSW	Transport for NSW
WSA	Western Sydney Airport (the operator of WSI)
WSI	Western Sydney International (Nancy-Bird Walton) Airport

Executive summary

This technical paper provides an overview of the existing planning framework and land uses in the vicinity of Western Sydney International (Nancy-Bird Walton) Airport (WSI) and assesses the potential impact to existing and future land use that may occur during operation of the project.

The project (the subject of this assessment) consists of the development and implementation of proposed flight paths and a new controlled airspace volume for single runway operations at WSI. The project also includes the associated air traffic control and noise abatement procedures for eventual use by civil, commercial passenger and freight aircraft. The airspace and flight paths would be managed by the Air Navigation Services Provider (ANSP), Airservices Australia.

The project involves flight paths for all-weather operations on Runway 05 and Runway 23 during the day (5:30 am to 11 pm) and night (11 pm to 5:30 am), as well as head-to-head Reciprocal Runway Operations (RRO) during night time periods (when meteorological conditions and low flight demand permit) to minimise the number of residences subjected to potential noise disturbance. For further information on the runway modes of operation for WSI refer to Chapter 7 (The project) in the EIS.

The study area for the assessment comprises the land surrounding WSI where aircraft movements would have an impact on land uses through implementation of planning restrictions on future development. The Obstacle Limitation Surface (OLS) has been identified as the most suitable boundary to assess potential impacts and forms the basis of the study area.

The study area encompasses an area of Western Sydney, where growth is being driven by major infrastructure growth areas and land use initiatives. Western Sydney International and Aerotropolis will be the key catalyst for driving further growth and development in the region.

Key land uses within the study area, subject to this assessment include residential, agricultural, recreational, industrial, commercial, health and education. Aside from WSI, Defence Establishment Orchard Hills (DEOH) is the dominant Commonwealth Land parcel within the study area and is located to the north of WSI.

There are several International and Australian publications and policies which provide strategic guidance on land use management in the proximity to airport operations. The National Airports Safeguarding Framework (NASF) in particular, provides guidance on planning requirements for developments that could potentially affect aviation operations including (but not limited to) measures for managing impacts of aircraft noise, managing risks of intrusion into protected airspace and managing risks of wildlife strike near airports.

The assessment of land use impacts is based on the potential for 3 key aspects of the project and how they affect key land uses in the study area:

- aircraft noise, and the impact they could have on existing land use and future planning or approvals
- the potential for restricted development due to protected airspace (OLS and PANS-OPS)
- wildlife buffers and framework for how to manage the risk of wildlife strike on aircrafts in the vicinity of WSI.

The NSW planning framework takes a precautionary approach to residential land use in regard to WSI operations and has adopted an approach which relies on ANEC/ANEF contours and Australian Standard AS2021:2015 Acoustics – Aircraft Noise Intrusion Building Siting and Construction (AS2021:2015) to inform planning decisions for residential land uses in areas affected by aircraft noise.

The Western Parkland City SEPP outlines that no noise sensitive development (including residential development) will be permitted within the ANEC 20 and above contours. A development could be considered ‘conditionally acceptable’ based achieving internal noise goals set by AS 2021:2015, where the development was lawfully commenced at the time of the rezoning under the Western Parkland SEPP. A small additional area of land in the vicinity of WSI is predicted to be within the 20 ANEC contour for the assessed noise scenarios, when reviewed in comparison to the published ANEC mapping within the Western Parkland City SEPP.

Western Sydney International's (WSI) protected airspace was prescribed by declaration on 19 October 2017. Land use controls associated with OLS ensure that developments around airports do not impede on airspace and that planning authorities consider airspace requirements when determining applications surrounding WSI. Future developments with the potential to exceed the OLS must be referred to the WSI operator and DITRDCA for review prior to the development being approved to proceed.

The PANS-OPS surface is generally above the OLS and is designed to safeguard an aircraft from collision with obstacles when the aircraft's flight may be guided solely by instruments, in conditions of poor visibility. A PANS-OPS for WSI will be prepared once flight paths have been finalised.

NASF Guideline C provides a framework for how to manage the risk of wildlife strike on aircrafts. That framework has been incorporated into the Western Parkland City SEPP and Aerotropolis Precinct Plans. Land use planning around WSI has incorporated the implementation of wildlife buffer zones to mitigate risks of wildlife hazards. There are a range of existing land uses within the study area which have the potential to attract wildlife. These existing land uses can continue in the future due to existing use rights however mitigation of potential wildlife risks may be required in consultation with WSI and NSW Department of Planning, Housing and Infrastructure (DPHI). Any new development classed as 'relevant development' under the SEPP and within the 13 kilometre wildlife buffer of WSI will be subject to the wildlife management controls contained within the Western Parkland City SEPP.

Land use planning in the vicinity of WSI has considered and incorporated the operational needs of WSI into land use planning in accordance with guidance provided in the NASF. DITRDCA (formally Department of Infrastructure and Regional Development (DIRD)) undertook liaison with relevant state and local agencies to seek adoption of the necessary guidelines in applicable State environmental planning instruments. The range of existing planning controls in place in the vicinity of WSI have been an effective means of providing appropriate controls over land use planning and development.

Further, project-specific mitigations have been identified, including continuing liaison between DITRDCA and State and local government agencies to ensure applicable environmental planning instruments have regard to any changes to WSI's protected airspace and for ANEC forecasts produced for the project.

Chapter 1 Introduction

This chapter provides an overview of the proposed airspace and flight path design for the Western Sydney International (Nancy-Bird Walton) Airport (WSI). This includes the background to WSI and its accompanying airspace and flight path design (the project) which impacts on the existing Sydney Basin airspace. It describes the key features and objectives of the project and identifies the purpose and structure of this technical paper.

1.1 Western Sydney International (Nancy-Bird Walton) Airport

1.1.1 Background

In 2016, the then Australian Minister for Urban Infrastructure approved development for a new airport for Western Sydney, now known as the Western Sydney International (Nancy-Bird Walton) Airport (WSI), under the *Airports Act 1996* (Commonwealth). The site of the new airport (the Airport Site) covers approximately 1,780 hectares (ha) at Badgerys Creek, as shown in Figure 1.1. The Airport Site is located within the Liverpool local government area (LGA).

Following the finalisation of the *Western Sydney Airport – Environmental Impact Statement* (2016 EIS), the Western Sydney Airport – Airport Plan (Airport Plan) was approved in December 2016. The Airport Plan authorised the construction and operation of the Stage 1 Development. It also set the requirements for the further development and assessment of the preliminary airspace design for WSI. The Australian Government has committed to developing and delivering WSI by the end of 2026.

The 2016 approval provided for the on-ground development of Stage 1 Development of WSI (a single runway and terminal facility capable of initially handling up to 10 million passengers per year) utilising indicative ‘proof of concept’ flight paths. These flight paths, presented in the 2016 EIS demonstrated that WSI could operate safely and efficiently in the Sydney Basin. WSI will be a 24-hour international airport and will:

- cater for ongoing growth in demand for air travel, particularly in the rapidly expanding Western Sydney region, as well as providing additional aviation capacity in the Sydney region more broadly
- provide a more accessible and convenient international and domestic airport facility for the large and growing population of Western Sydney
- provide long term economic and employment opportunities in the surrounding area
- accelerate the development of critical infrastructure and urban development.

The Australian Government has committed to developing and delivering WSI by the end of 2026.

The design and assessment process for the next phase of the airspace design (referred to as the preliminary airspace design) was set by Condition 16 of the Airport Plan. This included the future airspace design principles and the establishment of an Expert Steering Group. Key to these design principles was the need to minimise the impact on the community and other airspace users while maximising safety, efficiency and capacity of WSI and the Sydney Basin airspace. The airspace design must also meet the requirements of Airservices Australia and civil aviation safety regulatory standards.

Led by the Australian Government Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA), the Expert Steering Group has developed the preliminary flight paths and airspace arrangements for WSI (the project). The preliminary airspace design is the subject of the EIS.

1.1.2 The Airport

1.1.2.1 Stage 1 Development

The Stage 1 Development of WSI has been approved and is limited to single runway operations. It will handle up to 10 million annual passengers and around 81,000 air traffic movements per year by 2033 including freight operations (a movement being a single aircraft arrival or departure). Single runway operations are expected to reach capacity at around 37 million annual passengers and around 226,000 air traffic movements per year in 2055.

The approval provides for the construction of the aerodrome (including the single runway), terminal and landside layout and facilities, and ground infrastructure such as the instrument landing systems and high intensity approach lighting arrays. Construction of the Stage 1 Development commenced in 2018. Figure 1.2 shows location of the single runway within the Airport Site.

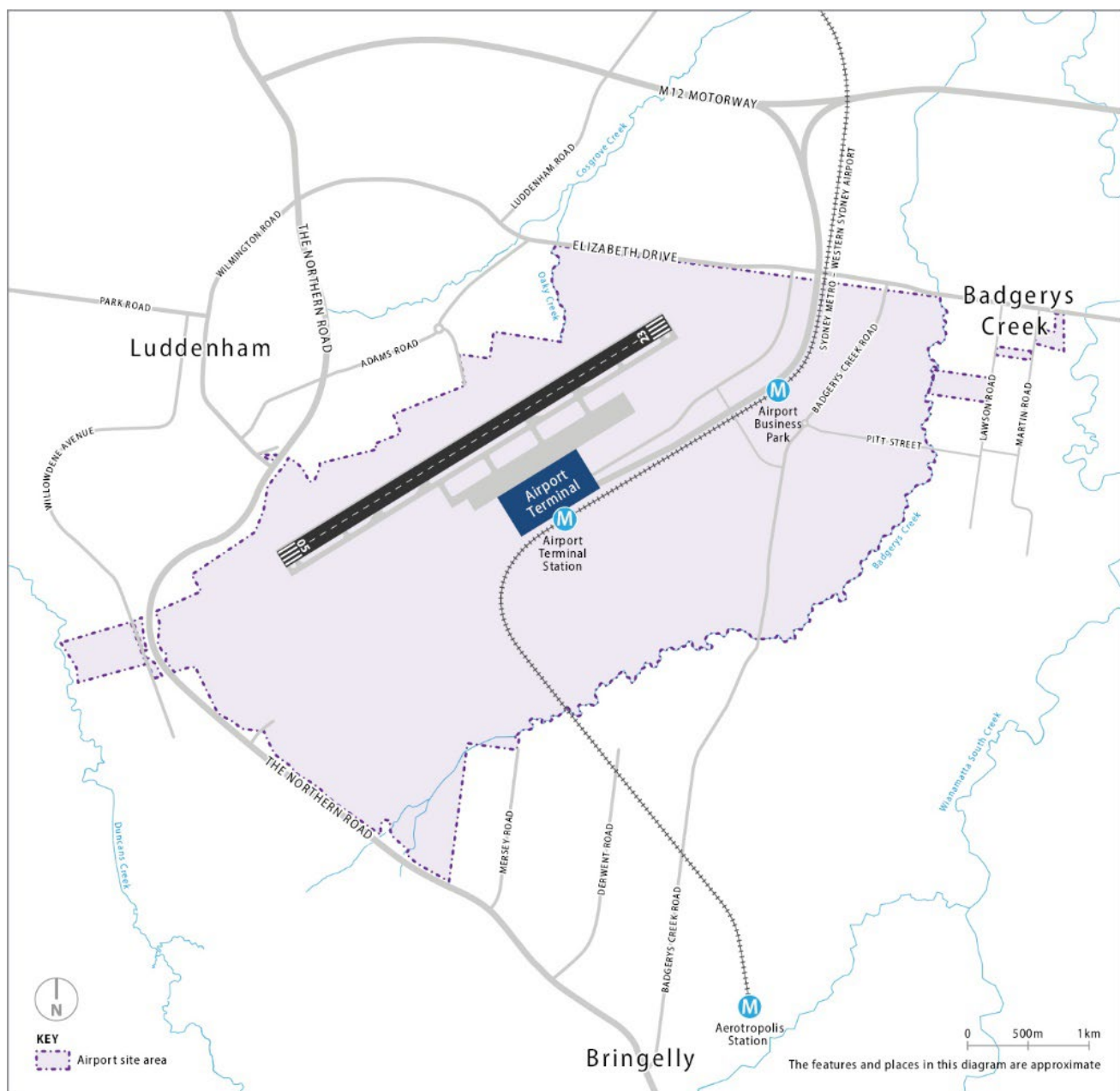


Figure 1.2 Western Sydney International Stage 1 Development

1.2 The project

The project consists of the development and implementation of proposed flight paths and a new controlled airspace volume for single runway operations at WSI. The project also includes the associated air traffic control and noise abatement procedures for eventual use by civil, commercial passenger and freight aircraft. The airspace and flight paths would be managed by the Air Navigation Services Provider (ANSP), Airservices Australia.

The project involves flight paths for all-weather operations on Runway 05 and Runway 23 during the day (5:30 am to 11 pm) and night (11 pm to 5:30 am), as well as head-to-head Reciprocal Runway Operations (RRO) during night-time periods (when meteorological conditions and low flight demand permit) to minimise the number of residences subjected to potential noise disturbance.

The flight paths differ during the day and night. Flight paths at night differ to take advantage of the additional airspace capacity offered when the curfew for Sydney (Kingsford Smith) Airport is in force. The proposed flight paths (as exhibited) are depicted in Figure 1.3 to Figure 1.7.

The project does not include any physical infrastructure or construction work.

Since the exhibition of the Draft EIS, refinements to the project have been incorporated into the preliminary flight path design. The final preliminary flight path design is presented in Chapter 7 (The project) of the EIS.

1.2.1 Objectives of the project

The overall objectives for WSI are to:

- improve access to aviation services for Western Sydney
- resolve the long-term aviation capacity constraints in the Sydney Basin
- maximise the economic benefit for Australia by maximising the value of the Airport as a national asset
- optimise the benefit of WSI for employment and investment in Western Sydney
- deliver sound financial, environmental and social outcomes for the Australian community.

The project will assist in achieving these overall objectives as it would enable single runway operations to commence at WSI through the introduction of new flight paths and a new controlled airspace volume.

The Western Sydney Airport Plan sets out 12 airspace design principles that the design process is required to follow. The principles were informed by and reflect community and industry feedback on the 2016 EIS. The principles seek to maximise safety, efficiency and capacity, while minimising impacts on the community and the environment. For further information on the airspace design principles refer to Chapter 6 (Project development and alternatives) in the EIS.

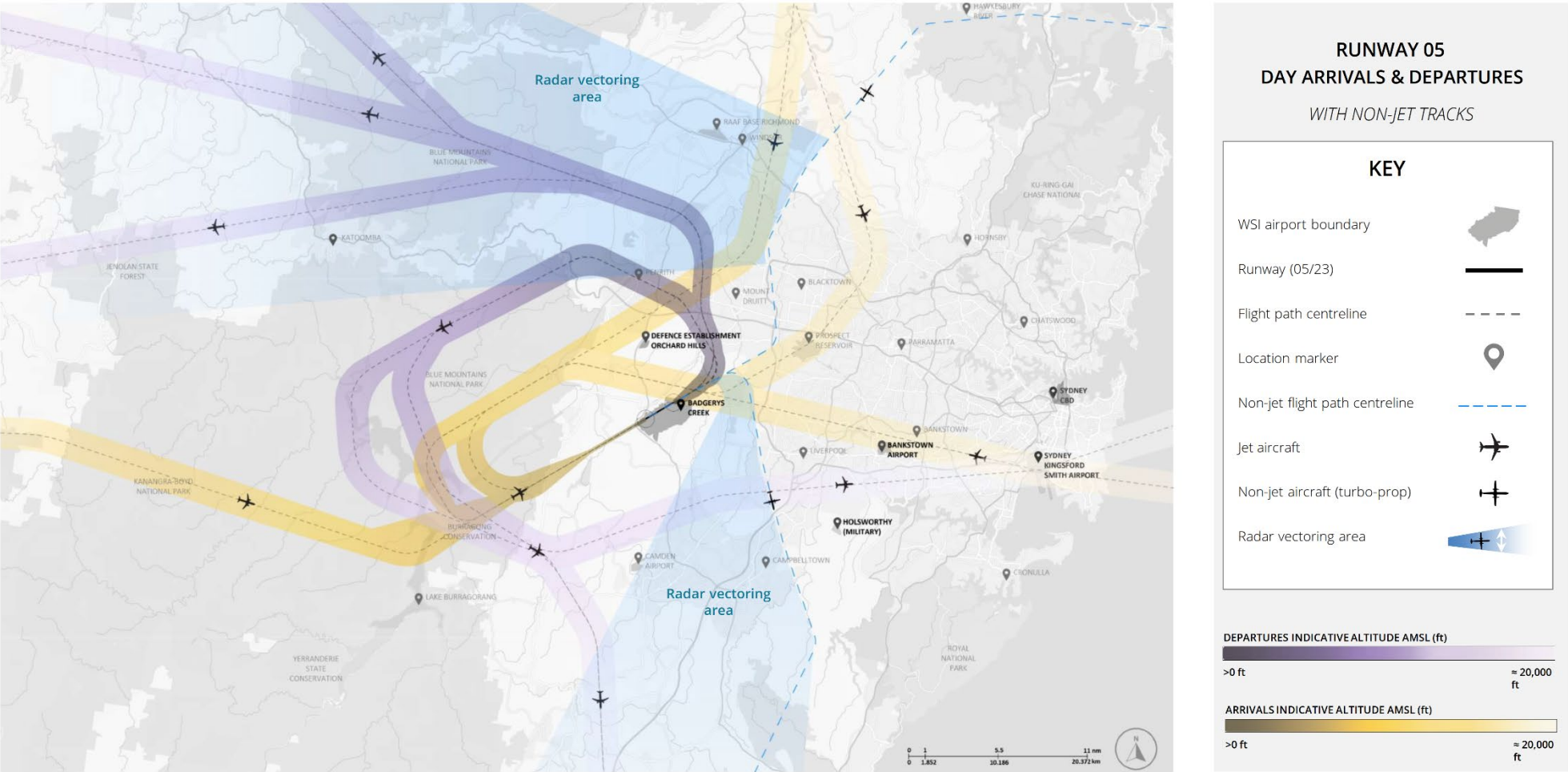


Figure 1.3 Proposed flight paths for Runway 05 (day)

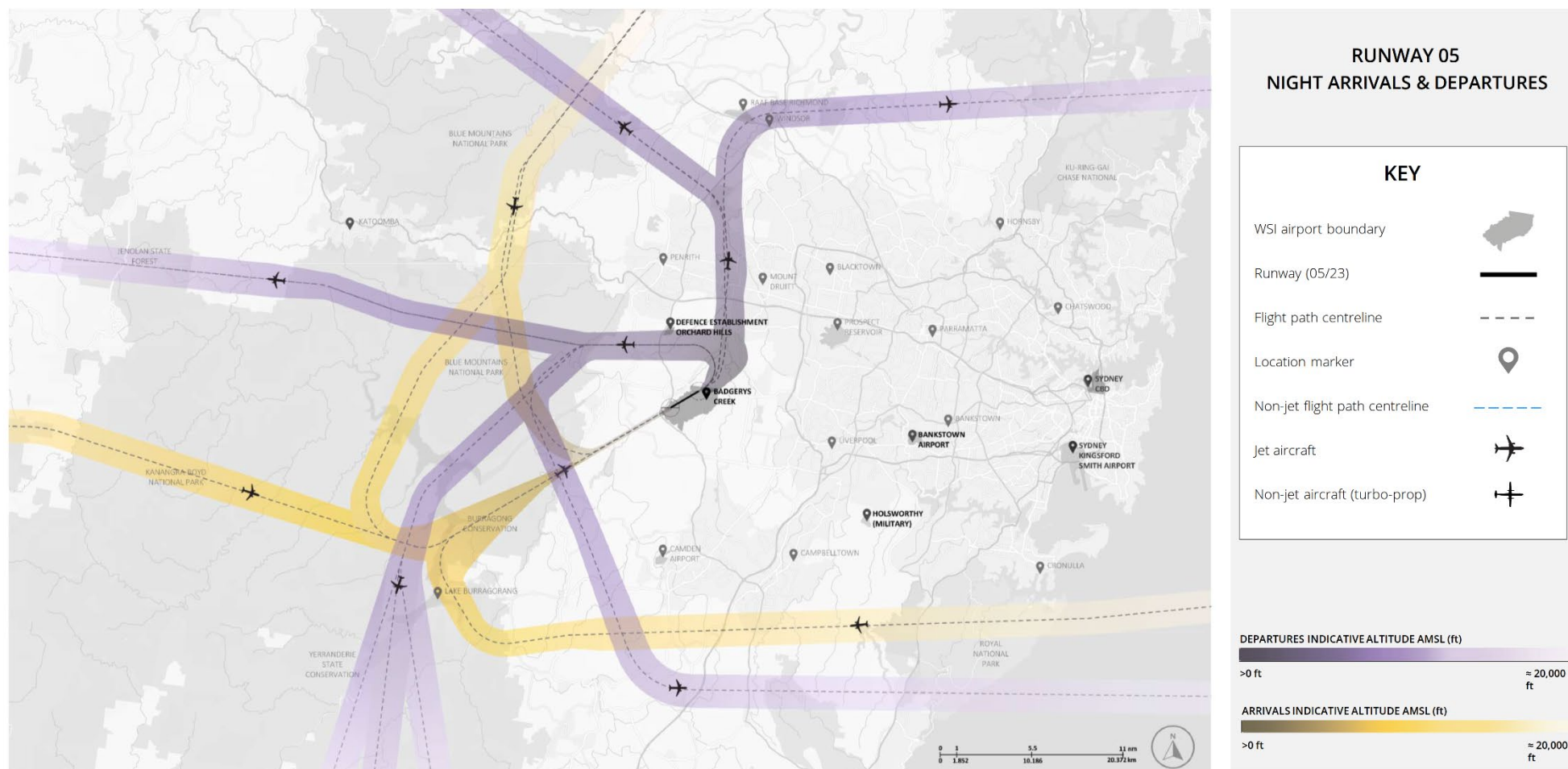


Figure 1.4 Proposed flight paths for Runway 05 (night)

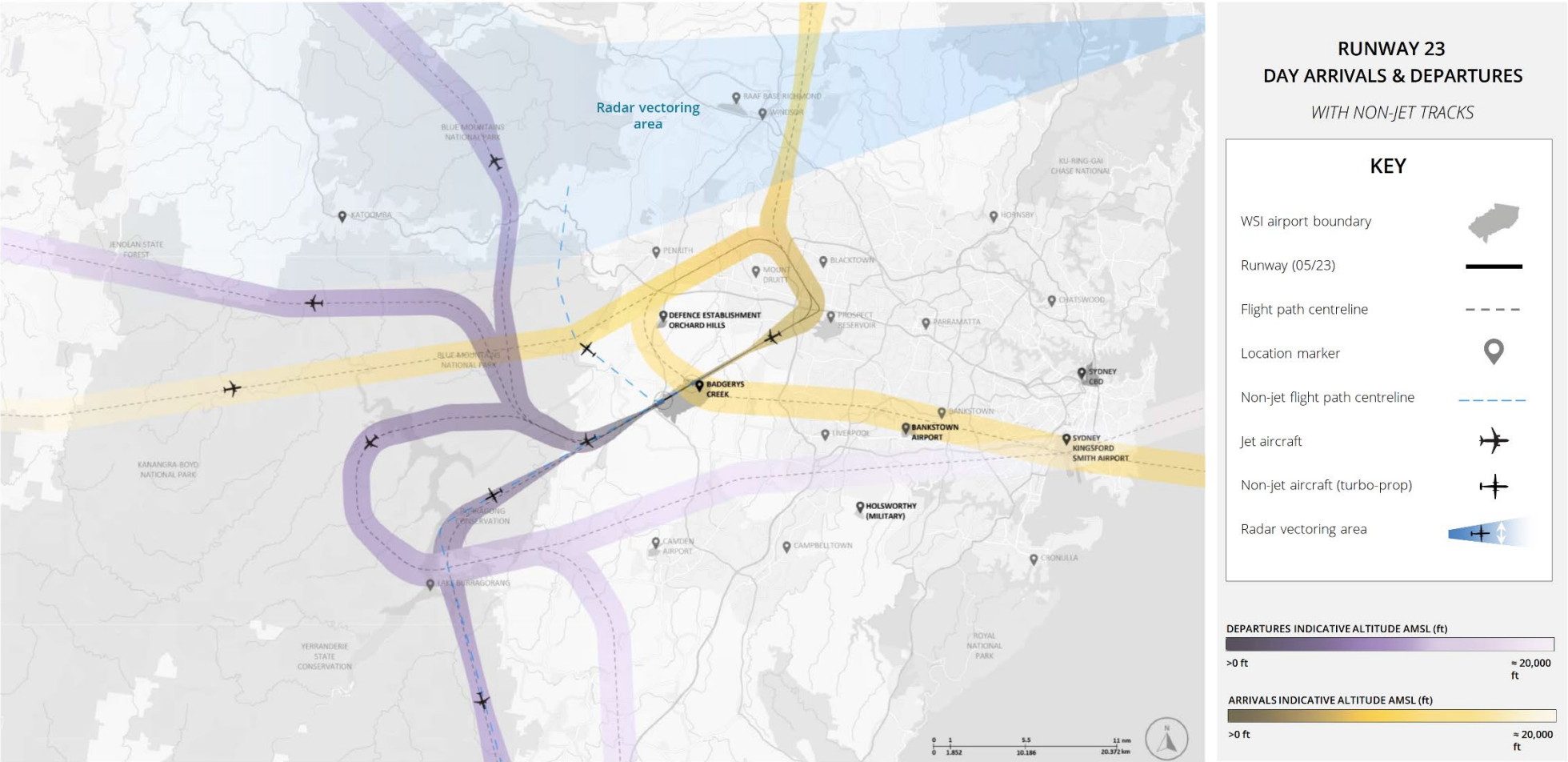


Figure 1.5 Proposed flight paths for Runway 23 (day)

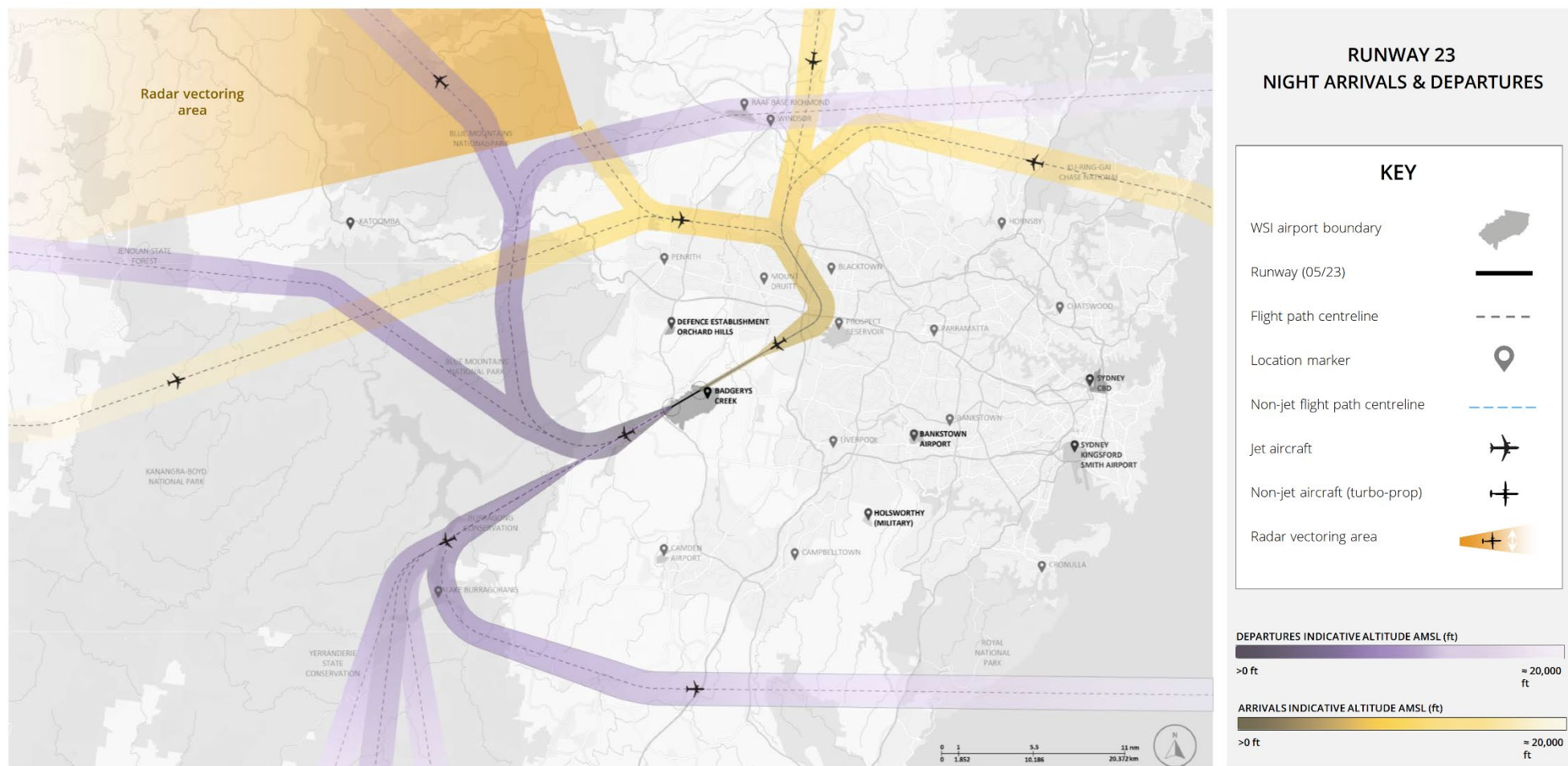


Figure 1.6 Proposed flight paths for Runway 23 (night)

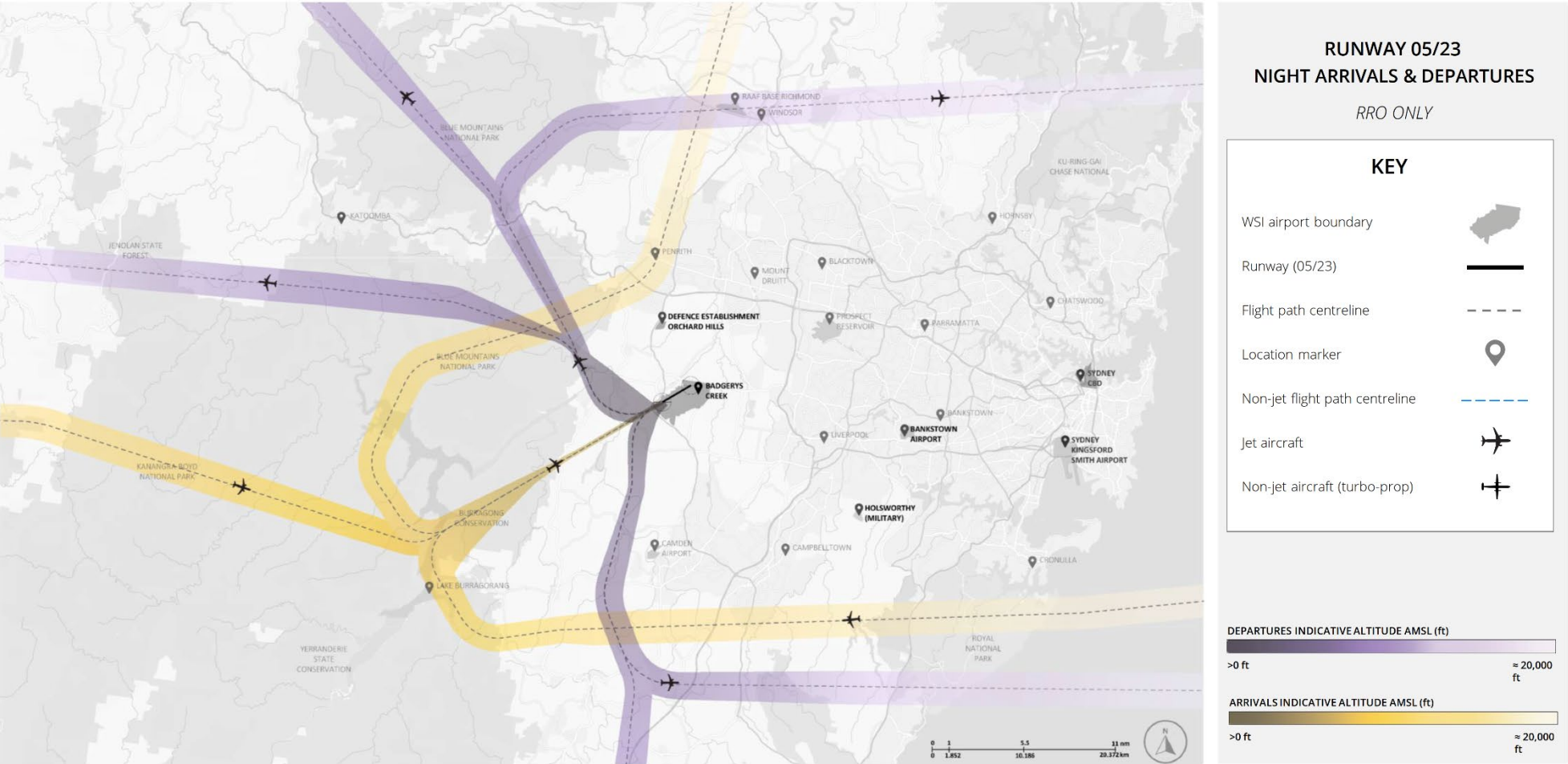


Figure 1.7 Proposed flight paths for Runway 05/23 (night)

1.3 Purpose of this technical paper

This technical paper has been prepared to inform the EIS for the project and to document the process and outcomes of the assessment of potential land use and planning impacts that may occur during operation of the project. The assessment has been prepared to address the EIS Guidelines (EPBC 2022/9143 issued 26 April 2022).

This assessment focusses on potential land use implications associated with airspace movements as well as land use impacts as a result of safeguarding measures for WSI overflight operations, having regard to the design of the proposed airspace. The assessment considers the following:

- the relevant statutory planning framework, including Commonwealth and NSW legislation, planning controls and strategic planning frameworks applying to land within the study area (Chapter 2) affected by airspace operations and aircraft noise
- interactions with other key assessments carried out for the EIS to consider land use planning aspects inform, and are informed by, all other relevant aspects of the EIS, including aircraft noise (Section 1.7)
- a description of the existing environment, including characteristics of land uses within the study area and identifying key land uses that could potentially be affected by the project (Chapter 3)
- a discussion on Commonwealth land in the study area (Section 3.2.7)
- an assessment of impacts the project may have on land use of the study area (Chapter 4)
- proposed management and mitigation measures (Chapter 5).

In terms of the land use impacts associated with the broader development of the airport (including land use within the WSI, and impacts associated with ground-based airport activities), the 2016 EIS and supporting *Technical Paper: Planning and Land Use Impact Assessment* (RPS 2016) remain the relevant source of information.

As identified in Section 1.2, refinements to the project have been incorporated into the preliminary flight path design. The assessment of these changes has been presented in Chapter 24 (Refinements since exhibition of the EIS) of the Submissions Report and incorporated into the EIS.

1.3.1 Assessment requirements

The project was referred to the Minister for the Environment and Water in 2021 (EPBC 2022/9143) in accordance with Section 161 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) and Condition 16 of the Airport Plan. In response, the delegate for the Minister for the Environment and Water determined that an EIS would be required and issued the EIS Guidelines on 26 April 2022.

This technical paper has been prepared to address the requirements related to land use and planning outlined in Table 1.1.

Table 1.1 EIS requirements - land use and planning

Reference	Summary of requirements	Where addressed in this technical paper
6.0 – Description of the environment	<p>The EIS must include a description of the environment, land uses and character of the proposal site and the surrounding areas that may be affected by the action. It must include the following:</p> <p>(b) details of current and historical land use of the area, and proposed urban, industrial, rural and tourism activities within areas that may be affected by the proposal.</p> <p>(e) Identify any Commonwealth lands relevant to the impacts of the action. If sites are identified, provide a description of the land, current usage and ownership (if known), along with any listed Commonwealth heritage sites and other relevant components of the environment on Commonwealth land.</p>	<p>Chapter 3 describes the existing environment of the study area.</p> <p>Section 3.2.7 discusses Commonwealth Land within the study area.</p>
7.1 – Describe and assess relevant Impacts	<p>The EIS must include a description of all the relevant impacts of the action (including direct, indirect, facilitated and cumulative), including the magnitude, duration and frequency of the impacts.</p>	<p>Chapter 4 provides an assessment of potential impacts.</p>
7.4 – People and communities	<p>Detailed assessment of impacts that the proposed action may facilitate on people and communities. Including, but not limited to:</p> <ul style="list-style-type: none"> change in land use. <p>This should be based on relevant metrics such as the Australian Noise Exposure Concept (ANEC), Australian Noise Exposure Forecast (ANEF) if available, the Number Above ‘N’ measure, and the maximum noise level (L_{Amax}) single event noise measure.</p> <p>Identify whether land uses that are noise sensitive could be affected, directly and indirectly, by the proposal including identification and analysis of impacts to:</p> <ul style="list-style-type: none"> changes to land use and affordability. <p>Discuss recent and proposed changes in planning, such as the aerotropolis precinct, and how these changes will alter the likely impacts to people and communities. Where land use is likely to intensify, assess any foreseeable impacts to new residents and visitors to the region.</p>	<p>Chapter 4 provides an assessment of potential impacts including proposed land use changes related to strategic policy in the study area.</p>
10 – Other approvals and conditions	<p>(c) The EIS must include information on how the action relates to any other actions (of which the proponent should be reasonably aware) including:</p> <ul style="list-style-type: none"> the proposal’s interaction with local and regional planning aims and strategic implications for population growth and urban expansion; and identifying any potential land use conflicts (such as those that may result from the impact of aircraft noise and any change to the Obstacle Limitation Surface). 	<p>Chapter 2 outlines the legislative context of the project.</p> <p>Chapter 3 discusses existing and future land use within the study area.</p>

1.4 Study area

Potential impacts to existing and future land uses associated with airspace operations extend well beyond the WSI boundary. The study area for the project comprises the land surrounding WSI where aircraft movements would have an impact on land uses. The potential for land use impact broadly relates to 3 aspects, being:

- impacts on land use as a result of aircraft noise, potentially impacting the range of land uses that can be undertaken in future (specifically residential and other noise-sensitive land uses). The extent of land affected by noise is considered for the purposes of this assessment to be land within the ANEC 20 contour – a boundary beyond WSI within which noise levels would place a material impact on land use
- impacts on land use as a result of development controls that restrict development for aviation safety purposes related to wildlife-attracting land uses. Land use around WSI is being carefully planned through the implementation of wildlife buffer zones
- impacts on land use as a result of development controls that restrict development for aviation safety purposes, such as limits on building heights and restrictions on activities that increase the risk of bird strike. These airspace protection controls are established for the project by the obstacle limitation surface (OLS).

While each type of impact are relevant, the OLS represents the larger boundary of the 3, with the relevant ANEC contours and wildlife buffers generally contained within it and as such the OLS has been applied as the basis of the study area.

The OLS for WSI was prescribed on 19 October 2017 in accordance with the Airports (Protection of Airspace) Regulations 1996 (APAR). The OLS prescribed for WSI is for the long-term development of the WSI, and the OLS is reflected in the Western Parkland City SEPP and the study area.

The study area for the land use assessment is shown on Figure 1.8 and further discussion regarding OLS and ANEC is provided in Section 1.5 and Section 1.6.

1.5 Obstacle limitation surface (OLS)

The obstacle limitation surface is a series of surfaces (height controls) that define the limits to which structures or objects may project into the airspace to ensure the safety of aircraft. The purpose of the OLS is to ensure that development within the OLS area is examined for its impact on future aircraft operations and that it is properly taken into account.

WSI's protected airspace was prescribed by declaration on 19 October 2017 under the provisions of the Airports Act and Airports (Protection of Airspace) Regulation 1996. The declaration of the OLS balances the need to ensure a safe operating environment for aircraft with the community's need for clarity about development surrounding the airport. Declaration of the OLS enabled local councils and land use planning authorities to incorporate the protected airspace as appropriate in their land use planning instruments.

The OLS needs to be revised to reflect operation of the single runway (runway 05-23) and DITRDCA is currently in the process of getting the revised OLS prescribed, identifying intrusions and determining appropriate action.

While the prescribed (2017) OLS has been used as the basis of this assessment, discussion is provided in Chapter 4 regarding the potential impacts of a revised OLS.

The relevance of the OLS to land use planning is discussed in Section 2.2. The OLS for WSI is shown on Figure 1.8.

1.6 Australian Noise Exposure Forecast

For land use planning around airports, Australia has adopted the Australian Noise Exposure Forecast (ANEF) system, which describes the cumulative aircraft noise for an 'annual average day' using actual noise data from planes utilising the flight paths. The ANEF is widely accepted as a tool for informing land use planning, including noise sensitive land uses near airports.

WSI is not yet operational, and no actual flight noise data is available, therefore the Australian Noise Exposure Concept (ANEC) is used. An ANEC for WSI has been generated based on the runway direction and proposed flight paths (the project) for take-offs and landings and is a cumulative noise measure which illustrates aircraft noise exposure based on various operational scenarios.

As the ANEF is only in place once WSI is operational, this technical paper has adopted the ANEC contours as the key metric to develop a study area to assess potential impacts of overflight operations. The ANEC contours are not flight paths and properties outside of the ANEC contours may still experience aircraft noise. The ANEC contours presented in this EIS provide comprehensive information about predicted noise exposure from the project. Any change to current land use planning instruments would necessarily be based on longer-term forecasts of noise exposure and an ANEF developed for the long-term WSI development strategy.

Three different ANEC scenarios for the design year have been considered. The noise modelling process calculates the values for the noise metrics for the selected scenarios. While this process is complex, the various factors driving noise exposure are defined in Technical paper 1: Aircraft noise. The largest boundary area of the 3 scenarios has been chosen to inform this assessment's study area. The ANEC for the project is shown on Figure 1.8.

The ANECs presented in this EIS are a forecast of future aircraft noise exposure for a range of planning concepts and show the concentration of noise around WSI for single runway operations only and this is different to the ANEC represented in the Western Parkland City SEPP and used as the basis of this assessment. It is important to note that the ANEC figures for the Stage 1 Development of WSI are not intended to guide future land use planning and are provided primarily for comparative purposes and to provide comprehensive information about predicted noise exposure. Any change to current land use planning instruments would necessarily be based on longer-term forecasts of noise exposure and an ANEF developed for the long-term WSI development strategy including a parallel runway system. The WSI ANEC is based on the:

- expected aircraft movement numbers for a specific planning horizon year
- types of aircraft
- daily distribution by time period of arrivals and departures
- configuration of the runways
- arrival and departure tracks flown, along with climb and descent profiles.

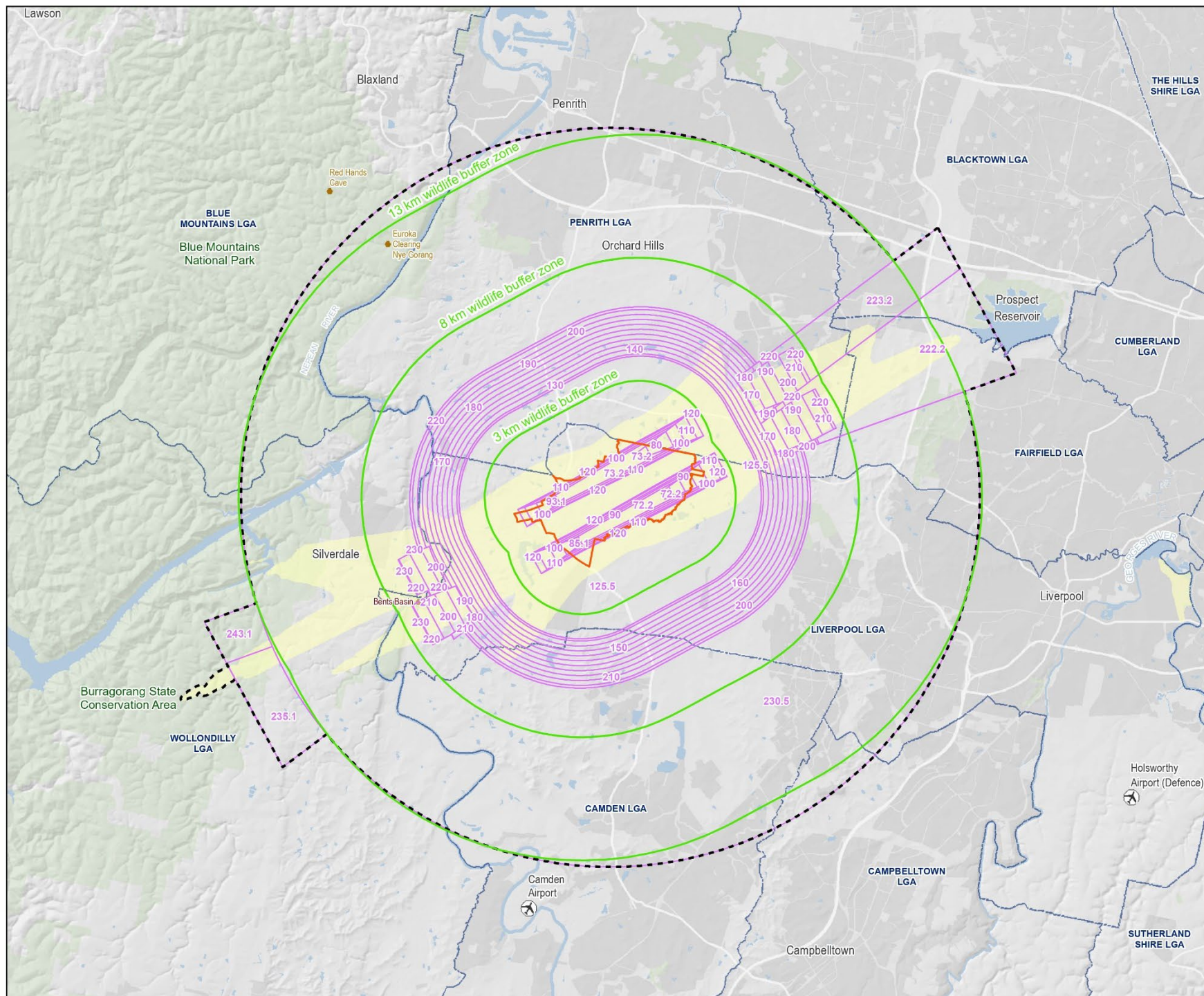


Figure 1.8

Study area

Legend

- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Land use study area
- Local Government Area
- Wildlife buffer zones
- State Environmental Planning Policy (Precincts - Western Parkland City) 2021 Obstacle Limitation Surface
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance
- State Environmental Planning Policy (Precincts - Western Parkland City) 2021 Noise Exposure Concept (units)
- ANEC 20 and above



0 1 2 3 4 5 km



Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A3

1:150,000

Date: 16/07/2024

Data sources: - DITROD, DCS, Geoscience Australia
 Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
 Airbus, USGS, NASA, NOAA, NCEAS, NLS, OS, NIMA, Geonames, GSA, GSI and the GIS User
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1.7 Dependencies and interactions with other studies

This technical paper has interactions with other studies supporting the EIS as outlined in Table 1.2.

Table 1.2 Dependencies and interactions with other technical papers

Technical paper	Relevance
Technical paper 1: Aircraft noise	Technical paper 1 considers potential significant noise and vibration impacts from aircraft overflights within a 83-kilometre (km) (approximately 45 nautical miles (nm)) radius from WSI. Noise contours from this assessment were used to inform the study area and to assist the assessment of noise and vibration impacts on land use (associated with noise sensitive receivers).
Technical paper 10: Social and Technical paper 11: Economic	Findings from this land use assessment have informed Technical paper 10 and Technical paper 11 and informed how potential negative impacts can be minimised through land use planning. Technical paper 10 also provides an overview of the consultation undertaken for the EIS including the outcomes of consultation, which have been considered in this technical paper.
Technical paper 5: Wildlife strike risk	Technical paper 5 identifies land use activities in the vicinity of the of the airport that support wildlife species or populations that may contribute to the strike risk. This technical paper also recommends strategies to mitigate the wildlife strike risk and manage hazards and consider how these strategies could impact flora and fauna. The wildlife strike assessment was reviewed for consistency with the land use assessment presented in this paper.

Chapter 2 Planning framework

This chapter provides a summary of the strategic planning framework (Commonwealth, State and Local Government) which guides land use and development within the study area as well as key industry policy related to protecting airspace and regulating land use near airports.

2.1 Legislative context

The Australian airspace is governed by Commonwealth legislation, specifically the *Airspace Act 2007* (Cth) (the Airspace Act) the *Civil Aviation Act 1988* (Cth) (the Civil Aviation Act), and its regulations, whereas the on-ground development of certain airports (such as WSI) and protection of the airspace is primarily governed by *the Airports Act 1996* (and its regulations).

In the case of WSI, the Airport Plan was approved in 2016 by the then Minister for Urban Infrastructure under the Airports Act. The Airport Plan authorised the construction and operation of the Stage 1 Development, being single runway operations. It also set the requirements for the further development and assessment of the preliminary airspace design for WSI (being Condition 16 of the Airport Plan), which must be satisfied before regular operations can commence at WSI. In seeking the Minister for Environment and Energy's advice, a Draft EIS was prepared under the EPBC Act and publicly exhibited in 2015.

The 2016 approval provided for the on-ground development of Stage 1 Development of WSI (a single runway and terminal facility capable of initially handling up to 10 million passengers per year) utilising indicative 'proof of concept' flight paths. These flight paths, presented in the 2016 EIS demonstrated that WSI could operate safely and efficiently in the Sydney Basin.

In accordance with Condition 16 and Section 160 of the EPBC Act, the proposed airspace and flight path design for the WSI (the project) has been referred to the Minister for the Environment and Water (Australian Environment Minister) for advice. In doing so, the delegate for the Minister for Environment and Water has determined that DITRDCA is the nominated proponent and that an EIS would be required that addresses the EIS Guidelines issued for the project. The EIS has been prepared to address these requirements.

NSW planning laws do not apply in relation to the management of controlled airspace. They also do not apply to the assessment of a plan for aviation airspace management by virtue of Section 160(5) of the EPBC Act.

While the EIS Guidelines provide the primary guidance for what the EIS must address, consideration has also been given to relevant NSW legislation including environmental planning instruments where considered appropriate (such as land use beyond the WSI boundary). The DITRDCA will continue to coordinate with the NSW Government and local councils to ensure integrated planning occurs.

A summary of the planning framework which guides land use planning in the project is provided in Table 2.1.

Table 2.1 Land use and planning framework for the project

Planning framework	Relevance to land use assessment
Commonwealth	
<i>Environment Protection and Biodiversity Conservation Act (EPBC Act) 1999</i>	<p>The EPBC Act provides the national framework for protecting and managing flora and fauna, ecological communities and heritage places defined as ‘matters of national significance’. Stage 1 of the WSI was approved in 2016 by the then Minister for the Environment under the EPBC Act.</p> <p>In accordance with Condition 16 and Section 160 of the EPBC Act, the project has been referred to the Minister for the Environment and Water (Australian Environment Minister) for advice.</p>
<i>Airports Act 1996 (Cth) (Airports Act)</i>	<p>The Airports Act establishes the regulatory arrangements that apply to certain federally-leased airports, including the requirements for land use planning, building approvals and environmental management.</p> <p>An approval under the Airports Act does not apply to the project, as it does not involve any physical works. However, Condition 16 of the Airport Plan does set out requirements for the airspace design process that must be addressed before regular aircraft operations can be permitted to commence at WSI.</p> <p>The DITRDCA is leading the design of the WSI airspace arrangements for single runway operations at WSI that will address Condition 16 of the Airport Plan in close collaboration with Airservices and CASA.</p>
<i>Airports (Protection of Airspace) Regulation 1996</i>	<p>The Regulations is to establish a system for the protection of airspace at, and around, airports in the interests of the safety, efficiency or regularity of existing or future air transport operations into or out of airports.</p> <p>WSI’s protected airspace was prescribed by declaration on 19 October 2017 under the provisions of the Airports Act and Regulations (APAR).</p>
<i>Airports Amendment Bill 2015</i>	<p>All development on Federally Leased Airports must be undertaken with Airport Lessee Company (ALC) consent. Due to the Western Sydney Airport not having an ALC at the time of approval, an amendment to the Airports Act was undertaken in 2015. This amendment enables the Infrastructure Minister to determine an Airport Plan for Western Sydney Airport.</p>
<i>Airport Plan 2016</i>	<p>The Western Sydney Airport – Airport Plan (Airport Plan) outlines the approach to the design and development of Western Sydney International (Nancy-Bird Walton) Airport (WSI).</p> <p>Condition 16 of the Airport Plan sets out what requirements must be addressed or followed before the WSI airspace and flight paths can be approved.</p>
<i>Airports Amendment Bill 2018</i>	<p>The amendments streamline certain administrative arrangements relating to master plans (MPs) and major development plans (MDPs) to offer a more flexible, proportionate, efficiency-based regulatory approach.</p>
<i>Noise Insulation and Property Acquisition Policy</i>	<p>DITRDCA has finalised a noise insulation and property acquisition policy which will apply to eligible properties that are significantly impacted by aircraft overflight noise from WSI..</p>
<i>Airspace Act 2007 (Cth)</i>	<p>The object of the Airspace Act is to ensure that Australian-administered airspace is administered and used safely, taking into account the protection of the environment, efficient use of that airspace, equitable access to the airspace for all users of that airspace, and national security.</p> <p>In accordance with the Airport Plan, CASA and Airservices Australia have been involved in the development of the preliminary airspace design, as presented in the EIS. Following the exhibition of the Draft EIS and the finalisation of the EIS, Airservices Australia will be responsible for the detailed design and implementation of the airspace.</p>

Planning framework	Relevance to land use assessment
<i>Civil Aviation Act 1988 (Cth)</i>	<p>The Civil Aviation Act is the primary legislation relating to aviation safety in Australia and is overseen by the CASA. Requirements relating to the safety of all aspects of civil aviation are set out in the Civil Aviation Regulations 1988 and the Civil Aviation Safety Regulations 1998. The Regulations implement the standards and recommended practices of the International Civil Aviation Organization (ICAO), which govern international civil aviation world-wide.</p> <p>As detailed throughout the EIS, the project has been designed in accordance with the relevant provisions and safety standards.</p>
<i>Air Services Act 1995 (Cth) (Air Services Act)</i>	<p>The Air Services Act establishes and governs Airservices, which is wholly owned by the Australian Government and is accountable to the Minister for Infrastructure, Transport, Regional Development and Local Government. Under the Act, Airservices Australia is to provide the facilities and services for the safety, regularity and efficiency of air navigation within Australian-administrated airspace.</p>
State (NSW) and Regional	
<i>Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act)</i>	<p>The EP&A Act (and its regulation) establishes a framework for the assessment and approval of developments in NSW. They also provide the legislative basis for environmental planning instruments, including state environmental planning policies (SEPPs) and local environmental plans (LEPs), which include land use controls. The EP&A Act establishes the basis for the current land use planning framework in the study area beyond the boundary of WSI.</p>
State Environmental Planning Policy (Transport and Infrastructure) 2021	<p>The SEPP (Transport and Infrastructure) 2021 seeks to (amongst other things) facilitate the effective delivery of infrastructure throughout NSW.</p> <p>Relevant to land use and development proximate to the WSI, and where triggered, specific infrastructure requirements under the EP&A Act must be complied with. As a Commonwealth project, the provisions of this SEPP do not apply to the WSI airspace architecture.</p>
Section 9.1 Direction 3.5	<p>Development Near Regulation Airports and Defence Airfields applies when a relevant planning authority prepares a planning proposal that will create, alter or remove a zone or provision relating to land near a regulated airport, including a defence airfield. The objectives of this direction are to:</p> <ul style="list-style-type: none"> • ensure the effective and safe operation of regulated airports and defence airfields • ensure that their operation is not compromised by development that constitutes an obstruction, hazard or potential hazard to aircraft flying in the vicinity • ensure development, if situated in noise sensitive land, incorporates appropriate mitigation measures so that the development is not adversely affected by aircraft noise.
A Metropolis of Three Cities – the Greater Sydney Region Plan, 2018	<p>NSW Government’s Greater Sydney Region Plan – A Metropolis of Three Cities (Region Plan) proposes a vision of 3 cities where most residents have convenient and easy access to jobs, education and health facilities and services. The project is located in the Western City District.</p> <p>The Region Plan integrates land use, transport and infrastructure planning between the 3 tiers of government and across State agencies and was prepared in accordance with section 3.3 of the EP&A Act which requires it to include or identify the basis for strategic planning in the region, having regard to economic, social and environmental matters.</p> <p>Objective 20 of the Regional plan states that WSI and Aerotropolis are WSI and the Aerotropolis are economic catalysts for the Western City District.</p>

Planning framework	Relevance to land use assessment
Western City District Plan 2018	The project is located within the Western District. The District Plan is a guide for implementing the Region Plan and is a bridge between regional and local planning. The District Plan informs local strategic planning statements and local environmental plans, the assessment of planning proposals as well as community strategic plans and policies). The District Plan also outlines a number of planning priorities specific to future land use planning relevant to WSI.
Western Sydney Aerotropolis Planning Framework	The Western Sydney Aerotropolis is a 11,200-ha area surrounding WSI, located within the Western City District and is made up of a number of precincts. Planning for and around the Aerotropolis includes a hierarchy of plans that will guide development in the Aerotropolis as described below.
State Environmental Planning Policy (Precincts – Western Parkland City) 2021	The State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (Western Parkland City SEPP) applies to the area surrounding WSI. Part 4.3 of the Western Parkland City SEPP relates to aviation safeguarding provisions and, in some instances, relates to land outside the Aerotropolis boundary. The Western Parkland City SEPP is an environmental planning instrument which aims to facilitate and promote the sustainable, orderly and transformational development of the Aerotropolis whilst ensuring development is compatible with the long-term growth and development of WSI, including in relation to the operation of WSI 24-hours a day. NOTE: State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 has been superseded by the State Environmental Planning Policy (Precincts – Western Parkland City) 2021 as part of the NSW Department of Planning and Environment's initiative to consolidate State Environmental Planning Policies.
Western Sydney Aerotropolis Precinct Plan	The Precinct Plan provides the place-based objectives and requirements to guide development in the Aerotropolis in a consistent and sustainable manner over time. The Precinct Plan sets out the detail to support the land use zoning and other provisions of the Western Parkland City SEPP. Precinct Plans provide strategic vision and place-based objectives, performance criteria, precinct scale structure planning in alignment with the SEPP.
Master Plans	An optional plan approved by the Minister under the SEPP. The main roles of a master plan are to: <ul style="list-style-type: none"> establish alternate development guidance for sites that are important due to size or impact on other areas be generally consistent with the vision and principles of the Aerotropolis planning framework create a complying development pathway for nominated development in large scale precincts where upfront strategic assessment can suitably manage identified risks.
Local Government	
Local environment Plans (LEPs)	A Local Environment Plan (LEP) provides local environmental planning controls and standards for land within an LGA in accordance with the relevant standard environmental planning instrument under section 33A of the EP&A Act. They are prepared and administered by local councils. The study area defined within this technical paper sits within the LGAs listed in this table. <ul style="list-style-type: none"> Liverpool Local Environmental Plan 2008 Penrith Local Environmental Plan 2010 Wollondilly Local Environmental Plan 2011 Fairfield Local Environmental Plan 2013 Blacktown Local Environmental Plan 2013 Camden Local Environmental Plan 2010 Blue Mountains Local Environmental Plan 2015.

Planning framework	Relevance to land use assessment
Local Strategic Planning Statements (LSPS)	<p>Local Strategic Planning Statements (LSPS) set out the 20-year vision for land-use in the local area, the special character and values that are to be preserved and how change will be managed into the future. Councils within the study area have provided comment in their respective LSPS regarding their position on WSI:</p> <ul style="list-style-type: none"> • Liverpool Council's LSPS (2020) identifies a comparative advantage to a curfew-free airport and supports the delivery of this new facility particularly due to associated economic and employment opportunities. It also recognises existing residential uses that may limit the success and opportunities of the WSI. • Penrith Council's LSPS (2020) identifies economic opportunities to be unlocked by the future airport. It further describes how planning should minimise public health impacts that can result from co-locating sensitive developments with activities that generate high noise emissions. • Wollondilly Council's LSPS (2020), specifically commits to 'advocate to minimise any negative impacts on the Wollondilly community from the new airport', with one possible measure proposing to limit residential growth in areas such as Silverdale and Warragamba. • Fairfield Council's LSPS (2020) identifies benefits associated with WSI as well as potential impacts on the amenity and liveability of the City which will require various responses including collaborating, advocating and opposing. Council recognises the potential noise and air pollution impacts associated with aircrafts. • Blacktown Council's LSPS (2020) states that future planning will be influenced by continued investment in transport infrastructure, including WSI. • Camden Council's LSPS (2020) identifies the opportunities for the agriculture and tourism sectors associated with WSI, as well as improved connections within the region and globally. Noise and air pollution are recognised as potential consequences of development that should be mitigated. • The Blue Mountains City Council's LSPS (2020) does not identify specific land use and planning issues related to WSI, however Council maintains its concern over the potential impacts from WSI on the World Heritage environment of the Greater Blue Mountains, on the amenity of Blue Mountains residents and the resulting potential adverse effects on the local economy.

2.2 Other relevant policy

2.2.1 Protected airspace

The airspace at and around airports is protected under Part 12 of the Airports Act and the Airports (Protection of Airspace) Regulations 1996 (APAR). International standards have been adopted which define 2 sets of invisible surfaces above the ground around an airport. The airspace above these surfaces forms the airport's protected airspace. These 2 surfaces are the:

- Obstacle Limitation Surface (OLS)
- Procedures for Air Navigational Services—Aircraft Operations (PANS-OPS) surface.

The OLS is intended to provide protection for aircraft flying into or out of the airport when the pilot is flying by sight. The PANS-OPS surfaces are intended to safeguard an aircraft from collision with obstacles when the aircraft's flight may be guided solely by instruments, in conditions of reduced visibility.

2.2.1.1 Obstacle Limitation Surface (OLS)

Structures and other activities that intrude into protected airspace have the potential to impact safe aviation operations at airports. As such, land use controls associated with OLS ensure that developments around airports do not impede on airspace and that planning authorities consider airspace requirements when determining applications surrounding WSI.

WSI's protected airspace was prescribed by declaration on 19 October 2017 under the provisions of the Airports Act and Airports (Protection of Airspace) Regulation 1996. Declaration of the OLS enabled local councils and land use planning authorities to incorporate the protected airspace as appropriate in their land use planning instruments. Regardless, intrusions into prescribed airspace that do not have prior approval under the APAR or present an unacceptable impact on airport operations are not permitted.

As part of the assessment of a development application for development that intrudes into WSI prescribed airspace requires the consent authority to consult with WSA. In addition, separate approvals under the APAR are required for activities that intrude into airspaces that is prescribed for WSI. Those activities, referred to as 'controlled activities' are listed in section 182 of the Airports Act and include:

- permanent structures, such as buildings, antennas plumes etc intruding into prescribed airspace
- temporary structures such as cranes intruding into prescribed airspace (information for crane operators)
- any activities causing intrusions into prescribed airspace through glare from artificial light or reflected sunlight, air turbulence from stacks or vents, smoke, dust, steam or other gases or particulate matter.

Some proposed permanent and temporary structures around WSI may be temporarily exempt until 2026 (prior to WSI becoming operational). These are:

- buildings, structures or things that penetrate the OLS but are no taller than 10m above ground level
- temporary penetrations less than 12 months in duration
- activities authorised the Airport Plan.

The obstacle limitation surface map for the WSI is shown on Figure 1.8.

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

The PANS-OPS surface is generally above the OLS and is designed to safeguard an aircraft from collision with obstacles when the aircraft's flight may be guided solely by instruments, in conditions of poor visibility.

Under the Airports Act and the APAR airport operators must refer short-term PANS-OPS infringements less than 3 months' to DITRDCA for approval. Long term intrusions of the PANS-OPS surface are prohibited.

A PANS-OPS for WSI will be prepared once flight paths have been designed and finalised.

2.2.2 Maximum building heights

Building height controls within the study area (and generally) are outlined in the relevant LEPs unless otherwise specified within an overriding SEPP.

Principle development standards within LEPs generally seek to establish maximum height limits for building based on broad principles such as maximising urban form, minimise shadowing, protecting views and supporting the existing and desired future character of the locality.

LEPs also provide 'height of building' maps which outline heights that are not to be exceeded for varying land use zones.

The Western Parkland City SEPP contains provisions related to building height for specific growth precincts outlined within the SEPP including areas (Aerotropolis Precinct and Oran Park and Turner Road Precinct) within the study area.

Notwithstanding the above maximum building height controls, all buildings and structures, including equipment used during construction (such as cranes) are required to be contained within OLS limits established under the Western Parkland City SEPP.

2.2.3 Existing use rights

Section 4.65 of the NSW EP&A Act includes 'existing use rights' protections in which landowners are allowed to continue the use of their land if that use was lawfully commenced at the time of the rezoning under the SEPP or the use has not been abandoned. It is possible to enlarge, expand or intensify, alter, or extend an existing use but only with the approval of the relevant consent authority.

2.3 Aircraft noise guidelines

Land-use planning is an effective means to ensure that the activities nearby airports are compatible with aviation activities. Its main goal is to minimize the population affected by aircraft noise by introducing land-use planning measures, such as land use zoning around airports.

Within the study area, expanding residential and other noise sensitive development of land surrounding WSI has the potential to create increased conflicts between airport operations and the community.

There are a several key International and Australian publications which provide strategic guidance on land use management in the proximity to aviation activities.

2.3.1 International Civil Aviation Organization – Guidance on the Balanced Approach to Aircraft Noise Management

The International Civil Aviation Organisation (ICAO) is a specialised agency of the United Nations that coordinates the principles and techniques of international air navigation, and fosters the planning and development of international air transport to ensure safe and orderly growth.

International Civil Aviation Organisation *Doc 9829 Guidance on the Balanced Approach to Aircraft Noise Management* (ICAO 2010) provides guidance on alleviating the problem of noise in the vicinity of airports. The Balanced Approach consists of identifying the noise problem at an airport and then analysing the various measures available to reduce noise through the exploration of 4 elements - reduction at source, land use planning and management, noise abatement operational procedures and operating restrictions (ICAO 2010). The guidance outlines that there are substantial benefits to be gained from the correct application of land-use planning techniques in the development of airports.

The guidelines outline preventative measures that should be considered (where possible) including:

- locate new airports at an appropriate place, such as away from noise-sensitive areas
- take the appropriate measures so that land-use planning is taken fully into account at the initial stage of any new airport or of development at an existing airport
- define zones around airports associated with different noise levels considering population levels and growth as well as forecasts of traffic growth and establish criteria for the appropriate use of such land, taking account of ICAO guidance
- enact legislation, establish guidance or other appropriate means to achieve compliance with those criteria for land use
- ensure that reader-friendly information on aircraft operations and their environmental effects is available to communities near airports.

The guidelines also state that airport authorities should work closely with local planning authorities responsible for land use management to educate them regarding the noise impact of aviation operations and encourage these authorities to develop and implement land use planning control measures in affected areas (ICAO 2010).

Further consideration of the balanced approach to aircraft noise management including potential noise and vibration impacts from aircraft overflights within a 83-km (approximately 45 nm) radius from WSI is provided in Technical paper 1.

2.3.2 National Airports Safeguarding Framework

The National Airports Safeguarding Framework (NASF) provides guidance on planning requirements for developments that could potentially affect aviation operations. The framework aims to improve community amenity by minimising aircraft noise-sensitive developments near airports; and improve safety outcomes by ensuring aviation safety requirements are recognised in land use planning decisions through guidelines being adopted by jurisdictions on various safety-related issues. This includes building activity around airports that might penetrate operational airspace and/or affect navigational procedures for aircraft. The NASF is a national land use planning framework that aims to:

- improve community amenity by minimising aircraft noise-sensitive developments near airports
- improve safety outcomes by ensuring aviation safety requirements are recognised in land use planning decisions through guidelines being adopted by jurisdictions on various safety-related issues.

The NASF establishes land use planning controls to protect aviation operations that extend beyond the Aerotropolis boundary. The NASF Guidelines are used by relevant planning authorities to help inform land use planning decisions and by proponents to prepare applications on land impacted by aviation safeguarding controls.

The NASF currently comprises 9 guidelines:

- Guideline A: Measures for Managing Impacts of Aircraft Noise
- Guideline B: Managing Risks of Building Windshear and Turbulence at Airports
- Guideline C: Managing Risks of Wildlife Strike in the Vicinity of Airports
- Guideline D: Managing Risks Associated with Wind Turbines
- Guideline E: Managing Risks of Distractive Lighting in Vicinity of Airports
- Guideline F: Managing Risks of Intrusion into Protected Airspace
- Guideline G: Protecting Aviation Facilities – Communications, Navigation and Surveillance
- Guideline H: Protecting Strategically Important Helicopter Landing Sites
- Guideline I: Managing the Risks in Public Safety Areas at the ends of Runways.

2.3.3 Aviation Safeguarding Guidelines

The Aviation Safeguarding Guidelines – Western Sydney Aerotropolis and surrounding areas (October 2021) (NSW Department of Planning and Environment 2022) provide guidelines for managing land use impacts related to aircraft noise and were developed by the former DPE (now DPHI) with input from the DITRDC. The guidelines seek to ensure planning authorities consider the aircraft noise guidelines and noise exposure contour maps when undertaking land use planning for the Aerotropolis and surrounding areas of influence.

The NSW Government supports the NASF with the exception of Guideline A (refer Section 2.3.2) and uses the existing policy of DPHI which relies on ANEF contours and AS 2021:2015. The NSW Government has endorsed the use of ANEF for land use planning, not the N-above contours (NSW DPE 2022). Until the ANEF contour is approved for WSI, the WSI ANEC contour (based on the runway direction and proposed flight paths) is to be used to inform land use planning.

Planning instruments such as Western Parkland City SEPP and LEPs contain controls to ensure that incompatible development (particularly noise sensitive development, such as schools and hospitals etc) is not approved in the vicinity of WSI, specifically within ANEC 20. As such, planning authorities may not grant consent to development unless it is demonstrated to be in accordance with Australian Standard 2021-2000 based upon ANEC contours in the Western Parkland City SEPP.

2.3.4 AS2021:2015 Acoustics – Aircraft noise intrusion – Building siting and construction

AS 2021:2015 (Standards Australia, 2015) provides guidance on the siting and construction of new buildings with regard to aircraft noise intrusion. The assessment of potential aircraft noise exposure at a given site is based on the Australian Noise Exposure Forecast (ANEF) contours. The Standard also provides guidelines for determining the type of building construction necessary to provide a given noise reduction.

All levels of Government give effect to AS 2021:2015 in land use planning for new development in environmental planning instruments, and as a necessary consideration in building siting and design as part of the assessment of new development applications within the vicinity of airports.

The AS 2021:2015 provides details on the uses which are acceptable in the different ANEF contours as described in Table 2.2.

Table 2.2 AS 2021:2015 – Acceptability based on ANEF Zones (in conjunction with Table 3.3 of AS 2021:2015)

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

Chapter 3 Existing environment

This chapter describes the existing conditions and features of the study area to provide a baseline against which the project's impacts can be assessed. This includes information on existing land use types and Commonwealth Lands as well as a summary of the existing land use planning controls relevant to the project.

3.1 Regional context

Western Sydney is one of Australia's fastest growing regions and is Australia's third-largest economy. Two million people currently live in Western Sydney with the expectation of another million people moving into the region by the 2030s.

The study area encompasses a large area of Western Sydney, traversing parts of the Liverpool, Penrith, Wollondilly, Fairfield, Blacktown, Camden and Blue Mountains LGAs. Large population centres within these LGAs, such as Penrith and Liverpool are experiencing significant population growth that is being driven by major infrastructure and land use initiatives. Western Sydney International and Aerotropolis will be the key catalyst for driving further growth and development in the region.

In addition to WSI and the Aerotropolis, the region supports a diverse and competing range of current and proposed land uses. Growth areas, urban renewal corridors, economic corridors and large infrastructure projects are planned or currently under construction.

North of WSI, land use is primarily a mix of urban residential, commercial and industrial uses with scattered areas of rural and agricultural areas. The Greater Penrith to Eastern Creek Investigation Area (GPEC) incorporates approximately 19,000 ha from the Nepean River in the west to the M7 Motorway in the east and is comprised of parts of the Blacktown and Penrith LGAs (refer Figure 3.1). The GPEC area was identified in the Greater Sydney Region Plan as an area for growth and change due to its access to infrastructure and services associated with WSI.

Adjacent to GPEC is the Western Sydney Employment Area (WSEA). The WSEA was established to supply employment land close to major road transport and the Aerotropolis and to provide jobs for Western Sydney.

The Defence Establishment Orchard Hills site (located about 5 km to the north of WSI) is primarily used for defence purposes however plays an important conservation role with much of the vegetation on the site protected as an offset to the impacts of WSI. Commercial and industrial hubs are located at Erskine Park, Eastern Creek, St Marys and Wetherill Park.

To the west of WSI, rural land uses such as primary production and agriculture along with large rural residential properties are the primary land use.

The South West Growth Area (SWGA) lies directly to the south of WSI. This area comprises approximately 10,000 ha adjoining the Western Sydney Aerotropolis and aims to connect new suburbs with WSI and the broader WSEA to the north.

East of WSI, land uses progressively change from a mix of rural residential and agriculture (near WSI) to higher density residential, manufacturing and industrial land uses (within the Liverpool LGA) near Hoxton Park, Prestons and Liverpool. The large Western Sydney Parklands provides a green, recreational corridor stretching from the M7 Motorway in the north to Bringelly Road in the south.

A summary of key planning strategies and corridors in the Western Sydney region are shown on Figure 3.1.

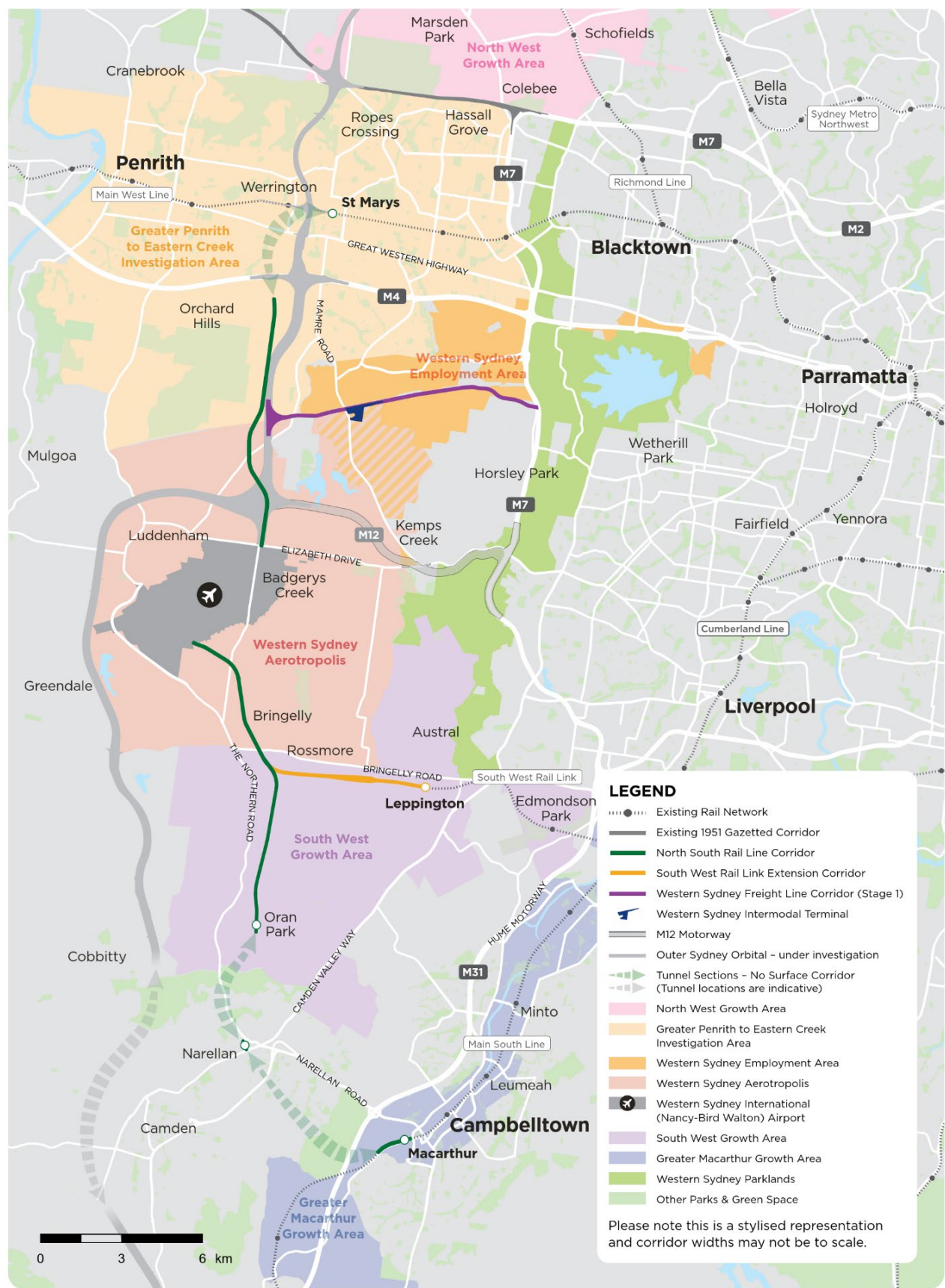


Figure 3.1 Regional context and strategic planning (source Transport for NSW 2020)

3.2 Existing land uses

The following sections give an overview of the key land uses within the study area. Social infrastructure in the vicinity of the project is discussed in more detail in Technical paper 10 and Technical paper 11.

3.2.1 Residential

The major urban and residential centres of Liverpool, Camden and Campbelltown all sit outside of the study area and land uses within those centres are not discussed in this assessment.

Penrith city centre also falls outside of the study area, however Penrith's southern suburbs of South Penrith, Jamison Town, Glenmore Park and Regentville represent some of the highest density residential areas within the study area, with residential development in a linear corridor along the Great Western Highway and the Main Western Railway. Other key residential areas within the study area, to the north of WSI include St Marys, St Clair and Erskine Park.

The residential community of Twin Creeks Golf and Country Club is located directly north of the Airport Site and includes about 200 residential dwellings.

The villages of Luddenham and Wallacia are located immediately west of WSI, generally straddling the Northern Road between Park Road and Adams Road, and Mulgoa Road, north and south of the intersection of Park and Silverdale Roads. Further to the west of WSI in the Wollondilly LGA, Silverdale and Warragamba are small villages with primarily low density and large lot residential areas.

Developing residential areas in the SWGA such as Oran Park and Leppington sit in the south of the study area in the Camden LGA and are experiencing rapid growth in conjunction with increased transport infrastructure.

Beyond the residential areas discussed above, the study area contains large rural areas that serve as locations for people to live in a rural-residential or bushland setting (Greater Sydney Commission, 2018).

3.2.2 Agricultural

Western Sydney has an important historical attachment to agricultural and horticultural land uses associations with Australia's early agricultural industries, including the wool industry, and its role in early colonial settlement. Significant agricultural land use is still present in the study area.

Agricultural uses in the study area support a broad range of activities including (but are not limited to) grazing, dairy, production of eggs and poultry, cut flowers, turf and mushroom farms to name a few. Agricultural industries also provide produce, employment and tourism opportunities to communities within the study area.

The landscape to the north-west of WSI includes the Mulgoa Valley and Wallacia Significant Rural Landscape (Penrith City Council, 2020), characterised by its predominantly rural landscape and undulating agricultural land. Luddenham village is surrounded by agricultural production areas.

The southern part of the study area, between WSI and Bringelly Road includes large lot rural residential and small lot agricultural uses.

3.2.3 Recreation

There are several large and vital recreation and tourism-based land use assets within the study area. Increasing growth in Western Sydney is placing greater emphasis on the importance of existing recreational and open space areas and facilities.

A small part of the Greater Blue Mountains Area (GBMA) World Heritage property sits within the study area. The GBMA was inscribed on the UNESCO World Heritage List in 2000 and its biodiversity values are complemented by numerous other values, including wilderness, recreation and natural beauty. Technical paper 14: Greater Blue Mountains World Heritage Area, has been prepared to address the requirements relating to impacts that may occur to or on the GBMA and provided further detail on the existing recreational and tourism values of the GBMA.

Western Sydney Parklands is located to the north-east and east of WSI, stretching for 27 km over 3 LGAs (Blacktown, Liverpool and Fairfield), creating a large area of recreational and open space for western Sydney. Under the *2030 Plan of Management* (Western Sydney Parklands, 2018), the Parklands will remain mostly bushland (40 per cent), with 30 per cent set aside for recreation and tourism facilities and 5 per cent designated for urban farming.

The Wianamatta – South Creek corridor, to the east of WSI provides a significant green corridor to local communities in the study area.

Approximately 5 km north of WSI is the Twin Creeks Golf and Country Club, a 340-ha estate comprising an 18-hole golf course, function centre and a restaurant. Other golf course located in the study area include Wallacia Panthers Country Club, Penrith Golf Course and Camden Lakeside Golf Course.

Bents Basin State Conservation Area (located in Greendale and Silverdale) is a popular swimming hole with a camping area and an education centre used by local school groups. The Silverdale Rifle Range is located approximately 6 km to the south-west of the Airport Site. Numerous small, local, recreation assets such as parks, playgrounds, skate parks and picnic areas are also located within the urban parts of the study area.

Key recreational land uses are shown on Figure 3.1 and Figure 3.2.

3.2.4 Industrial and commercial

The study area includes expansive industrial and commercial land uses to the north and east of WSI, supporting a range of industrial activities including advanced manufacturing, trade and freight logistics. The industrial hubs located at Erskine Park, Eastern Creek and Hoxton Park are significant contributor to the economic outcomes of Western Sydney.

There are extractive industries based on construction material resources in the study area, with major concentrations of construction sand around Londonderry and the Hawkesbury River, as well as clay and shale resources for brick and tile manufacture, particularly around Horsley Park (Greater Sydney Commission, 2018).

The Kemps Creek Resource Recovery Park is located immediately to the north of WSI.

An array of small-medium commercial enterprises are scattered throughout the study area including shopping precincts, commercial agribusiness services, hospitality services and retail.

The location of key industrial and commercial uses within the study area are shown on Figure 3.2.

3.2.5 Health and education

Key health and education precincts are located within the study area.

The Penrith health and education precinct is the major cluster of health and educational land uses in the study area and is based around Nepean Hospital, the Western Sydney University Werrington Campus and Nepean College of TAFE Allied Health Facility.

Education and health facilities such as high schools, primary schools, specialist and general practitioner surgeries are located throughout the study area, generally in proximity to residential areas. A complete list of health and education facilities is provided in the study area is provided in Appendix A. Luddenham Public School (Primary), is the nearest education land use, located adjacent to WSI within Luddenham Village. The school consists of 3 multi-aged classes accommodating the 53 students (as of 2021). Holy Family Catholic Primary School is also located in Luddenham and has 230 students (as of 2022). Both schools are located within the Western Parkland City SEPP ANEC 20 contour.

Mamre Anglican School is located just beyond the ANEC 20 to the north of WSI and is a co-educational institution with around 250 students.

Key health and education facilities in the study area are shown on Figure 3.2.

3.2.6 Transport infrastructure

WSI is the catalyst for much of Western Sydney's planned road and public transport project. Strategic planning for WSI and the Aerotropolis has been prepared concurrently with the NSW Government's *Future Transport Strategy 2056* and Infrastructure NSW's *State Infrastructure Strategy 2018–2038* to integrate land use, transport and infrastructure across the region.

Existing major transport infrastructure in the study area includes:

- the M4 Western Motorway and the Great Western Highway which run east-west in the north of the study area
- the M7 Motorway which runs north-south in the east of the study area
- the Northern Road (A9) (currently being upgraded) which runs north-south, past WSI from the M4 Western Motorway to Camden Valley Way
- Elizabeth Drive, which runs east-west from Luddenham to the M7 Motorway
- Bringelly Road, which runs east-west from The Northern Road (Bringelly) to Camden Valley Way
- Main Western Rail Line, which connects Sydney and the Blue Mountains
- South West Rail link, currently terminating at Leppington.

In addition, there are a large network of State, Regional and Local Roads connecting suburbs and communities within the study area.

Existing major transport infrastructure in the study area is shown on Figure 3.1 and Figure 3.2.

3.2.7 Commonwealth Land

The Commonwealth Government acquired approximately 1,780 ha of land at Badgerys Creek for the proposed Western Sydney Airport in the 1980s and 1990s and all land within the Airport Site boundary will be used for airport operations. The boundary of the Airport Site is shown on Figure 3.1.

Defence Establishment Orchard Hills (DEOH) is a large (about 1,740 ha) Commonwealth Government (Department of Defence) land holding located about 4 km to the north of WSI. The site provides storage, maintenance and disposal of explosive ordnance along with ordnance training to meet Service capabilities. The DEOH, while primarily used for defence purposes, plays an important conservation role with much of the vegetation on the site protected as an offset to the impacts of WSI.

The DEOH is vegetated with remnants and regenerating areas of Cumberland Plain Woodland, listed as a critically endangered ecological community at both State (Cumberland Plain Woodland in the Sydney Basin Bioregion) and Commonwealth levels. The DEOH acts as a refuge and reservoir of regional conservation significance for species that are dependent on low levels of agricultural and urban development.

The Heritage Management Plan for the DEOH site (Godden Mackay Logan, 2013) outlines management guidelines related to both natural and historic heritage values.

Holsworthy Military Reserve and the Defence Royal Australian Air Force (RAAF) bases at Richmond and Glenbrook sit beyond the study area for this assessment.

3.3 Future land use

Significant strategic planning is underway within Western Sydney, with much of the study area going to experience substantial transformation and growth over the coming decades. Key planning initiatives that will drive development in the study area and how they are related to the project are outlined below.

3.3.1 Western Sydney Aerotropolis

The Western Sydney Aerotropolis is a 11,200-ha area surrounding WSI. The Aerotropolis will become a hub of industry and innovation, attracting local and global companies drawn to the Western Parkland City and WSI. Western Sydney Aerotropolis is made up of several precincts (refer Figure 3.3), including:

- Aerotropolis Core
- Bradfield Centre
- Badgerys Creek and adjoining areas of Wianamatta-South Creek
- Northern Gateway
- Agribusiness
- Luddenham Village.

The supporting *Western Sydney Aerotropolis Precinct Plan* (NSW DPE, 2020) is in force under the provisions of the Western Parkland City SEPP. The Precinct Plan provides the place-based objectives and requirements to guide future development in the Aerotropolis in a consistent and sustainable manner over time. The Precinct Plan outlines specific objectives for ensuring that development is responsive to the WSI's operational constraints including aircraft noise and OLS.

Planning for the Luddenham Village precinct is ongoing and the NSW Government released the Luddenham Village Interim Strategy in 2022 (NSW DPE, 2022). The interim strategy will inform the Luddenham Village Plan which will outline land use planning provisions and controls (including development within the ANEC 20 contour) relating to Luddenham Village and will be incorporated into the Aerotropolis Precinct Plan.

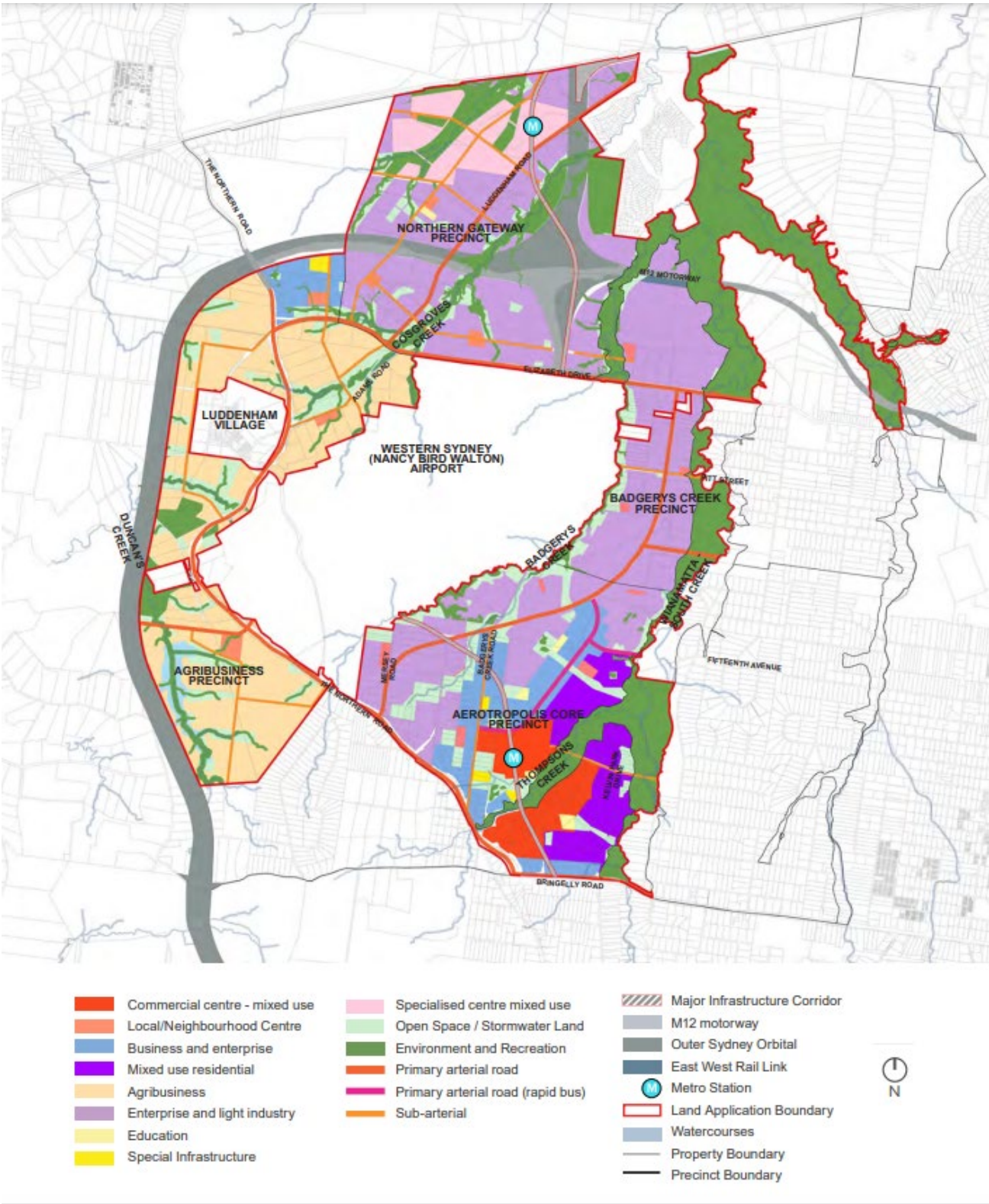


Figure 3.3 Aerotropolis land use and structure plan (Source: NSW DPE 2023)¹

¹ Additional Metro stations located within the WSI site (Airport Terminal and Airport Business Park) have been approved since the development of this figure and are not represented

3.3.2 Greater Penrith to Eastern Creek Investigation Area

Greater Penrith to Eastern Creek Investigation Area (GPEC) spans approximately 19,000 ha from the Nepean River in the west to the M7 Motorway in the east and is comprised of parts of the Blacktown and Penrith LGAs.

The GPEC will build on the opportunities created by the Western Economic Corridor and seek to enhance the integration of land use and transport planning to guide redevelopment opportunities and identify the infrastructure required to support continued growth (Greater Sydney Commission, 2018). The draft GPEC Strategic Framework (the framework) is a strategic planning document that will guide future detailed planning for the area. It consolidates and builds upon the strategic planning and infrastructure work already undertaken in the area to set a clear direction for future growth and development. The framework also supports local planning to achieve a shared vision for the GPEC area, by guiding precinct planning and planning proposals, and informing new or revised local planning controls like LEPs and DCPs.

The final strategic framework will be supported by a Ministerial direction that will require planning proposals to align with the priorities, directions and actions in the strategic framework. The strategic framework will also inform ongoing strategic planning by the councils, including local strategies and future updates to local strategic planning statements (LSPSs). The draft Strategic Framework does not rezone land in GPEC. It identifies areas that will need further detailed planning and provides a framework to guide the planning process that would lead to future rezoning in these areas.

The GPEC area is shown on Figure 3.1.

3.3.3 South West Growth Area

The SWGA lies directly to the south of WSI. This area comprises approximately 10,000 ha adjoining the Western Sydney Aerotropolis and aims to connect new suburbs with WSI and the GPEC to the north. The SWGA is comprised of 14 precincts and several sub precincts. To date, 9 precincts have been rezoned with a focus on providing new residential areas to support Western Sydney's growth. The NSW Government has recently updated the Structure Plan for the SWGA. In conjunction with the new Structure Plan, a new Ministerial Direction under section 9.1 of the EP&A Act is being prepared.

Planning Proposals must consider the strategic vision outlined in the NSW Government's *A Metropolis of Three Cities* and the Western City District Plan. Planning Proposals must also be consistent with the strategic framework, which includes the relevant Local Strategic Planning Statements (LSPS), Local Housing Strategy (LHS) and other relevant strategies. The SWGA Structure Plan is shown on Figure 3.4.

3.3.4 Infrastructure

A number of large-scale transport and infrastructure projects and initiatives are in varying stages of strategic planning (as yet not funded or committed to) or construction within the study area. Further planning and assessment of these projects will need to be integrated into land use planning within the study area and consider the requirements of WSI and the project.

Key transport infrastructure projects under consideration in the region include:

- North South Rail Link between Cudgegong Road and St Marys and Badgerys Creek Aerotropolis and Macarthur
- Western Sydney Airport – Badgerys Creek Aerotropolis to Parramatta train link
- Leppington to Western Sydney Airport –Badgerys Creek Aerotropolis train link
- Outer Sydney Orbital road and freight rail
- Sydney Metro City & Southwest extension between Bankstown and Liverpool
- M5 extension between Liverpool and the Outer Sydney Orbital.
- Upgrades to the Northern Road, Bringelly Road and the M12 Motorway.

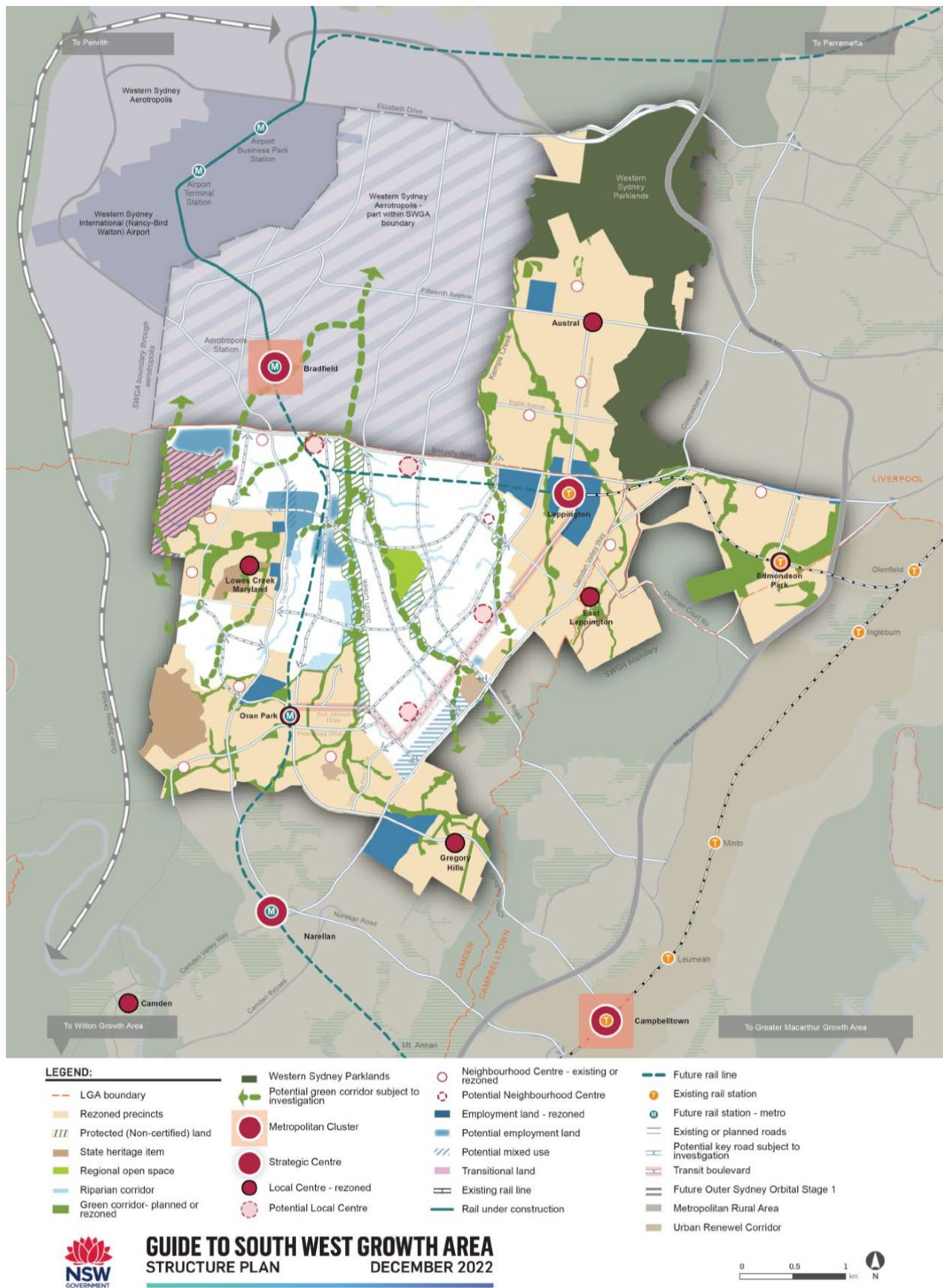


Figure 3.4 South West Growth Area Structure Plan (Source: NSW Planning 2022)

3.3.5 Land zoning

Land zoning within NSW identifies the type of land uses that are permitted (with or without consent) or prohibited in each zone on any given land as designated by the relevant NSW environmental planning instrument under the EP&A Act. Each zone will typically have a series of objectives outlined in the planning instrument, which provide for the desired outcomes of development that will occur within the zone and therefore set the future land use in the study area.

Land zones within the study area are shown on Figure 3.5.

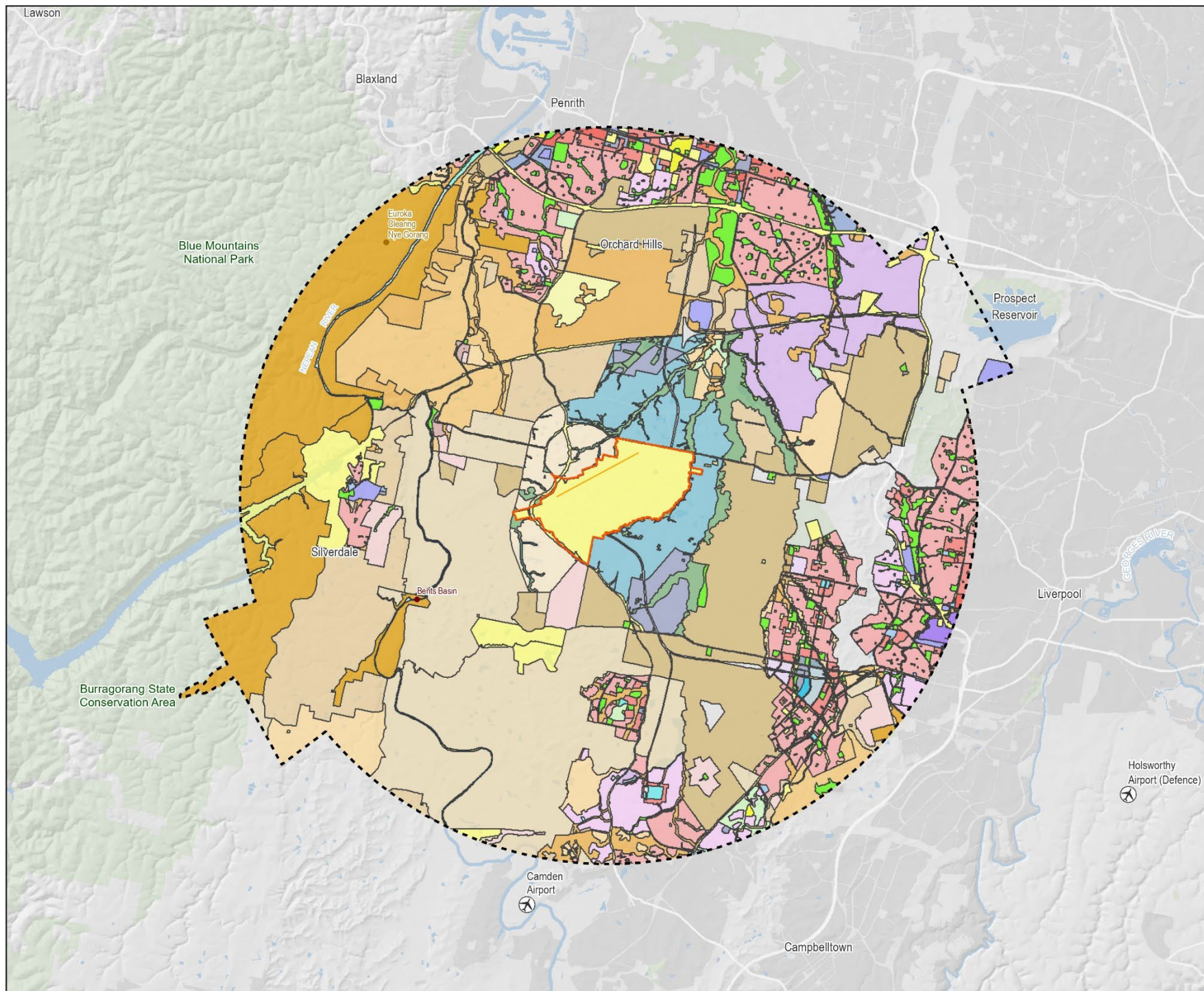


Figure 3.5
Land zoning in the study area

- Legend**
- WSI Runway
 - Western Sydney International (Nancy-Bird Walton) Airport land boundary
 - Land use study area
 - Aboriginal Places raised during consultation (NPW Act)
 - Site of Aboriginal significance
- Land zoning**
- | | |
|---------------------------------------------------------------|-------------------------------------|
| AGB - Agribusiness | EN2 - Environment and Recreation |
| B1 - Neighbourhood Centre | IN1 - General Industrial |
| B2 - Local Centre | IN2 - Light Industrial |
| B3 - Commercial Core | MU - Mixed Use |
| B4 - Mixed Use | MU1 - Mixed Use |
| B5 - Business Development | R1 - General Residential |
| B7 - Business Park | R2 - Low Density Residential |
| C1 - National Parks and Nature Reserves | R3 - Medium Density Residential |
| C2 - Environmental Conservation; C2, Environmental Management | R4 - High Density Residential |
| C3 - Environmental Management | R5 - Large Lot Residential |
| C4 - Environmental Living | RE1 - Public Recreation |
| E1 - Local Centre | RE2 - Private Recreation |
| E3 - Productivity Support | RU1 - Primary Production |
| E4 - General Industrial | RU2 - Rural Landscape |
| E5 - Heavy Industrial | RU4 - Primary Production Small Lots |
| ENT - Enterprise | RU5 - Village |
| | RU6 - Transition |
| | SP1 - Special Activities |
| | SP2 - Infrastructure |
| | SP3 - Tourist |
| | SP4 - Enterprise |
| | W1 - Natural Waterways |
| | W2 - Recreational Waterways |



0 2 4 km



Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A3

1:150,000 Date: 16/07/2024

Data sources: DITROC, DCS, Geoscience Australia
ESRI, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Airbus, USGS, NOAA, NASA, CSIRO, NCEAS, NIS, US, NOAA, Geodatenzettel, GSA, JISI and the GIS User

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Chapter 4 Impact assessment

This chapter provides a description of all the relevant impacts of the project on existing and future land use and planning.

The Commonwealth Government acquired approximately 1,780 ha of land at Badgerys Creek for the proposed Western Sydney Airport in the 1980s and 1990s. Land use planning restrictions have been in place since the 1980's with a voluntary property acquisition program undertaken in the early 1990's. Since then, significant strategic land use planning has been undertaken surrounding WSI with the aim of delivering compatible and supporting land uses for the Airport Site. WSI in turn is expected to drive population growth, infrastructure investment and job creation in the surrounding region.

The NSW planning system governs land use planning and development controls for land outside of the WSI boundary. NSW planning laws do not, however, apply in relation to the management of prescribed airspace and therefore the project. They also do not apply to the assessment of a plan for aviation airspace management by virtue of Section 160(5) of the EPBC Act.

While the EIS Guidelines provide the primary guidance for what the EIS must address, consideration has also been given to relevant NSW legislation including environmental planning instruments were considered appropriate (such as land use beyond the WSI boundary). The DITRDCA will continue to coordinate with the NSW Government and local councils to ensure integrated planning occurs.

Potential impacts to existing and future land uses associated with airspace operations extend well beyond the WSI boundary. The assessment of impacts to land use has been limited to land surrounding WSI (the study area) where aircraft movements may have an impact on land uses.

The assessment of potential impacts presented below is based on the potential for 3 key aspects of the project and how they affect key land uses in the study area:

- aircraft noise contours (ANEC), and the impact they could have on existing land use and future planning or approvals
- the potential for restricted development due to protected airspace (OLS and PANS-OPS)
- wildlife buffers and framework for how to manage the risk of wildlife strike on aircrafts in the vicinity of WSI.

The project does not include any physical infrastructure or construction work and as such, the following assessment is limited to operational impacts only.

Facilitated impacts associated with the project are assessed in Technical paper 13: Facilitated changes.

4.1 Impacts from aircraft noise contours

Aircraft noise in the vicinity of flight paths is an unavoidable consequence of aircraft operations at WSI. Areas subject to flight paths would experience varying levels of aircraft noise, depending on a range of operational and meteorological factors. Potential impacts related to aircraft noise including noise exposure forecasts associated with aircraft operations, is provided in Technical paper 1. The following sections assess the potential impacts that aircraft related noise may have on existing and future land use planning for key land uses in the study area.

4.1.1 Residential

The NSW planning framework takes a precautionary approach to residential land use development in regard to WSI operations and has adopted an approach which relies on ANEF contours and AS 2021:2015 to inform planning decisions for residential land uses in areas affected by aircraft noise. Until the ANEF contour is approved for WSI, the long-term, dual runway ANEC contour presented as the Noise Exposure Contour Map in the Western Parkland City SEPP is to be used to inform land use planning (DPE 2022).

Residential dwellings are currently located within the prescribed ANEC 20 contour and are located in:

- Luddenham Village, generally south-east of Blaxland Avenue
- the eastern fringes of Silverdale
- Twin Creeks Golf and Country Club
- scattered rural-residential properties within the suburbs of Luddenham, Badgerys Creek and Greendale.

Barracks (living in accommodation) areas at the DEOH site are located outside of the ANEC 20 contour.

As outlined in Section 2.2.3 existing land uses within the ANEC 20 contour can continue in the future due to existing use rights. The Western Parkland City SEPP clarifies the provisions for existing residential areas or land already approved for residential development. Clause 4.17 *Aircraft noise* states:

(4) development consent may be granted to development for the purposes of dwelling houses on land that is in an ANEF or ANEC contour of 20 or greater if—

(a) immediately before the commencement of this Chapter—

(i) there were no dwellings on the land, and

(ii) development for the purposes of dwelling houses was permitted on the land, and

(b) the consent authority is satisfied that the development will meet the indoor design sound levels.

(4A) Subsection (2) does not apply to development for the purposes of subdivision of land in an ANEF or ANEC contour of 20 or greater if the development application was made before 1 October 2020.

With regard to future residential development, the Western Parkland City SEPP outlines that no noise sensitive development (including residential development) will be permitted within the ANEC 20 and above contours. For example, dual occupancies, secondary dwellings and the subdivision of land for residential purposes that have not already been approved, will not be permitted.

If a development site is found to be 'conditionally acceptable' (as per Table 3.3 of AS 2021:2015) this typically means that any proposed buildings could require an improved level of building fabric above standard or light-weight materials to achieve internal noise goals set by AS 2021:2015 and development consent may be granted for those purposes if the consent authority is satisfied that the development will meet the indoor design sound levels as detailed in the AS 2021:2015 (refer acceptability based on ANEF zones in Table 2.2) and outlined in Table 4.1.

Table 4.1 Residential indoor design sound levels for determination of aircraft noise reduction (AS 2021:2015)

Building type (and activity)	Indoor design sound level (dB(A))
Houses, home units, flats, caravan parks	
• Sleeping areas, dedicated lounges	50
• Other habitable spaces	55
• Bathrooms, toilets, laundries.	60

Planning controls for the Aerotropolis and surrounding areas, have also adopted a precautionary approach to aircraft noise controls, particularly noise sensitive development within the ANEC 20.

The *Western Sydney Aerotropolis Precinct Plan* identifies that only a few centres in the Aerotropolis will be suitable for residential uses because of aircraft noise and airport operational constraints. The Aerotropolis Core precinct will include residential development in areas not significantly affected by aircraft noise (DPE, 2022). The Plan also identifies that other precincts within Aerotropolis (such as Badgerys Creek) are not suitable for noise sensitive land uses such as residential development.

As outlined in Section 1.6, the ANECs presented in the EIS are a forecast of future aircraft noise exposure for a range of planning concepts and show the concentration of noise around WSI for single runway operations only. This is different to the ANEC in the Western Parkland City SEPP and used as the basis of this assessment. The ANEC presented in the Western Parkland City SEPP represents the long-term development of the Airport Site, including parallel runways and facilities for up to 82 million passengers annually (nominally occurring in 2063).

It is important to note that the ANEC figures for the Stage 1 Development of WSI are not intended to guide future land use planning and are provided primarily for comparative purposes and to provide comprehensive information about predicted noise exposure. Any change to current land use planning instruments would necessarily be based on longer-term forecasts of noise exposure and an ANEF developed for the long-term WSI development strategy including a parallel runway system.

A comparison of forecast ANEC 20 contours for the key operating scenarios against the Western Parkland City SEPP ANEC 20 contour is shown on Figure 4.1.

The 2 project operating scenarios considered were the composite scenario for:

- 2033 - when single runway operations handle up to 10 million annual passengers and around 81,000 air traffic movements per year by 2033
- 2055 - when single runway operations approach capacity at around 37 million annual passengers and around 226,000 air traffic movements per year in 2055.

These scenarios were chosen as the composite noise contours associated with scenarios 1 (No preference), 3 (Prefer Runway 05) and 4 (Prefer Runway 23) (refer to Technical paper 1) provide a level of confidence around the likely 'worst case' annual average of the potential operating scenarios for noise exposure of communities in the vicinity of WSI.

Comparison of the 2 contours against the SEPP contour shows the following:

- The ANEC 20 contour for 2033 scenario sits wholly within the prescribed ANEC 20 contour. Based on this contour, no additional land would be subject to planning restrictions based on aircraft noise from scheduled flight operations between 2026 and 2033.
- The ANEC 20 contour for 2055 extends slightly beyond the prescribed ANEC 20 contour in several locations in the vicinity of Erskine Park, Eastern Creek and to the south of Wallacia. These areas are currently zoned 'general industrial' (Penrith LEP) and 'primary production' (Liverpool LEP) and include a small number of semi-rural residential dwellings and around 6 residential dwelling located within the Twin Creeks Golf and Country Club (refer Figure 4.1). Until an ANEF contour is approved for WSI, (it would be prepared for WSI during the detailed airspace design phase, based on modelled long-term parallel runway operations), the prescribed WSI ANEC is to be used to inform land use planning. Any changes to relevant planning instruments as a result of adopting an ANEF could see planning conditions imposed on these additional areas.

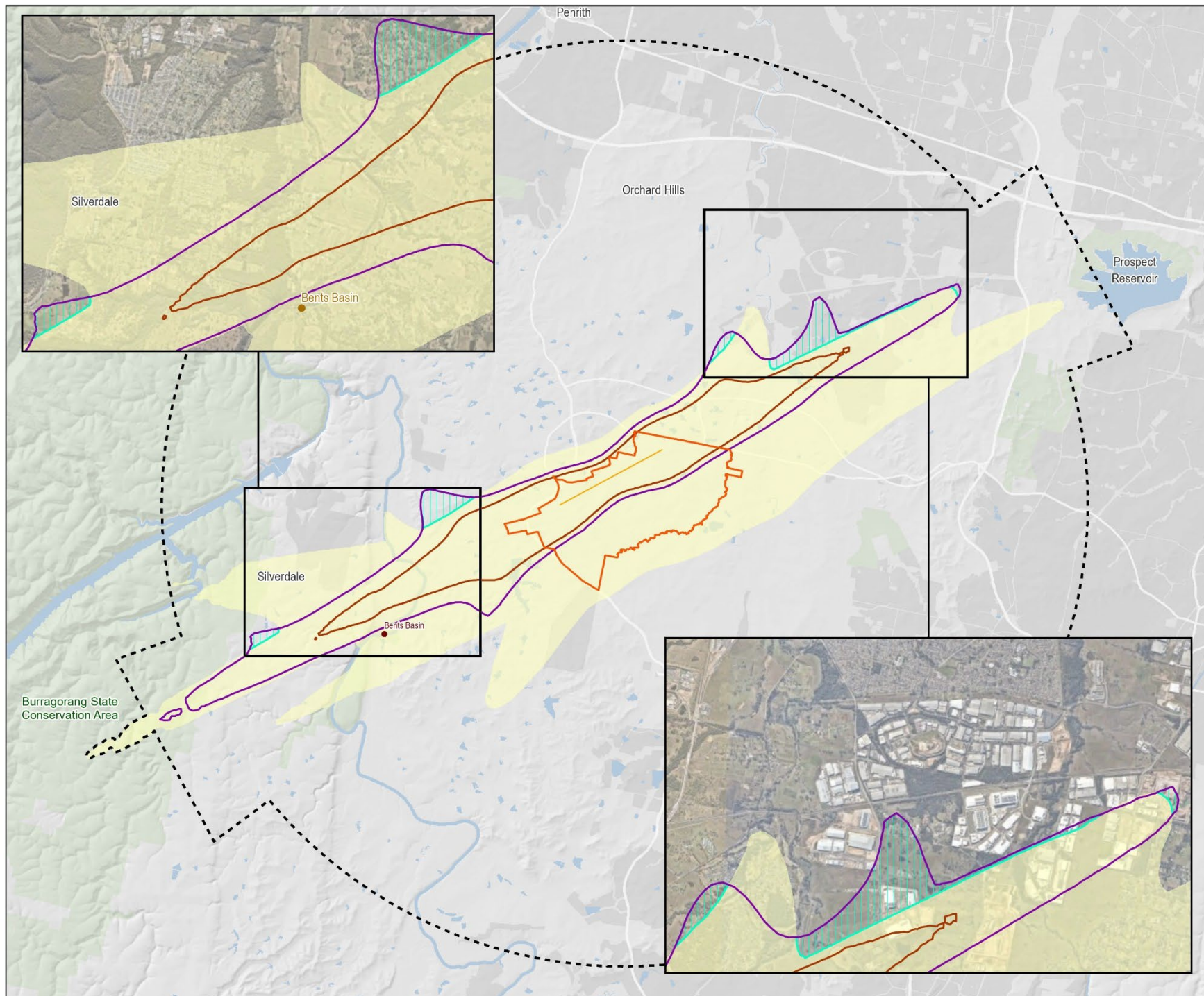


Figure 4.1

Comparison of ANEC contours

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- - - Land use study area
- ▨ Potential additional area impacted by ANEC
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal

State Environmental Planning Policy (Precincts – Western Parkland City) 2021 Noise Exposure Concept (units)

ANEC 20 and above

2033 ANEC

20

2055 ANEC

20



0 2 4 km



Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A3

1:120,000

Date: 16/07/2024

Data sources: - DITRD, DCS, Geoscience Australia
 Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
 Airbus, USGS, NASA, NOAA, NCEAS, NLS, OLS, NMA, Geodata@queensland, GSA, GSI and the GIS User
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4.1.2 Agricultural

Much of the study area currently comprises agricultural uses and is characterised by predominantly a rural landscape and undulating agricultural land.

There are no specific provisions for protecting agricultural land uses from aircraft noise in the Western Parkland City SEPP. Additionally, AS: 2021-2015 also does not have specific guidance for agriculture, however the standards do identify that light industrial use (which could include some agricultural activities) is acceptable in ANEF 30 and below. Residential dwelling on agricultural land, however, should meet the indoor design sound levels as detailed in the AS 2021:2015 and outlined in Table 4.1.

As such, aircraft noise from WSI would not have any specific planning or land use impacts on existing agricultural areas.

The *Western Sydney Aerotropolis Precinct Plan* identifies the Agribusiness Precinct to the west of WSI and surrounding Luddenham Village. The Agribusiness Precinct is proposed to increase agricultural and agribusinesses uses and will build on successful agricultural operations and develop new agribusiness opportunities while protecting and embracing important vegetation within the landscape (DPE 2022).

4.1.3 Recreation

There are several large recreation and tourism-based land use assets within the study area, including a small section of the GBMA and the Western Sydney Parklands is located to the east of WSI (refer Figure 3.1). The Wianamatta – South Creek corridor, to the east of WSI provides a significant green corridor to local communities in the study area. Additionally, there are numerous small recreational land uses such as parks and sporting fields throughout the study area.

The Twin Creeks Golf Club and Willmington Reserve in Luddenham Village are located within the Western Parkland City SEPP ANEC 20 contour northeast of the WSI.

There are no specific provisions for protecting recreational land uses from aircraft noise in the Western Parkland City SEPP. Additionally, AS: 2021-2015 does not have specific guidance for recreation land uses.

The National Airports Safeguarding Framework's (NASF), *Guideline I: Managing the Risks in Public Safety Areas at the ends of Runways* aims to limit the number of people living, working or congregating within Public Safety Area (PSAs) through appropriate land use planning. Public Safety Areas include the area immediately at the end of runways where the risk to the public is highest. Certain developments and land uses are prohibited in the PSA for WSI including many indoor and outdoor recreational uses. Beyond the relatively small PSA area (which is not specific to aircraft noise), there are no other land use and planning restrictions to recreational areas as a result of aircraft noise from the project.

The *Western Sydney Aerotropolis Precinct Plan* identifies a range of future recreational areas and land uses within the Aerotropolis. The *Luddenham Village Interim Strategy* identifies open space and recreational areas planned as part of the village's revitalisation.

Beyond the Aerotropolis, land use planning associated with strategic planning initiatives (such as the SWGA) also have specific provisions to provide additional recreational areas to support future population growth although these are located beyond the ANEC contours for WSI and are unlikely to be affected planning provisions related to aircraft noise.

4.1.4 Industrial and commercial

The study area includes significant industrial areas located at Erskine Park, Eastern Creek and Hoxton Park and an array of small-medium commercial enterprises. The Erskine Park industrial estate and the Kemps Creek Recovery Park is located within the ANEC contours to north of WSI.

As outlined in Section 2.2.3, existing industrial and commercial land uses within the study area could continue in the future due to existing use rights. The Western Parkland City SEPP and AS 2021:2015 have guidance for industrial and commercial land uses in relation to aircraft noise as outlined in Table 4.2.

Table 4.2 Industrial and commercial land use Acceptability Based on ANEF Zones

Building type	ANEF zone of Site		
	Acceptable	Conditionally acceptable	Unacceptable
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

Development consent may be granted however if the consent authority is satisfied that the development will meet the indoor design sound levels as detailed in the AS 2021:2015 and outlined in Table 4.3.

Table 4.3 Commercial and industrial indoor design sound levels for determination of aircraft noise reduction (AS 2021:2015)

Building type (and activity)	Indoor design sound level (dB(A))
Commercial buildings, offices and shops	
• Private offices, conference rooms	55
• Drafting, open offices	65
• Typing, data processing	70
• Shops, supermarkets, showrooms.	75
Industrial	
• Inspection, analysis, precision work	75
• Light Machinery, assembly, bench work.	80

The *Western Sydney Aerotropolis Precinct Plan* identifies a range of future commercial and industrial areas and land uses within Aerotropolis supporting industrial, office and employment uses with a diversity of commercial spaces, community and public places.

Beyond the Aerotropolis, industrial and commercial land uses are likely to continue to expand to support population growth in the region including areas potentially within the ANEC contours for WSI (such as the Erskine Park area) and future planning approval will need to consider impacts from aircraft noise.

4.1.5 Health and education

The Penrith health and education precinct is the major cluster of health and educational land uses in the study area and is based around Nepean Hospital, the Western Sydney University Werrington Campus and Nepean College of TAFE Allied Health Facility. These areas are within the study area but well beyond the limits of the ANEC contours.

Luddenham Public School and Holy Cross Catholic Primary School are located within the Western Parkland City SEPP ANEC 20 contour.

As outlined in Section 4.1.1, the ANEC 20 contour for 2055 extends slightly beyond the prescribed ANEC 20 contour in several locations in the vicinity of Erskine Park, Eastern Creek and to the south of Wallacia. Mamre Anglican School is located within the ANEC 20 contour for 2055 and beyond the SEPP ANEC. Until an ANEF contour is approved for WSI, the prescribed WSI ANEC is to be used to inform land use planning. Any changes to relevant planning instruments as a result of adopting an ANEF could see planning conditions imposed on these additional areas.

Similar to residential areas, health and education facilities are deemed to be noise sensitive developments and the Western Parkland City SEPP outlines that new noise sensitive developments will be permitted within the ANEC 20 and above contours. Development consent may be granted however if the consent authority is satisfied that the development will meet the indoor design sound levels as detailed in the AS 2021:2015 and outlined in Table 4.4.

Table 4.4 Health and education indoor design sound levels for determination of aircraft noise reduction (AS 2021:2015)

Building type and activity	Indoor design sound level, dB(A)
Schools, universities	
• Libraries, study areas	50
• Teaching areas, assembly areas	65
• Workshops, gymnasias.	75
Hospitals, nursing homes	
• Wards, theatres, treatment and consulting rooms	50
• Laboratories	65
• Service areas.	75
Public buildings	
• Churches, religious activities	50
• Theatres, cinemas, recording studios	40
• Court houses, libraries, galleries.	50

The *Western Sydney Aerotropolis Precinct Plan* identifies specific land use areas designed for health and education services, mainly within the Aerotropolis Core precinct. As with residential areas of Aerotropolis, certain areas, specifically located within ANEC 20 will not be suitable for these land uses due to elevated aircraft noise.

4.2 Impacts of protected airspace

Protecting the airspace immediately around the Airport Site is essential to ensuring and maintaining a safe operating environment for aircraft and the long-term future growth of WSI. Structures and other activities that intrude into protected airspace have the potential to impact safe aviation operations at WSI. The prescribed OLS for WSI is shown on Figure 1.8 and extends outwards approximately 15 km from the centre of the Airport Site.

Building height restrictions on all land use types apply within the OLS.

Notwithstanding maximum building height controls, development that infringes on WSI's protected airspace is called a controlled activity and can include, but is not limited to:

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

Figure 4.2 outlines the maximum height for building types in different precincts of Aerotropolis and takes into account the restrictions on building height that would apply as a result of the OLS.

Building height controls within the study area (and generally) are outlined in the relevant LEPs unless otherwise specified within an overriding SEPP, or specific planning provision such as OLS. LEPs also provide 'height of building' maps which outline heights that are not to be exceeded for varying land use zones.

The Western Parkland City SEPP also contains provisions related to building height for specific growth precincts outlined within the SEPP including areas (Aerotropolis Precinct and Oran Park and Turner Road Precinct) within the study area and the maximum building heights are required to be contained within OLS limits established under the Western Parkland City SEPP.

The OLS applies to both building obstacles (e.g. antennae, masts or tall buildings) and hot or high velocity air emission (e.g. smokestacks, cooling towers) which may cause a potential hazard to aircraft. Emissions above certain velocities, or chimneys above specified heights, are considered potential hazards in accordance with the APAR. Developments with the

potential to exceed the OLS must be referred to the WSI operator and DITRDCA for review prior to the development being approved to proceed.

DITRDCA is in the process of engagement with state and local planning authorities as part of the process of declaring a new OLS under the APAR. Once declared the new prescribed OLS will be enforceable under the APAR and any amendments made to NSW planning instruments.

It is important to keep in mind that the elevation of the terrain varies across Western Sydney – the elevation of the Airport Site is 80.5 metres on the Australian Height Datum (AHD), and terrain elevation increases to the west towards the Blue Mountains escarpment. This means that the relative height of the OLS above ground level varies from one location to another, and must be considered carefully when determining if a development may be a controlled activity.

A PANS-OPS for WSI will be prepared once flight paths have been finalised.

Once this occurs, consent authorities are required under the Airports Act and the APAR to review all building and development applications they receive for any infringements into PANS-OPS. If an infringement is likely to occur, Regulation 8 provides that the local council must refer the application to the WSI operator. Airport operators must refer short-term PANS-OPS infringements (less than 3 months) to DITRDCA for approval. Long-term controlled activities (longer than 3 months) penetrating the PANS-OPS airspace are not permitted and WSA can notify the refusal of such controlled activities.

4.3 Impacts from wildlife buffers

Wildlife strikes, or sudden avoidance of wildlife can cause major damage to aircraft and/or reduction of safety. Certain land uses have the potential attract wildlife which can then migrate onto the WSI or into flights paths.

Land use planning decisions and the way in which existing land use is managed in the vicinity of airports, can significantly influence the risk of wildlife hazards. As examples, land uses such as agriculture, wildlife sanctuaries, wetlands and land fill sites can attract a high number of birds which increase the risk of interference with aviation activity (DITRDCA 2018).

NASF Guideline C provides a framework for how to manage the risk of wildlife strike on aircrafts. That framework has been incorporated into the Western Parkland City SEPP and Aerotropolis Precinct Plans. Land use planning around WSI has incorporated the implementation of wildlife buffer zones to mitigate risks of wildlife hazards.

There are a range of existing land uses within the study area which have the potential to attract wildlife including livestock production and commercial livestock feed businesses, turf farms and landscaping businesses and waste management facilities such as the Kemps Creek Resource Recovery Park.

These existing land uses can continue in the future due to existing use rights however mitigation of potential wildlife risks may be required in consultation with WSI and DPHI.

Any new development classed as 'relevant development' under the Western Parkland City SEPP and within the 13 km wildlife buffer of WSI will be subject to the wildlife management controls contained within the Western Parkland City SEPP.

Under the Western Parkland City SEPP:

- certain land uses are prohibited within the 3 km buffer zone including livestock processing industries, turf farming and management facilities
- development applications for specified uses on land within the 13 km buffer zone must be referred to WSA and accompanied by a wildlife hazard assessment and wildlife management plan, incorporating relevant mitigation and monitoring measures
- development applications for specified uses on land within the 13 km buffer zone must be accompanied by a waste management plan for the operation of the use of the land
- appropriate landscape species should be planted within these buffer zones.

WSA Co also has an obligation to monitor up to a 13 km radius around WSI for any potential wildlife hazards which may impact the 24-hour operations of WSI. WSA Co will negotiate with existing landowners to mitigate these risks.

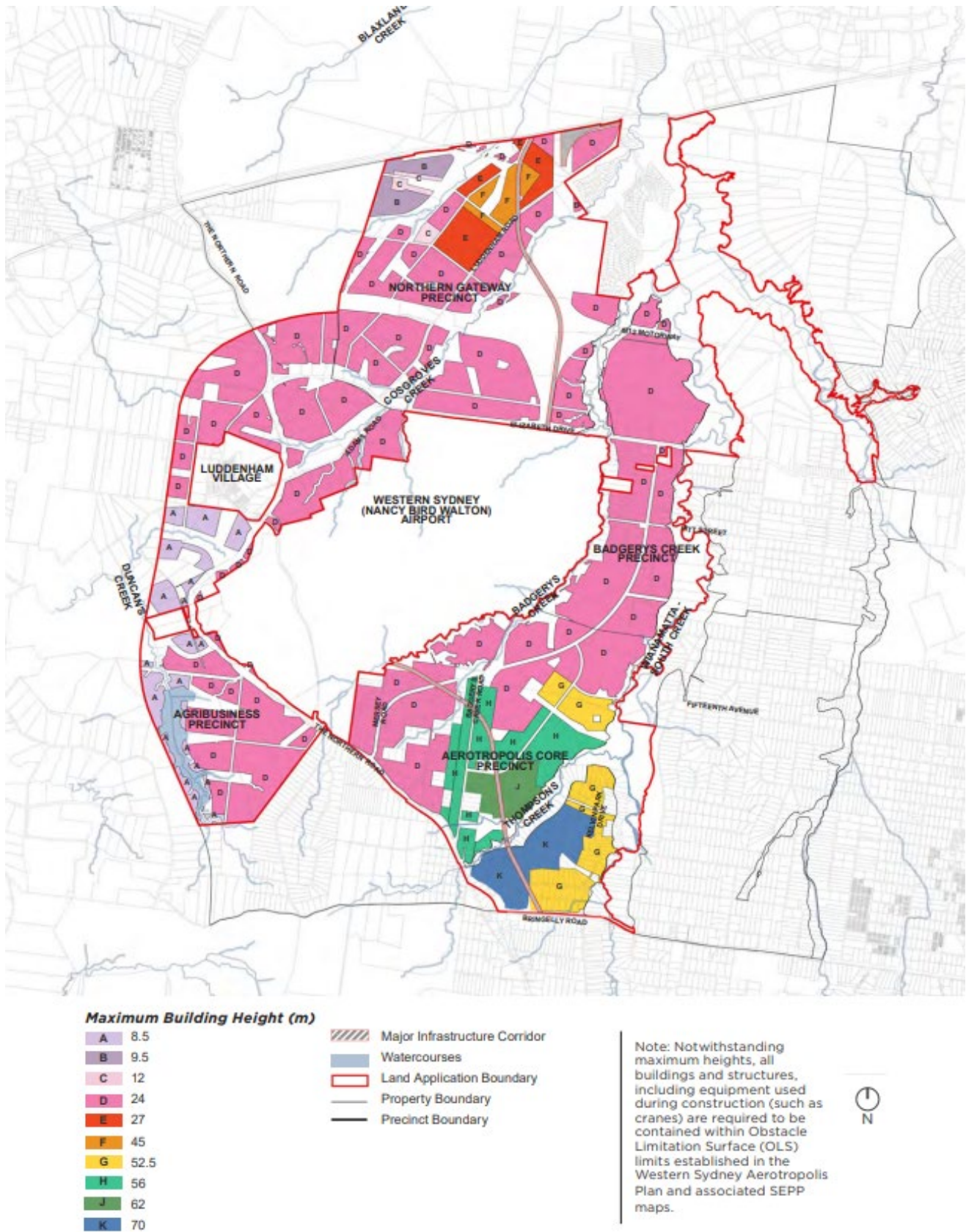


Figure 4.2 Height limits for buildings in Aerotropolis (Source: DPE 2022)

Chapter 5 Management and mitigation measures

This chapter provides an overview of the measures to manage potential land use and planning impacts associated with WSA's flight paths. It provides an overview of the broad objectives for management of land use impacts, as well as key measures for addressing impacts.

5.1 Existing management of land use in relation to WSI

Regulatory arrangements for air safety and planning around Australian airports are addressed through a number of existing Commonwealth, State and Local Government regulatory provisions. The National Airports Safeguarding Framework (NASF) in particular, provides guidance on planning requirements for developments that could potentially affect aviation operations and was formally endorsed by the Standing Council on Transport and Infrastructure in 2012. The NASF Principles recognise that responsibility for land use planning rests primarily with State, Territory and Local Government.

Strategic planning in the vicinity of WSI has considered and incorporated the operational needs of WSI into land use planning in accordance with guidance provided in the NASF. This has been ongoing for over a decade in conjunction with planning for WSI and is well established in existing planning instruments.

DITRDCA (formally Department of Infrastructure and Regional Development (DIRD)) undertook liaison with relevant state and local agencies to seek adoption of the necessary guidelines in applicable State environmental planning instruments to ensure development in the vicinity of WSI does not impede protected airspace. WSI's protected airspace was prescribed by declaration on 19 October 2017 under the provisions of the Airports Act and Airports (Protection of Airspace) Regulation 1996 (APAR). Since then, land use and development restrictions related to WSI's protected airspace has been factored into, relevant state and local planning instruments.

Land-use planning has also been an effective means to ensure that land use near WSI is compatible with noisy aviation activities, with a primary goal of minimising the population affected by aircraft noise, through implementation of land-use planning measures, such as land use zoning around WSI. Appropriate noise management controls referencing the NASF and AS 2021:2015 have also been included in applicable planning instruments in advance of WSI's airport operations.

Until the ANEF contour is approved for WSI, the ANEC contour presented as the Noise Exposure Contour Map in the Western Parkland City SEPP has been used to inform land use planning.

NASF Guideline C provides a framework for how to manage the risk of wildlife strike on aircrafts. That framework has been incorporated into the Western Parkland City SEPP and Aerotropolis Precinct Plans. Land use planning around WSI has also incorporated the implementation of wildlife buffer zones to mitigate risks of wildlife hazards.

The *Aviation Safeguarding Guidelines – Western Sydney Aerotropolis and surrounding areas* seek to ensure planning authorities consider the aircraft noise guidelines and noise exposure contour maps when undertaking land use planning for the Aerotropolis and surrounding areas of influence. Current planning provisions for land associated with Aerotropolis has been developed in conjunction with the Safeguarding Guidelines specifically to support the operation of WSI and limit potential restrictions on surrounding land uses.

To date, the range of existing planning controls in place in the vicinity of WSI have been an effective means of providing appropriate controls over land use planning and development.

5.2 Project specific mitigation measures

Table 5.1 provides a summary of mitigation and management measures identified for the proposal, indicating the relevant impact area and applicable mitigation measure.

Table 5.1 Summary of management measures

ID No.	Issue	Mitigation	Owner	Timing
LUP1	Aircraft noise	DITRDCA and WSA Co will continue to liaise with State and local government agencies to ensure applicable environmental planning instruments have regard to ANEC forecasts produced for the project.	DITRDCA and WSA Co	Pre-operation and operation
LUP2	Protected airspace	DITRDCA will continue to coordinate with relevant State and local government agencies to implement appropriate PANS-OPS requirements in applicable planning instruments to ensure future development does not impeded safe aircraft operations in accordance with the National Safeguarding Framework.	DITRDCA	Pre-operation and operation
LUP3	Wildlife buffers	WSA Co will continue to liaise with State and local government agencies to establish mechanisms that will identify land uses and prevent the creation of land uses that would cause hazardous wildlife attraction within the wildlife buffers.	WSA Co	Pre-operation and operation
LUP4	Wildlife buffers	WSA Co will negotiate with State and local government agencies and land owners if required on agreed action plans for monitoring and, where necessary, reducing wildlife attraction to areas in the vicinity of WSI.	WSA Co	Operation

5.3 Dependencies and interactions with other mitigation measures

As outlined in Section 1.7 this technical paper has interactions with other studies supporting the EIS. Interactions between mitigation measures in these technical papers that are relevant to land use and planning impacts include:

- Technical paper 1: Aircraft noise, specifically those relating to the implementation of the noise insulation and property acquisition policy, noise abatement procedures, noise complaints handling, the post-implementation review of the project and the establishment of a Community Aviation Consultation Group (CACG) to ensure appropriate community engagement on airport planning and operations. management mechanisms for flight path monitoring.
- Technical paper 5: Wildlife strike risk, including measures related to the monitoring and control of the presence of birds and other wildlife on or in the vicinity of WSI, the ongoing liaison with local Government and the establishment of a WSI Wildlife Hazard Management Committee.

Chapter 6 References

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- Western Sydney Airport – Environmental Impact Statement* (2016 EIS)
- Wollondilly Shire Council, 2020, *Wollondilly 2040: A Vision for the Future of Wollondilly – Local Strategic Planning Statement*

Appendix A

Education and health facilities in the study area

Table A.1 Education and health facilities in the study area

Facility type	Name	Suburb
Education facilities		
Child Care Centre	ROSSMORE COMMUNITY PRESCHOOL	Rossmore
Child Care Centre	WARRAGAMBA PRE-SCHOOL	Warragamba
Child Care Centre	SILVERDALE CHILD CARE CENTRE	Silverdale
Child Care Centre	KINGSWOOD PRE-SCHOOL	Kingswood
Child Care Centre	ORCHARD HILLS PRE-SCHOOL	Orchard Hills
Child Care Centre	DO RE MI PRE-SCHOOL	Mt Vernon
Child Care Centre	KEMPS CREEK CHILDRENS COTTAGE	Kemps Creek
Child Care Centre	MY FIRST SCHOOL CHILDCARE CENTRE	St Marys
Combined Primary-Secondary School	THOMAS HASSALL ANGLICAN COLLEGE	Middleton Grange
Combined Primary-Secondary School	PENRITH ANGLICAN COLLEGE	Penrith
Combined Primary-Secondary School	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	Kemps Creek
Combined Primary-Secondary School	GREEN VALLEY ISLAMIC COLLEGE	Green Valley
Combined Primary-Secondary School	UNITY GRAMMAR COLLEGE	Austral
Combined Primary-Secondary School	WOLLEMI COLLEGE	Werrington
Combined Primary-Secondary School	NEPEAN CHRISTIAN SCHOOL	Mulgoa
Combined Primary-Secondary School	MACARTHUR ANGLICAN SCHOOL	Cobbitty
Combined Primary-Secondary School	MAMRE ANGLICAN SCHOOL	Kemps Creek
Combined Primary-Secondary School	PENRITH CHRISTIAN SCHOOL	Orchard Hills
Combined Primary-Secondary School	WILLIAM CAREY CHRISTIAN SCHOOL	Prestons
Combined Primary-Secondary School	IRFAN COLLEGE	Cecil Park
Combined Primary-Secondary School	ORAN PARK ANGLICAN COLLEGE	Oran Park
Combined Primary-Secondary School	ST FRANCIS CATHOLIC COLLEGE	Edmondson Park
Primary School	GOOD SAMARITAN CATHOLIC COLLEGE	Hinchinbrook
Primary School	EDENSOR PARK PUBLIC SCHOOL	Edensor Park
Primary School	BRINGELLY PUBLIC SCHOOL	Bringelly
Primary School	COBBITTY PUBLIC SCHOOL	Cobbitty
Primary School	ST MARYS SOUTH PUBLIC SCHOOL	St Marys
Primary School	ST MARYS PUBLIC SCHOOL	St Marys
Primary School	OUR LADY OF THE ROSARY PRIMARY SCHOOL	St Marys
Primary School	OXLEY PARK PUBLIC SCHOOL	Oxley Park
Primary School	BUSBY WEST PUBLIC SCHOOL	Green Valley

Facility type	Name	Suburb
Primary School	HOXTON PARK PUBLIC SCHOOL	Hoxton Park
Primary School	LEPPINGTON PUBLIC SCHOOL	Leppington
Primary School	ST CLAIR PUBLIC SCHOOL	St Clair
Primary School	JAMES ERSKINE PUBLIC SCHOOL	Erskine Park
Primary School	BLACKWELL PUBLIC SCHOOL	St Clair
Primary School	AUSTRAL PUBLIC SCHOOL	Austral
Primary School	HOLY FAMILY PRIMARY SCHOOL	Luddenham
Primary School	WARRAGAMBA PUBLIC SCHOOL	Warragamba
Primary School	PENRITH SOUTH PUBLIC SCHOOL	Penrith
Primary School	JAMISONTOWN PUBLIC SCHOOL	Jamistown
Primary School	KINGSWOOD SOUTH PUBLIC SCHOOL	Kingswood South
Primary School	MULGOA PUBLIC SCHOOL	Mulgoa
Primary School	KINGSWOOD PUBLIC SCHOOL	Kingswood
Primary School	ST JOSEPH'S PRIMARY SCHOOL	Kingswood
Primary School	BETHANY CATHOLIC PRIMARY SCHOOL	Glenmore Park
Primary School	WALLACIA PUBLIC SCHOOL	Wallacia
Primary School	CLAREMONT MEADOWS PUBLIC SCHOOL	Claremont Meadows
Primary School	HINCHINBROOK PUBLIC SCHOOL	Hinchinbrook
Primary School	CLAIRGATE PUBLIC SCHOOL	St Clair
Primary School	TRINITY CATHOLIC PRIMARY SCHOOL	Kemps Creek
Primary School	KEMPS CREEK PUBLIC SCHOOL	Kemps Creek
Primary School	GLENMORE PARK PUBLIC SCHOOL	Glenmore Park
Primary School	SURVEYORS CREEK PUBLIC SCHOOL	Surveyors Creek
Primary School	YORK PUBLIC SCHOOL	South Penrith
Primary School	ORCHARD HILLS PUBLIC SCHOOL	Orchard Hills
Primary School	HOLY SPIRIT PRIMARY SCHOOL	St Clair
Primary School	BANKS PUBLIC SCHOOL	St Clair
Primary School	BONNYRIGG HEIGHTS PUBLIC SCHOOL	Bonnyrigg Heights
Primary School	GREENWAY PARK PUBLIC SCHOOL	Greenway Park
Primary School	CECIL HILLS PUBLIC SCHOOL	Cecil Hills
Primary School	MIDDLETON GRANGE PUBLIC SCHOOL	Middleton Grange
Primary School	BELLFIELD COLLEGE	Rossmore
Primary School	ROSSMORE PUBLIC SCHOOL	Rossmore

Facility type	Name	Suburb
Primary School	MONTGROVE COLLEGE	Orchard Hills
Primary School	MARION CATHOLIC PRIMARY SCHOOL	Horsley Park
Primary School	ST MARY MACKILLOP PRIMARY SCHOOL	South Penrith
High School	EMMAUS CATHOLIC COLLEGE	Kemps Creek
High School	CAROLINE CHISHOLM COLLEGE	Glenmore Park
High School	CLANCY CATHOLIC COLLEGE	West Hoxton
High School	FREEMAN CATHOLIC COLLEGE	Bonnyrigg Heights
High School	BOSSLEY PARK HIGH SCHOOL	Bossley Park
High School	ST MARYS SENIOR HIGH SCHOOL	St Marys
High School	HOXTON PARK HIGH SCHOOL	Hoxton Park
High School	KINGSWOOD HIGH SCHOOL	Kingswood
High School	JAMISON HIGH SCHOOL	South Penrith
High School	ST CLAIR HIGH SCHOOL	St Clair
High School	ERSKINE PARK HIGH SCHOOL	Erskine Park
High School	GLENMORE PARK HIGH SCHOOL	Glenmore Park
High School	PENRITH HIGH SCHOOL	Penrith
High School	COLYTON HIGH SCHOOL	Colyton
High School	JAMES BUSBY HIGH SCHOOL	Green Valley
High School	JOHN EDMONDSON HIGH SCHOOL	Horningsea Park
High School	CECIL HILLS HIGH SCHOOL	Cecil Hills
High School	ST BENEDICT'S CATHOLIC COLLEGE	Oran Park
High School	ST NARSAI ASSYRIAN CHRISTIAN COLLEGE	Horsley Park
Higher Education	UNIVERSITY OF SYDNEY JOHN BRUCE PYE FARM	Greendale
Higher Education	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	Kingswood
Higher Education	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	Penrith
Higher Education	UNIVERSITY OF SYDNEY COBBITTY FARM	Cobbitty Farm
Higher Education	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	Werrington South
Higher Education	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	Werrington North
Other educational facility	PUTLAND SCHOOL	Werrington
Other educational facility	ASPECT MACARTHUR SCHOOL	Cobbitty
Other educational facility	MATER DEI SCHOOL	Cobbitty
Other educational facility	ASPECT MACARTHUR SCHOOL WEST HOXTON	West Hoxton
Other educational facility	ASPECT WESTERN SYDNEY KEMPS CREEK TRINITY	Wetherill Park

Facility type	Name	Suburb
Other educational facility	ASPECT WESTERN SYDNEY KEMPS CREEK EMMAUS	Kemps Creek
Other educational facility	KURRAMBEE SCHOOL	Werrington
Other educational facility	PENRITH VALLEY SCHOOL	Werrington
Other educational facility	FERNHILL SCHOOL	Glenmore Park
Health facilities		
General Hospital	NEPEAN PRIVATE HOSPITAL	Kingswood
General Hospital	NEPEAN HOSPITAL	Kingswood
Medical Centre	ST CLAIR COMMUNITY HEALTH CENTRE	St Clair
Medical Centre	WARRAGAMBA EARLY CHILDHOOD HEALTH CENTRE	Warragamba
Nursing Home	CATHOLIC HEALTHCARE EMMAUS VILLAGE	Kemps Creek
Nursing Home	NEWMARCH HOUSE	Kingswood



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