ARTC

# BOTANY RAIL DUPLICATION

## TECHNICAL REPORT

**Technical Report 15 –**
Airport Operations Assessment

# Botany Rail Duplication - Environmental Impact Statement

## Technical Report 15 – Airport Operations Assessment

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# Glossary and abbreviations

| | |
|---|---|
| ABC | Airport Building Controller |
| ARTC | Australian Rail Track Corporation (the proponent) |
| ASA | Airservices Australia |
| Ballast | Material such as crushed rock or stone used to provide a foundation for a railway track. Ballast usually provides the bed on which railway sleepers are laid, transmits the load from train movements and restrains the track from movement. |
| Botany Line | A dedicated freight rail line (operated by ARTC) that forms part of the Metropolitan Freight Network. The line extends from near Marrickville Station to Port Botany. |
| CASA | Civil Aviation Safety Authority |
| CNS | Communications, navigational and surveillance facilities |
| construction ancillary facilities | Temporary facilities during construction that include, but are not limited to, construction work areas, sediment basins, temporary water treatment plants, pre-cast yards and material stockpiles, laydown areas, parking, maintenance workshops and offices, and construction compounds. |
| construction compound | An area used as the base for construction activities, usually for the storage of plant, equipment and materials, and/or construction site offices and worker facilities. |
| Controlled Activity | Controlled activities are those which include constructing or altering a building, or any other activity that causes a thing attached to or in physical contact with the ground to intrude into the prescribed airspace. |
| Council, the | Bayside Council |
| detailed design | The stage of design where project elements are design in detail, suitable for construction. |
| EIS, the | Botany Rail Duplication environmental impact statement |
| embankment | A raised area of earth or other materials used to carry a rail line in certain areas. |
| ERSA | En route supplement Australia (Airservices Australia) |
| existing rail corridor | The corridor within which the existing rail infrastructure is located. In the study area, the existing rail corridor is the Botany Line. |
| formation | The earthworks/material on which the ballast, sleepers and tracks are laid. |
| HIAL | High intensity approach lighting |
| heavy vehicles | A heavy vehicle is classified as a Class 3 vehicle (a two-axle truck) or larger, in accordance with the Austroads Vehicle Classification System. |
| impact | Influence or effect exerted by a project or other activity on the natural, built and community environment. |

| | |
|---|---|
| LGA | local government area |
| MDP | Major development plan |
| Manoeuvring area | That part of the aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons. |
| Metropolitan Freight Network | A network of dedicated railway lines for freight in Sydney, linking NSW's rural and interstate rail networks with Port Botany. The Metropolitan Freight Network is managed by ARTC. |
| MOS | Civil Aviation Safety Authority Manual of Standards |
| Movement area | That part of the aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s). |
| NASF | National Airports Safeguarding Framework |
| OLS | Obstacle limitation surface |
| PANS-OPS | Procedures for air navigation services – aircraft operations surfaces |
| Prescribed airspace | The airspace above any part of either the OLS or the PANS-OPS surfaces of an airport. The prescribed airspace is regulated under the Commonwealth Airports Act 1996. |
| possession | A period of time during which a rail line is closed to train operations to permit work to be carried out on or near the line. |
| project site, the | The area that would be directly affected by construction (also known as the construction footprint). It includes the location of operational project infrastructure, the area that would be directly disturbed by the movement of construction plant and machinery, and the location of the storage areas/compounds etc, that would be used to construct that infrastructure. |
| project, the | The construction and operation of the Botany Rail Duplication |
| Secretary's environmental assessment requirements (SEARs) | Requirements and specifications for an environmental assessment prepared by the Secretary of the Department of Planning and Environment under section 115Y of the *Environmental Planning and Assessment Act 1979* (NSW). |
| State significant infrastructure | Major transport and services infrastructure considered to have State significance as a result of size, economic value or potential impacts. |
| study area, the | The study area is defined as the wider area including and surrounding the project site, with the potential to be directly or indirectly affected by the project (e.g. by noise and vibration, visual or traffic impacts). The actual size and extent of the study area varies according to the nature and requirements of each assessment and the relative potential for impacts but which is sufficient to allow for a complete assessment of the proposed project impacts to be undertaken. |

# Executive summary

Australian Rail Track Corporation proposes to construct and operate a new second track within the existing Botany Line rail corridor between Mascot and Botany, in the Bayside local government area. The Botany Rail Duplication would increase freight rail capacity to and from Port Botany. The project is located in close proximity to Sydney Airport, with sections located near the Runway 25 threshold.

This Airport Operations report has been prepared to address the project SEARs and the requirements for a Major Development Plan under the *Airports Act 1996*. As stated in SEARs section 12 Hazards and Risks, part 12.2 states "The EIS must outline the impacts to the operation of the airport, including encroachment into the prescribed airspace, potential impacts to airport Communication, Navigation and Surveillance Systems, light spill and landscaping associated with the construction and operation of the project."

Through the assessment process there have been no unmitigated impacts identified, with the exception of trains being transient obstacles as per the existing rail alignment. This impact will require consultation with Sydney Airport Corporation Limited.

The following potential impacts are assessed in this report:

## Construction impacts

- Construction plant infringing the obstacle limitation surface.
- Construction lighting producing light spill in the direction of incoming aircraft.
- Dust production causing visibility issues in the airspace surrounding the airport.
- Risk of wildlife strikes due to attraction of wildlife to areas near airport operations.

The aforementioned construction impacts will be managed and mitigated through construction management plans and compliance with the legislation and relevant guidelines.

## Operational impacts

- Wind shear and turbulence due to new constructions in the vicinity of the airport.
- Light glare distracting and confusing pilots.
- Train heights and maintenance activities infringing the obstacle limitation surface.
- Wildlife strikes due to increased wildlife activity in the vicinity of the airport.

The aforementioned operational impacts will be managed and mitigated through compliance with the legislation and relevant guidelines, and consultation with Sydney Airport Corporation Limited.

## Cumulative

No cumulative impacts have been identified as part of this study.

# 1. Introduction

## 1.1 Overview

### 1.1.1 Background

Australian Rail Track Corporation (ARTC) proposes to construct and operate a new second track within the existing Botany Line rail corridor between Mascot and Botany, in the Bayside local government area (LGA). The Botany Rail Duplication ('the project') would increase freight rail capacity to and from Port Botany. The location of the project is shown in Figure 1.1.

The project is State Significant Infrastructure in accordance with Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). As State Significant Infrastructure, the project needs approval from the NSW Minister for Planning and Public Spaces.

This report has been prepared to accompany the environmental impact statement (EIS) to support the application for approval of the project, and address the Secretary of the Department of Planning and Environment's environmental assessment requirements (the SEARs), issued on 21 December 2018.

### 1.1.2 Overview of the project

The project would involve:

- Track duplication – constructing a new track predominantly within the rail corridor for a distance of about three kilometres.
- Track realignment (slewing) and upgrading – moving some sections of track sideways (slewing) and upgrading some sections of track to improve the alignment of both tracks and minimise impacts to adjoining land uses.
- New crossovers – constructing new rail crossovers to maintain and improve access at two locations (totalling four new crossovers).
- Bridge works – constructing new bridge structures at Mill Stream, Southern Cross Drive, O'Riordan Street and Robey Street (adjacent to the existing bridges), and re-constructing the existing bridge structures at Robey Street and O'Riordan Street.
- Embankment/retaining structures – construction of a new embankment and retaining structures adjacent to Qantas Drive between Robey and O'Riordan Streets and a new embankment between the Mill Stream and Botany Road bridges.

Further information on the key elements of the project is provided in the EIS.

Ancillary work would include bi-directional signalling upgrades, drainage work and protecting/relocating utilities.

Subject to approval of the project, construction is planned to start at the end of 2020, and is expected to take about three years, for the main construction works to be undertaken. Construction is expected to be completed in late 2023 with commissioning activities undertaken in early 2024.

It is anticipated that some features of the project would be constructed while the existing rail line continues to operate. Other features of the project would need to be constructed during programmed weekend rail possession periods when rail services along the line cease to operate.

The project would operate as part of the existing Botany Line and would continue to be managed by ARTC. ARTC is not responsible for the operation of rolling stock. Train services are currently, and would continue to be, provided by a variety of operators. Following the completion of works, the existing functionality of surrounding infrastructure would be restored.

Key features of the project are shown on Figure 1.2.

Figure 1.1 Botany Rail Duplication location

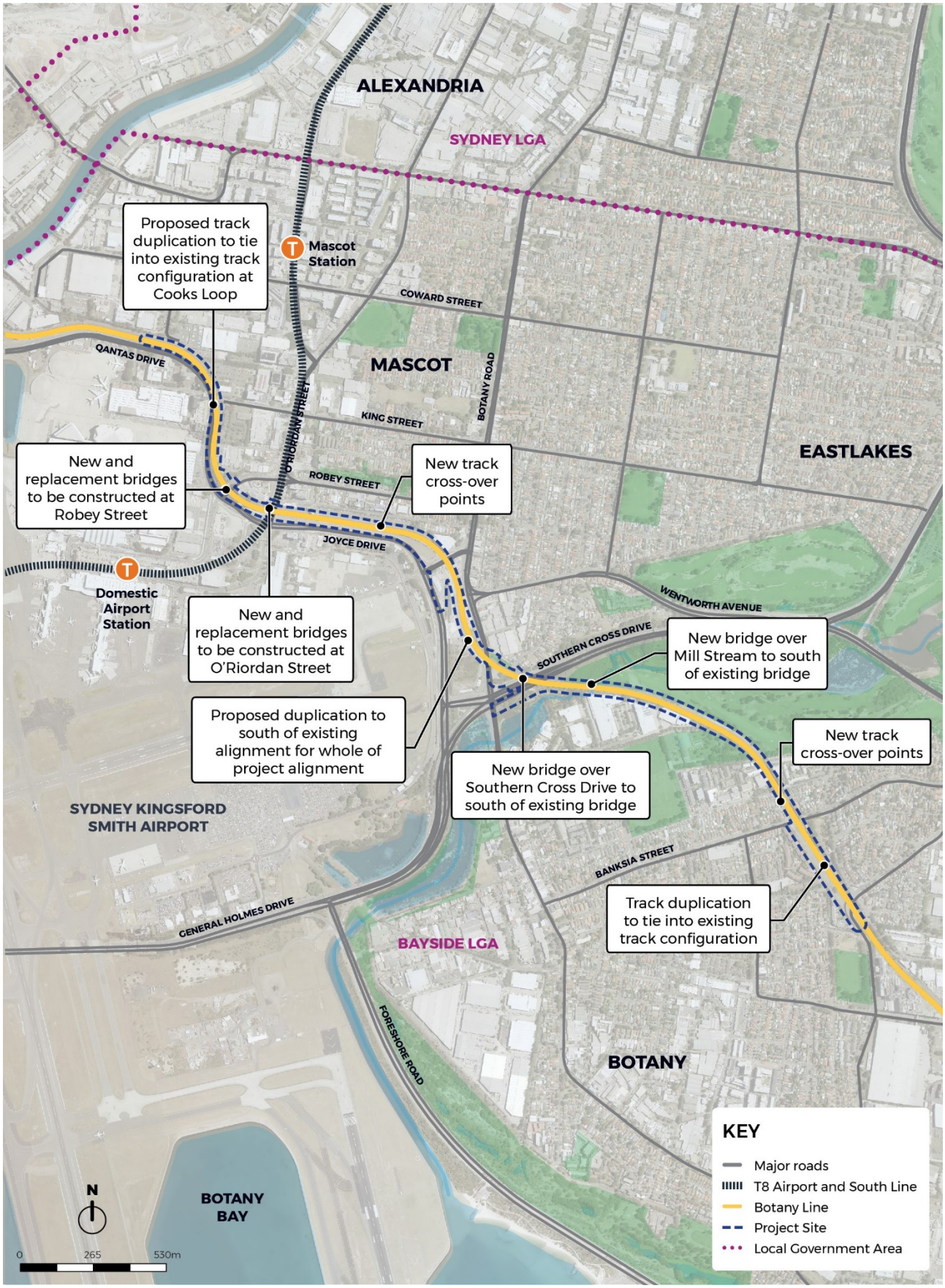


Figure 1.2 Botany Rail Duplication project overview

## 1.2 Purpose and scope of this report

The purpose of this report is to assess the potential impacts from the operation and construction of the project on airport operations at Sydney Airport. This airport operations assessment addresses the relevant SEARs for the EIS, as outlined in Table 2.1, and the requirements of *Airports Act 1996* as outlined in Section 2.2.1.

The report:

- describes the existing environment with respect to airport operations
- assesses the impacts of constructing and operating the project on airport operations
- recommends measures to mitigate the impacts identified.

## 1.3 Structure of this report

The structure of the report is outlined below:

- Section 1 Introduction – provides an introduction to the report.
- Section 2 Legislative and policy context – describes the legislative and policy context for the assessment, and relevant guidelines.
- Section 3 Methodology – describes the methodology for the assessment.
- Section 4 Existing environment – describes the existing environment as relevant to the assessment.
- Section 5 Impact assessment – describes the construction, operation and cumulative impacts on airport operations.
- Section 6 Management of impacts – describes the management of impacts identified in Section 5.
- Section 7 Conclusion – provides the conclusions of the assessment.

# 2. Legislative and policy context

This section summarises the legislation, guidelines and/or policies driving the approach to the assessment.

## 2.1 Relevant legislation, policies and guidelines

The assessment was undertaken with reference to the following:

- *Airports Act 1996 and regulations*
- *Airports (Environment Protection) Regulations 1997*
- *Airports (Protection of Airspace) Regulations 1996*
- *Civil Aviation Act 1988*
- *Civil Aviation Regulations 1998*
- *Sydney Airport Curfew Act 1995*
- *Sydney Airport Master Plan 2039*
- National Airports Safeguarding Framework[1].

These are discussed in further detail below.

## 2.2 Commonwealth legislation

### 2.2.1 *Airports Act 1996* and regulations

The project construction includes temporary construction compounds on areas of Commonwealth-owned land leased by Sydney Airport. The *Airports Act 1996* and associated regulations provide the assessment and approval process for development on Commonwealth-owned land for the operation of Sydney Airport. For the temporary compounds, consultation with Sydney Airport Corporation Limited is required to gain their consent. Following such consent, approval from the Airport Building Controller (ABC), acting as the delegate to the Secretary of DITCRD, may also be required. Where it is unclear whether an approval is required, project proponents are advised to consult the relevant ABC.

Controlled activities which would require consent are defined in Part 12, Division 4 of the Act. This defines controlled activities as:

> *(a) constructing a building, or other structure, that intrudes into the prescribed airspace;*
>
> *(b) altering a building or other structure so as to cause the building or structure to intrude into the prescribed airspace;*
>
> *(c) any other activity that causes a thing attached to, or in physical contact with, the ground to intrude into the prescribed airspace;*
>
> *(d) operating a source of artificial light, where:*
> *(i) the intensity of the light emitted exceeds the level ascertained in accordance with the regulations; and*
> *(ii) the light is capable of blinding or confusing pilots of aircraft operating in the prescribed airspace;*
>
> *(e) operating prescribed plant, or a prescribed facility, that reflects sunlight, where:*
> *(i) the intensity of the reflected sunlight exceeds the level ascertained in accordance with the regulations;*

[1] *National Airports Safeguarding Framework* | https://www.infrastructure.gov.au/aviation/environmental/airport_safeguarding/nasf/nasf_principles_guidelines.aspx

*and*
*(ii) the reflected sunlight is capable of blinding pilots of aircraft operating in the prescribed airspace;*

*(f) an activity that results in air turbulence, where:*
*(i) the level of the turbulence exceeds the level ascertained in accordance with the regulations; and*
*(ii) the turbulence is capable of affecting the normal flight of aircraft operating in the prescribed airspace;*

*(g) an activity that results in the emission of smoke, dust or other particulate matter, where:*
*(i) the emission exceeds the level ascertained in accordance with the regulations; and*
*(ii) the smoke, dust or particulate matter is capable of affecting the ability of aircraft to operate in the prescribed airspace in accordance with Visual Flight Rules;*

*(h) an activity that results in the emission of steam or other gas, where:*
*(i) the emission exceeds the level ascertained in accordance with the regulations; and*
*(ii) the steam or gas is capable of affecting the ability of aircraft to operate in the prescribed airspace in accordance with Visual Flight Rules.*

### 2.2.2 *Airports (Protection of Airspace) Regulations 1996*

Under the *Airports (Protection of Airspace) Regulations 1996*, a system has been established for the protection of airspace at and around regulated airports in the interests of the safety, efficiency or regularity of existing or future air transport operations. The regulations define prescribed airspace for an airport, which includes the airspace above any part of either an obstacle limitation surface (OLS) or procedures for air navigation services – aircraft operations surfaces (PANS-OPS). These regulations apply to both on-airport and off-airport developments.

Controlled activities are those which include constructing or altering a building, or any other activity that causes a thing attached to or in physical contact with the ground to intrude into the prescribed airspace. This includes cranes and other temporary structures. The regulations stipulate that for controlled activities, specific approval is required from the Secretary for the Department of Infrastructure, Regional Development and Cities. The proposal is to be submitted to the airport operator, in this case Sydney Airport Corporation Limited. The operator will then refer the proposal to the Secretary after inviting submissions from CASA, Airservices and the relevant building authority.

For short term controlled activities, which are those of less than 3-months, the Secretary may delegate authority to the airport-operator company. In this case the airport operator will invite submissions from CASA and ASA and may then approve the submission if appropriate.

This assessment considers potential activities or equipment from the project during construction or operation which may impact the OLS.

### 2.2.3 *Civil Aviation Act 1988* and regulations

The *Civil Aviation Act 1988* is one of two primary pieces of aviation safety legislation in Australia (the other being the Airspace Act 2007). The main object of the act is to establish a regulatory framework for maintaining, enhancing and promoting the safety of civil aviation, with particular emphasis on preventing aviation accidents and incidents. The act also has the purpose of establishing the Civil Aviation Safety Authority (CASA) with the functions of regulating:

- the civil air operations in Australian territory and
- the operation of Australian aircraft outside Australian territory.

Section 9A of the Act emphases that in exercising its powers and performing its functions, CASA must regard the safety of air navigation as its most important consideration.

This assessment has considered the requirements of CASA with regards to the safety of air navigation during construction and operational activities of the project.

### 2.2.4 *Civil Aviation Regulations*

The *Civil Aviation Regulations 1988* and *Civil Aviation Safety Regulations 1998* are administered by CASA. They provide regulatory controls over civil aviation safety. They set out in detail the safety standards that are required in relation to airworthiness of aircraft, licences and ratings of flight crew and maintenance personnel, air traffic control, rules of the air, dangerous goods and many other safety issues.

These regulations also authorise CASA to prepare and implement technical material and requirements (such as a Manual of Standards Civil Aviation Orders and other advisory material and publications) to document the standards and specifications necessary for the safety of air navigation and provide recommendations and guidance for methods of attaining compliance.

The following Manuals of Standards are relevant to the project and have been considered in this assessment:

- Manual of Standards Part 139 – Aerodromes
- Manual of Standards Part 172 – Air Traffic Services.

Regulation 94 of the *Civil Aviation Regulation 1989* also provides CASA the authority to require lights in the neighbourhood of an aerodrome which may cause confusion, distraction, or glare to pilots in the air, to be extinguished or modified. This may apply to either the project's construction lighting or to operational lighting from train movements or maintenance activities. Impacts from lighting are considered in the impact assessment of this report.

### 2.2.5 *Sydney Airport Curfew Act 1995*

A curfew period exists for Sydney Airport from 11 pm until 6 am on the following day. During this time there are strict restrictions on aircraft operations. Some operations are allowed for international flights during shoulder periods from 11 pm to midnight, and from 5 am to 6 am (Section 12 of the Act). During such operations, take-off is only permitted from runway 16R, and landings only permitted to runway 34L.

Certain specified aircraft are permitted to operate cargo flights (Section 13 of the Act) during the curfew, and some smaller aircraft, with maximum take-off weights up to 34,000 kilograms complying with maximum noise levels may also operate (Section 14 and 15) with the same restriction on runway use as detailed above.

The runway restrictions mean that aircraft are operating over Botany Bay, with take-offs to the south and landings to the north. This in turn means that aircraft operations during curfew hours are not over the project site, although airspace protection will remain in place and all controlled activities will need appropriate approvals in accordance with the *Airports (Protection of Airspace) Regulations 1996*.

## 2.3 Other relevant guidelines or policy

### 2.3.1 *Sydney Airport Master Plan 2039*

As per the *Airport Act 1996* requirements, Sydney Airport Corporation Limited is required to have an approved Master Plan. *Sydney Airport Master Plan 2039* (Sydney Airport 2019), outlines the strategic direction for development of the airport over the next 20 years.

The Plan has been developed by Sydney Airport Corporation Limited to identify development plans to accommodate the forecast 51 per cent increase in passenger numbers over the next 20 years. Section 13.3.4 (AD3 – Airport Logistics and Support) of the Master Plan details the land use of the Northern Lands Sector of Sydney Airport has been identified as a zone encompassing the nearby Sydney Gateway road project.

A description of the criteria used from this plan is discussed in Section 3.3.1.

### 2.3.2 National Airports Safeguarding Framework

The Australian Government Department of Infrastructure, Regional Development and Cites (n.d.) National Airports Safeguarding Framework (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 provides guidance to state, local and territory governments on assessment and approvals for land use and development on and around airports, including those that might penetrate operational airspace and/or affect navigational procedures for aircraft. The NASF applies at all airports in Australia.

The NASF was developed by the National Airports Safeguarding Advisory Group, which includes representatives from Commonwealth Infrastructure and Defence departments and aviation agencies; state and territory planning and transport departments; and the Australian Local Government Association.

As noted in Section 16.4.1 of the *Sydney Airport Master Plan 2039* (Sydney Airport 2019), Sydney Airport Corporation Limited has been working with NSW Government and local councils to ensure planning decisions in areas outside of Sydney Airport have regard to or comply with the Framework guidelines. A state-wide approach to implementation of the NASF is under development by NSW Department of Planning and Industry.

The principal components of the NASF are shown in Figure 2.1.

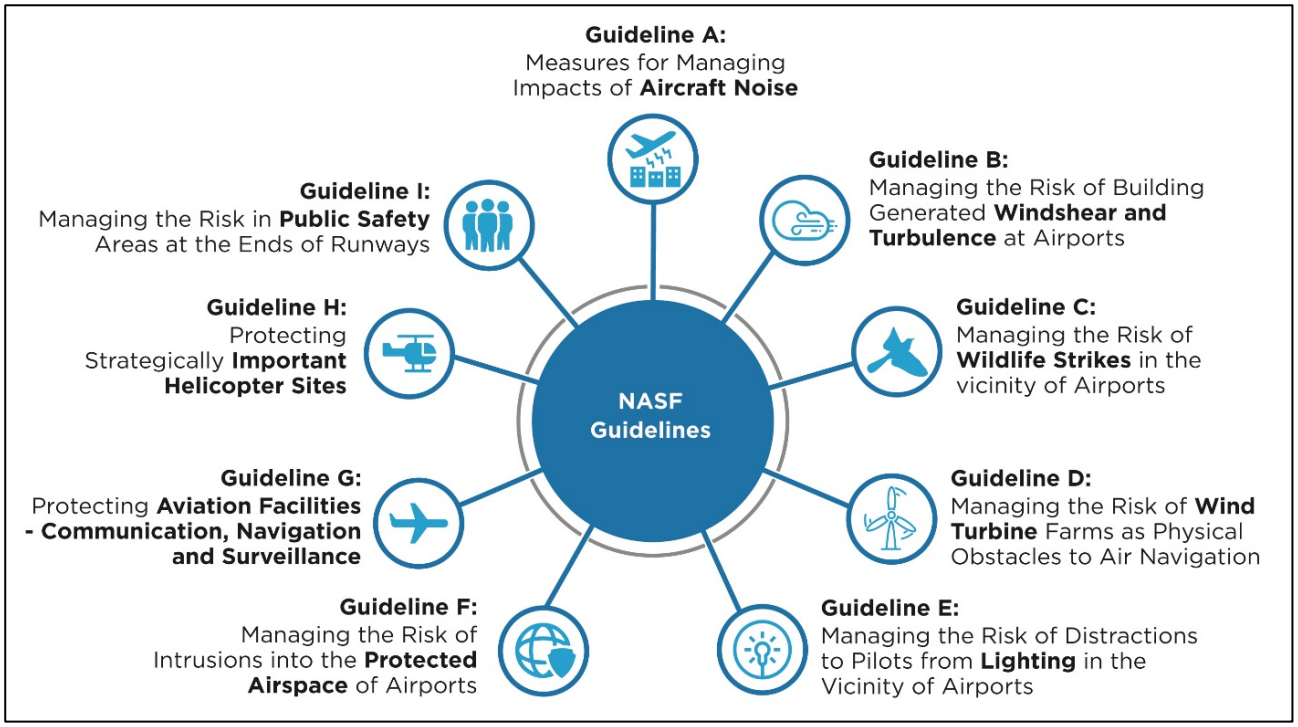


Figure 2.1 NASF guidelines

The project passes under the approach and departure paths for one of the runways at Sydney Airport. The relevant Guidelines to be included in this assessment are B, C, E, F, G and I.

### 2.3.3 Sydney Airport Wildlife Management Plan

Chapter 10, Section 10.2 of Civil Aviation Safety Authority Manual of Standards (MOS) Part 139 requires that routine inspections are undertaken to identify "….birds and animals on, or in the vicinity of, the movement area" and that "bird hazard mitigation procedures are incorporated in the environmental management procedures for the aerodrome".

Sydney Airport has implemented a Wildlife Management Plan which provides guidance to minimise the hazard to aircraft operations created by the presence of wildlife on or in the vicinity of the airport. The plan includes regular fauna monitoring and population counts of birds as well as maintenance of a bird and animal species list to assist in identifying different species. Information on bird counts and bird strike information is collected from airport management staff, airlines and air traffic controllers and distributed to relevant parties.

Management actions include a number of passive to direct controls (i.e. culling) which is triggered by the hazard potential and conducted on an 'as required' basis. The plan also includes a landscaping policy to reduce vegetation which will attract birds that may increase the number of bird strikes.

Sydney Airport also convenes a wildlife control working group which includes representatives from Sydney Airport, NSW Government agencies, local government authorities and other key stakeholders. The working group determines the most appropriate strategies to manage bird hazards for the airport.

This plan is considered when assessing the construction and operational activities for project features which may encourage wildlife that could cause a risk to airport operations.

## 2.4 Secretary's environmental assessment requirements

The SEARs relevant to airport operations, together with a reference to where they are addressed in this report, are outlined in Table 2.1.

Table 2.1 SEARs relevant to this assessment

| Requirements | | Where addressed in this report |
|---|---|---|
| **3. Assessment of Key Issues*** (2) For each key issue the Proponent must: | | |
| **a)** | describe the biophysical and socio-economic environment, as far as it is relevant to that issue; | Section 4 |
| **b)** | describe the legislative and policy context, as far as it is relevant to the issue; | Section 2 |
| **c)** | identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence (including worst case scenario) of the impact (comprehensive risk assessment), and the cumulative impacts; | Section 5 |
| **d)** | demonstrate how options within the project potentially affect the impacts relevant to the issue; | Section 5 |
| **e)** | demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies); | Section 5 |
| **f)** | detail how likely impacts that have not been avoided through design will be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant); and | Section 6 |
| **g)** | detail how any residual impacts will be managed or offset, and the approach and effectiveness of these measures. | Section 6 |
| **12. Hazards and Risks** (2) The Environmental Impact Statement must outline the impacts to the operation of the airport, including encroachment into the prescribed airspace, potential impacts to airport Communication, Navigation and Surveillance Systems, light spill and landscaping associated with the construction and operation of the project. | | Section 5 |

# 3. Methodology

This section describes the methodology used to undertake the airport operations assessment.

## 3.1 Study area

The project site is located within the vicinity of Sydney Airport as shown in Figure 1.1. Although outside of the airport boundary, the project does interface with the obstacle limitation surface, which spans for a radius of about 15 kilometres from the runway ends. The obstacle limitation surface is described in Section 4.3.

Infrastructure and terrain within this area requires assessment under NASF Guideline G. Sydney Airport Corporation Limited have provided a three dimensional computer model of the OLS. The design of the project has also been modelled and this allows comparisons between the two models. The study area therefore considers the vertical and horizontal boundary of the project site.

## 3.2 Key tasks

This assessment was carried out to determine the impacts to airport operations by the following:

- construction activities and equipment
- operational activities and equipment
- cumulative effects of the project combined with other nearby development proposals and construction projects.

### 3.2.1 Construction impacts methodology

A desktop assessment of potential construction impacts of the project was undertaken to determine how construction works will co-ordinate with airport operational restrictions. The desktop assessment involved:

- a review of the project location and design with respect to the legislation, guidelines and policies listed in Section 2
- development of a 3D design model of the project during construction
- review of the digital 3D protected airspace data provided by Sydney Airport Corporation Limited.

The 3D design model of the construction footprint was compared to the digital 3D protected airspace data to identify activities which could potential impact the protected airspace. Outcomes of this assessment are detailed in Section 5.1.

Detailed description of construction methodology is discussed in EIS Chapter 7.

### 3.2.2 Operational impacts methodology

A desktop assessment of potential operational impacts of the project was undertaken to determine how operation and maintenance of the permanent infrastructure will co-ordinate with airport operational restrictions. This included:

- a review of the project location and design with respect to the legislation, guidelines and policies listed in Section 2
- development of a 3D design model of the operation of the project
- review of the digital 3D protected airspace data provided by Sydney Airport Corporation Limited.

The 3D design model of the operational project was compared to the digital 3D protected airspace data to identify operational activities which could potential impact the protected airspace. Outcomes of this assessment are detailed in Section 5.2.

Detailed description of project features and operational activities are discussed in EIS Chapter 6.

## 3.3 Key assessment criteria

Impacts that are identified during the methodologies above were then assessed with respect to the following documents and guidelines to determine suitable mitigation measures.

### 3.3.1 Sydney Airport Master Plan 2039

The *Sydney Airport Master Plan 2039, (Sydney Airport 2019)* has been reviewed in relation to the Botany Rail Duplication project.

The Sydney Airport Master Plan 2039 outlines the strategic direction for development of the airport over the next 20 years. Map 17: Proposed Sydney Gateway (in the Sydney Airport Master Plan 2039) identifies the location of the Botany Rail Duplication and the project has been assessed as consistent with this layout.

### 3.3.2 Cumulative impacts methodology

A desktop assessment of other key development proposals near the project was undertaken to determine potential cumulative impacts to airport operations. Outcomes of this assessment are detailed in Section 5.3.

### 3.3.3 Approach to National Airports Safeguarding Framework

The National Airports Safeguarding Framework[2] 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 National Airports Safeguarding Framework provides guidance on planning requirements for development that affects aviation operations. This includes building activity around airports that might penetrate operational airspace and/or affect navigational procedures for aircraft.

The Framework was developed by the National Airports Safeguarding Advisory Group, which includes representatives from: Commonwealth Infrastructure and Defence departments and aviation agencies; state and territory planning and transport departments; and the Australian Local Government Association.

[2] *National Airports Safeguarding Framework* | https://www.infrastructure.gov.au/aviation/environmental/airport_safeguarding/nasf/nasf_principles_guidelines.aspx

The framework includes the following sections:

Principles for National Airports Safeguarding Framework

- Guideline A: Managing Aircraft Noise
- Guideline B: Managing Building Generated Windshear and Turbulence
- Guideline C: Managing Wildlife Strike Risk
- Guideline D: Managing Wind Turbine Risk to Aircraft
- Guideline E: Managing Pilot Lighting Distraction
- Guideline F: Managing Protected Airspace Intrusion
- Guideline G: Communications, Navigation and Surveillance
- Guideline H: Protecting Strategically Important Helicopter Landing Sites
- Guideline I: Managing the Risk in Public Safety Areas at the Ends of Runways.

The potential impacts of the project have been reviewed against the guidelines and assessment made of any mitigation measures that may reduce or illuminate impacts.

# 4. Existing environment

## 4.1 Overview of key infrastructure facilities and current airport operations

Sydney Airport is Australia's largest airport in terms of passengers and freight. It is located on about 907 hectares of land adjoining Botany Bay in Mascot, approximately eight kilometres south of Sydney's Central Business District. Sydney Airport currently caters for around 40 per cent of Australia's international passenger movements, 46 per cent of domestic/regional passenger movements and 50 per cent of air freight. In 2017, there were around 43 million trips to Sydney Airport and the airport also moved about 643,000 tonnes of freight.

There are currently 34 international, six domestic and six regional airlines operating from the airport, together servicing 97 destinations, including 11 international and eight regional destinations not served by any other Australian airport.

Sydney Airport operates three passenger terminals, comprising an international terminal (Terminal 1) located in the north-west sector of the airport and a domestic terminal complex (housing Terminals 2 and 3) in the north-east sector of the airport.

Sydney Airport has three runways, comprising two parallel runways on an approximate north−south alignment and a cross runway on an east−west alignment. The two north-south runways are equipped with HIAL lighting systems and all runways are equipped with Instrument Landing Systems.

Runway 16R/34L is the main runway for the airport and is 3,962 metres in length. It parallels the shorter (2,438 metre) Runway 16L/34R, which was completed in 1994. Runway 07/25 is the cross runway and is approximately 2,530 metres long, on an approximate east−west alignment through the centre of the airport. The runways and their supporting taxiways can accommodate operations of aircraft up to and including the Airbus A380 (currently the world's largest passenger airliner).

Apron areas are provided to facilitate aircraft parking (the parking position is known as an aircraft 'stand' or 'gate'). There are 106 aircraft stands dedicated to supporting international, domestic, regional and freight operations at Sydney Airport. The apron areas also support activities associated with the servicing of aircraft such as baggage handling, movement of freight, refuelling and in-flight catering. A network of airside roads provides for ground support equipment and other vehicle movements.

The general aviation parking area is located in the north-east sector of the airport, east of T2/T3. The area provides aircraft parking for a number of freight, corporate and private aircraft as well as a variety of aviation support facilities such as maintenance hangars, freight handling and administrative buildings.

There are four international cargo terminal operators and two domestic cargo terminal operators operating at Sydney Airport. A helicopter precinct is located in the south-east sector of the airport, which includes a touchdown and lift off area, taxiways, parking pads, storage/maintenance hangars and administrative buildings.

The air traffic control tower, a Commonwealth heritage listed item, is roughly in the centre of the airport adjacent to the General Holmes Drive tunnel under runway 16R/34L.

Figure 4.1 shows the location of key facilities at Sydney Airport.

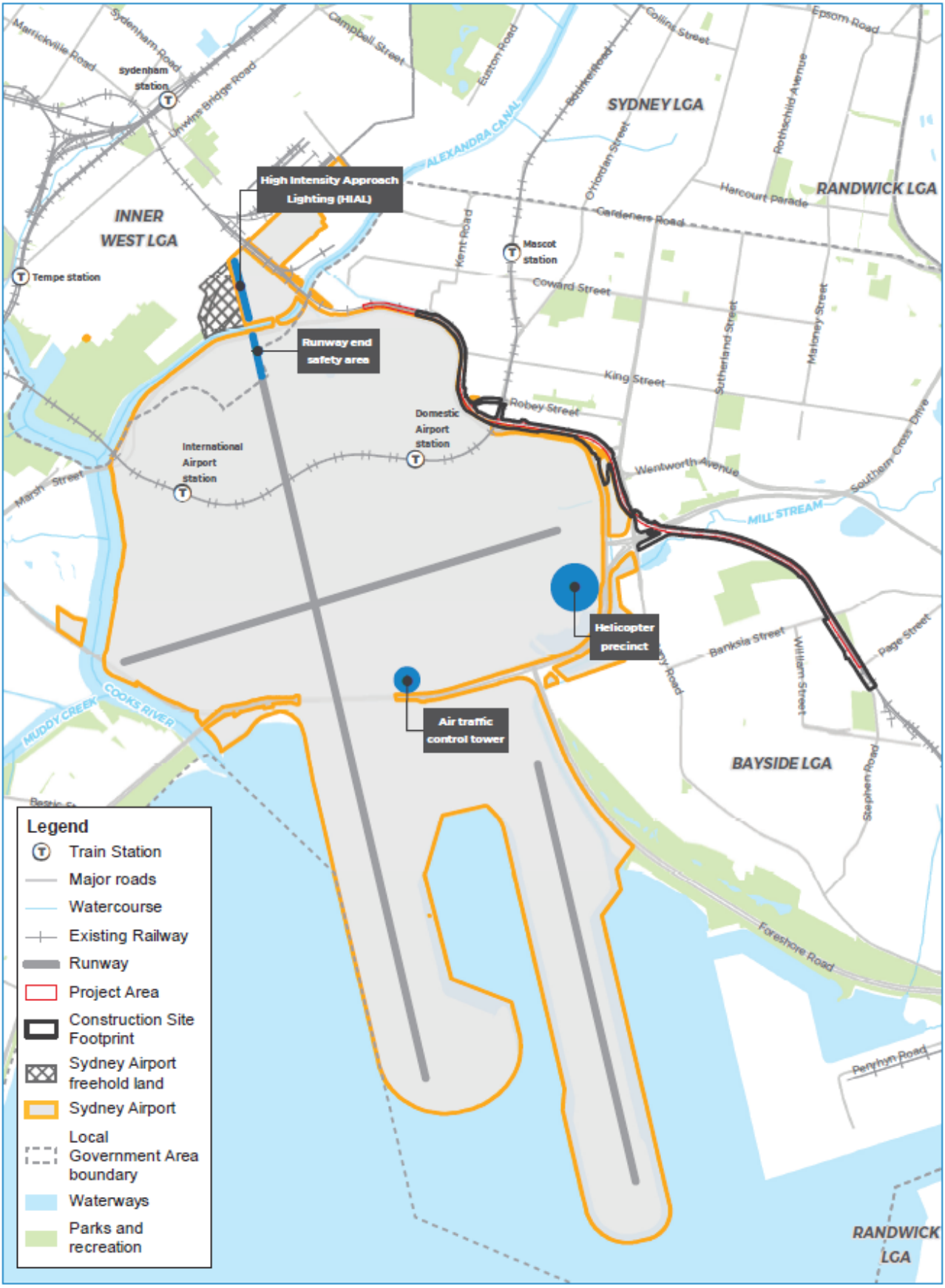


Figure 4.1 Location of key facilities at Sydney Airport

### 4.1.1 Curfew

The airport operates in accordance with the *Sydney Airport Curfew Act 1995*, which restricts operations between 11 pm and 6 am the following day. During these hours only limited flights are allowed, and these land and take off over Botany Bay on runway 16R/34L.

## 4.2 Aviation safety

The Australian Transport Safety Bureau (ATSB, 2018) reported that in 2017, nearly 200 aircraft were involved in accidents in Australia, with 203 involved in a serious incident (an incident with a high probability of an accident). There were 40 fatalities in the aviation sector in 2017 which was a significant increase from the 21 fatalities in 2016. There were no fatalities associated with either high or low capacity commercial passenger transport operations, which has been the case since 1975 and 2010 respectively.

Almost half of all fatalities that occurred in commercial passenger transport operations over the period 2008–2017 occurred in 2017. During 2017, there were 14 fatalities from 21 accidents in commercial passenger transport operations, 21 fatalities from 93 accidents in general aviation operations, and five fatalities from 53 accidents in recreational aviation operations. This indicates commercial passenger transport operations are one of the safest forms of aviation activity.

Aircraft control, followed by terrain collisions, were the most common accident type for aircraft involved in commercial air transport operations.

Wildlife strikes, including bird strikes, were the most common type of incident involving both commercial air transport and general aviation operations. Runway events and aircraft control incidents were the most common types of incident reported for recreational aviation.

Aeroplanes remain the most common aircraft type flown, which is reflected in the proportion of accidents they are involved in. In 2017, 15 of the 22 fatal accidents involved aeroplanes—three gliders, two helicopters, and two weight shift aircraft were also involved in fatal accidents.

Figure 4.2 shows the incidence of various types of accidents involving high capacity commercial passenger transport aeroplanes within 50 kilometres of Sydney Airport between 2008 and 2017 (National Transport Safety Bureau National Aviation Occurrence Database). As indicated above, the graph shows there have been no fatal accidents and few serious accidents over a ten year period.

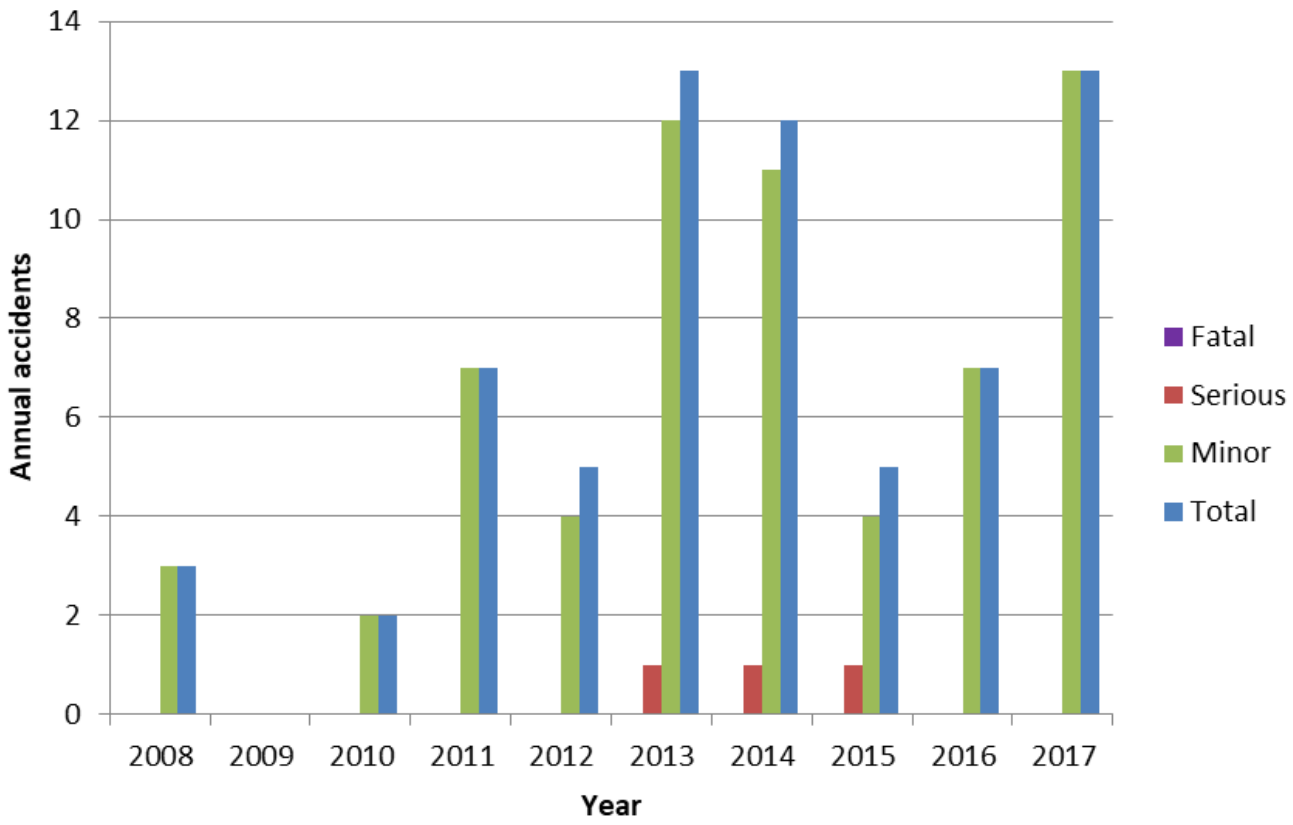


Figure 4.2 Accidents within 50 km of Sydney Airport involving high capacity commercial aeroplanes 2008–2017

## 4.3 Obstacle limitation surface

The OLS at Sydney Airport spans a radius of about 15 kilometres from the runway ends and is part of the prescribed airspace as defined in the *Airports (Protection of Airspace) Regulations 1996*. The OLS is a series of heights associated with each runway at an airport that defines the desirable limits to which objects may project into the airspace around the airport so that aircraft operations at the airport may be conducted safely. The OLS is primarily related to operations where pilots are flying in good visibility and using visual cues. Infrastructure and terrain within this area is required to be at a height below the OLS to avoid becoming a hazard to aircraft operations. The portion of the OLS at Sydney Airport in the vicinity of the project is shown in Figure 4.3.

The lowest point of the OLS directly over the project occurs in the approach and departure path for runway 07/25. The OLS model provided by Sydney Airport shows that this lowest point is at 12.48 mAHD, with the corresponding level of the project at 11.36 mAHD.

Although flight operations at Sydney Airport are generally limited to the curfew hours detailed in Section 4.1.1, there are some exceptions to this for runway 16R/34L, and as such the OLS applies at all times.

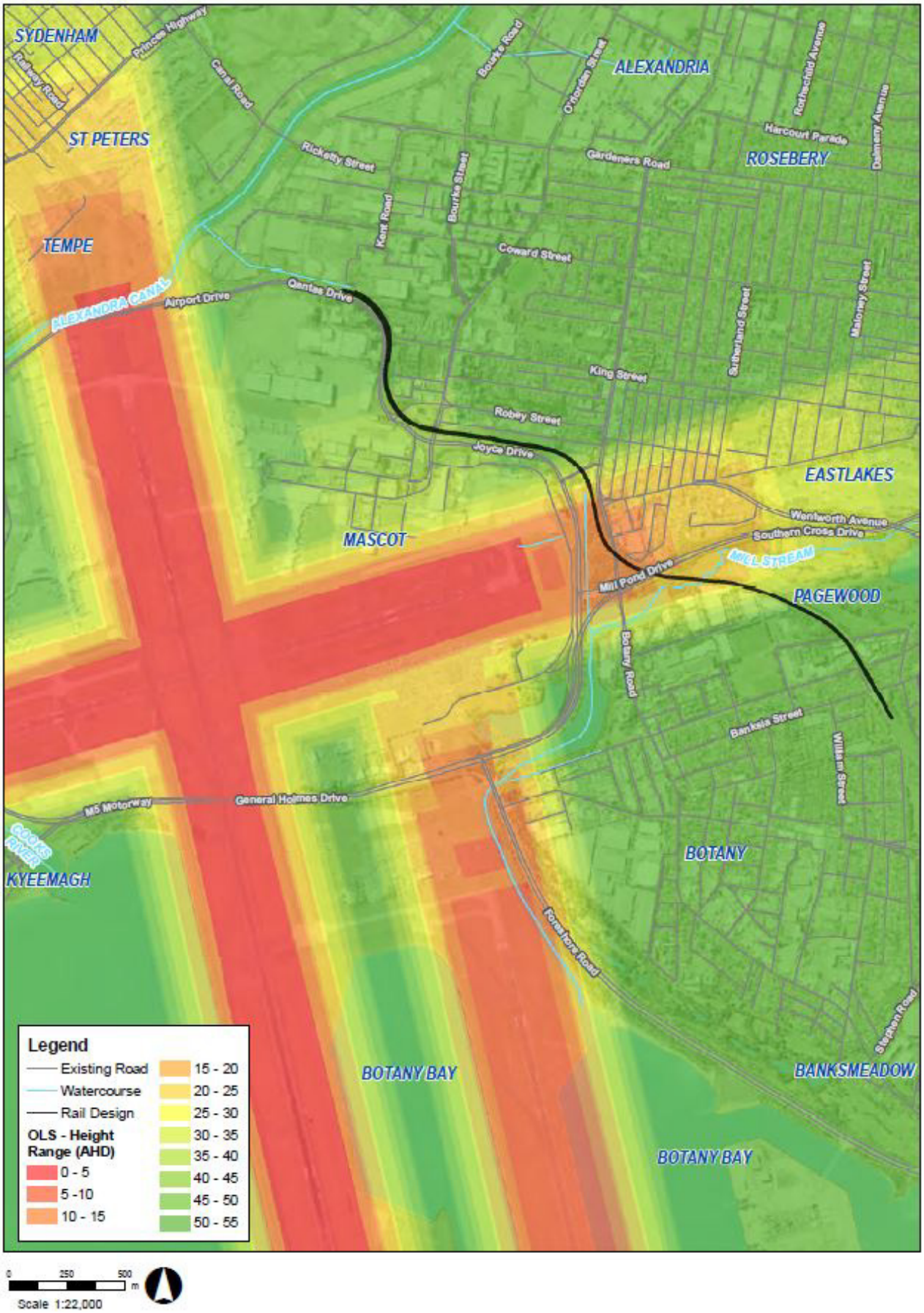


Figure 4.3 OLS surfaces at Sydney Airport

## 4.4 Procedures for Air Navigational Services – Aircraft Operations (PANS-OPS) Surface

The PANS-OPS surface is designed to avoid collisions between aircraft and obstacles when the aircraft are flying in low visibility conditions and guided primarily by instruments. Such instruments include the instrument landing systems (ILS) which comprise ground based transmitters that provide guidance to aircraft for approach bearing (localiser systems) and approach angles (glidepath systems).

The project passes closest to the airport at the end of runway 07/25. The PANS-OPS is located above the OLS and therefore the OLS is the critical surface for the project to be assessed against for intrusions.

## 4.5 Aerodrome obstacles

Obstacles, including transient obstacles that infringe the obstacle limitation surface are published by Airservices Australia on the airport's *Aeronautical Information Package* (AIP) so that pilots are aware. The AIP for Sydney Airport notes that freight trains operating on the existing Port Botany line currently cause a transient infringement of the runway 25 approach and the runway 07 takeoff OLS. The highest point of the freight containers during the infringement is advised as 56 feet (around 17.07 metres) above mean sea level, and 15 feet (4.57 metres) above ground level.

## 4.6 Communications, navigational and surveillance facilities

The communications, navigation and surveillance infrastructure and facilities at Sydney Airport enable pilot navigation, instrument approach procedures, communication between pilots and air traffic control and monitoring of aircraft locations by air traffic control. NASF Guideline G relates to required clearances from specific communications, navigation and surveillance (CNS) systems associated with air transport. This includes civilian and defence facilities.

Development that may impact CNS includes bridges as well as construction equipment such as tall cranes and concrete pumps.

Airservices Australia (ASA) and Defence provide coordinates for their CNS facilities to States and Territories. ASA also provide assistance as required in assessing impacts of projects on CNS.

An assessment under Guideline G requires a project proponent to seek advice from the planning authority as to whether any infringement of CNS building restricted areas will occur. Where such infringement is possible, the planning authority will refer the proposal to Airservices Australia for specialist engineering analysis.

# 5. Impact assessment

## 5.1 Impacts during construction

### 5.1.1 Construction impacts overview

Construction works have the ability to impact airport operations due to either height of construction plant, construction lighting, or dust production. All these factors can present hazards to arriving and departing aircraft. The *Airports Act 1996 – Part 12 - Division 4 – Protection of prescribed airspace* is defined in Section 2.2.1.

The following *National Airports Safeguarding Framework Guidelines* apply to the construction impacts of the Botany Rail Duplication project:

- Guideline C – Managing the risk of wildlife strikes in the vicinity of airports.
- Guideline E – Managing the risk of distractions to pilots from lighting in the vicinity of airports.
- Guideline F – Managing the risk of intrusions into the protected operational airspace of airports.

### 5.1.2 Construction plant

During construction works, it is anticipated that there will be some intrusions into the OLS. This would include activities such as piling, embankment/retaining wall works and cranes required for bridge construction, as well as any other construction activity where plant and equipment is required to be placed within the OLS zone. The track work and backfilling of the retaining walls would require plant (hi-rail dump trucks, excavators, cranes) that would encroach the OLS. Dump trucks would also be required to operate at full lift while excavators can be operated with height restrictors. The 'Processing Applications under the *Airports (Protection of Airspace) Regulations 1996* Guideline for Operations of Federal Airports' requires any such operations to be approved by the airport operator.

Construction plant associated with the project site, including cranes and piling rigs, are to remain below the obstacle limitation surface as described in Section 4.3 wherever possible. Where the work area requires cranes or other high plant, to operate above the obstacle limitation surface, a Crane Enquiry Form (Application for Approval of Crane Operation), in line with sections s.182, 183, *Airports Act 1996*, and *Airports (Protection of Airspace) Regulations 1996* – Reg 7 must be completed and submitted to Sydney Airport Corporation Limited.

The construction methodology identifies where there are operations likely to cause short term intrusion into the airspace. These will be further assessed at detailed design in consultation with Sydney Airport Corporation Limited and the relevant approval process followed.

A number of temporary crane zones would be established where large cranes are required to work. These locations are shown on Figure 5.1 and Figure 5.2 at the Robey Street, O'Riordan Street bridge, Southern Cross Drive and Mill Stream work locations and also at the General Holmes Drive work area. These areas would only be in use during short periods when cranes are required. At this stage, it is assumed that activities that intrude OLS would be required to be undertaken during the curfew hours of Sydney Airport (between 11 pm and 6 am). Where work is required to be undertaken outside of this time, it is expected that ARTC and the construction contractor would consult with Sydney Airport to seek relevant approval exemptions and crane permits (as required).

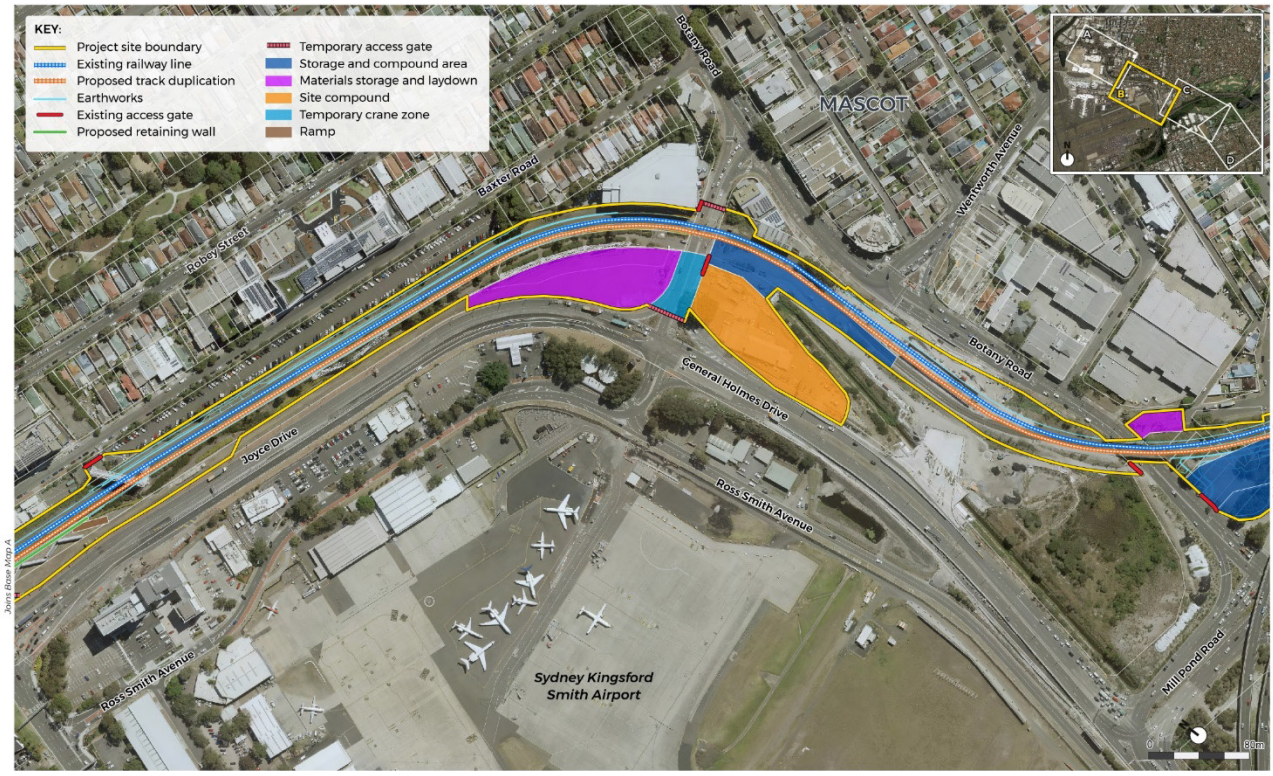


Figure 5.1 Construction zones including proposed temporary crane zone

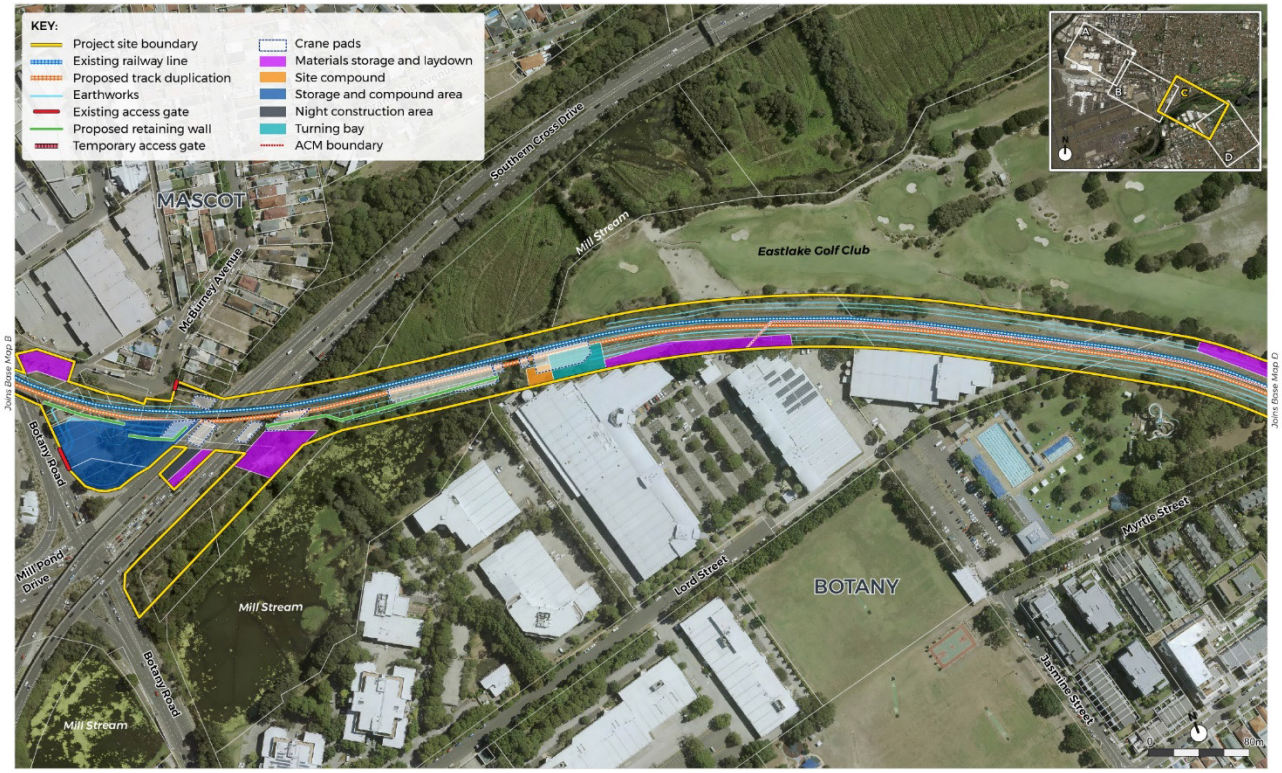


Figure 5.2 Construction zones including proposed temporary crane pads

### 5.1.3 Construction lighting

The Civil Aviation Safety Authority has the power through regulation 94 of the Civil Aviation Regulations 1988 to require lights which may cause confusion, distraction, or glare to pilots in the air, to be extinguished or modified.

Section 9.21 of *Civil Aviation Safety Authority Manual of Standards Part 139 – Aerodromes (CASA)* provides advice regarding lighting systems for use at or in the vicinity of an aerodrome. Lights may cause confusion or distraction by reason of their colour, position, pattern, or intensity of light emission above the horizontal plane within six kilometres of an airport.

The Civil Aviation Safety Authority Manual of Standards Part 139 Figure 9.21-1: Maximum lighting intensities defines zones where glare may cause distraction of pilots and limits the allowed intensity, as shown in Figure 5.3.

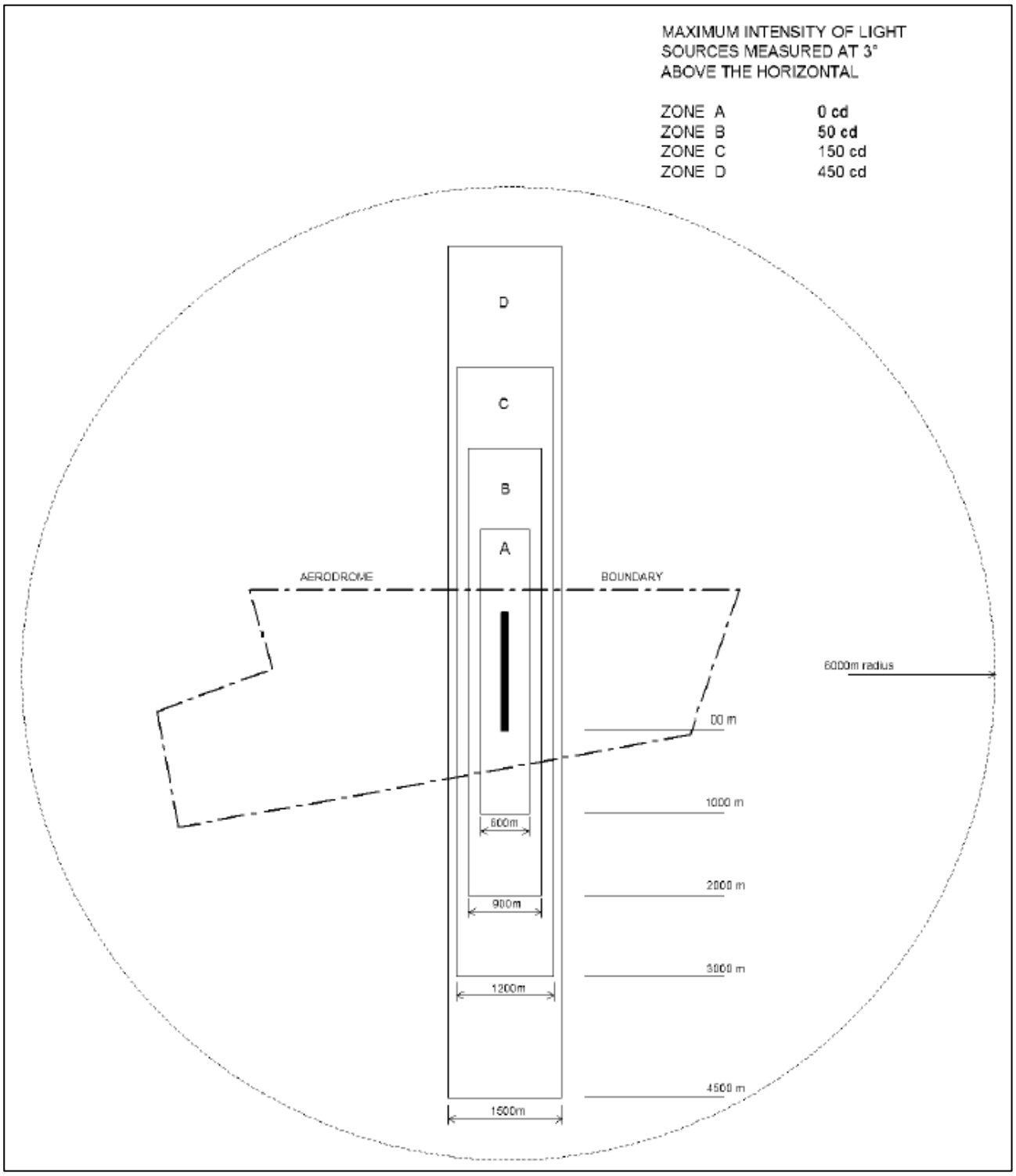


Figure 5.3 Maximum lighting intensities defined by CASA Manual of Standards Part 139, Fig. 9.21-1

The project design has been superimposed onto the maximum light intensity zones prescribed by Manual of Standards Part 139. As shown in Figure 5.4, parts of the project fall within zones A, B, C and D.

In Zone A, the maximum allowable lighting, when measured at 3 degrees above the horizontal, is zero (0) candela. It is noted that street lighting design standards generally include this criteria and it is therefore a common design standard. For example, upwards light spill from streetlights is controlled by *AS/NZS 1158.1.1:2005 Lighting for road and public spaces Vehicular traffic (Category V) lighting – Performance and design requirements* (SAI Global, 2005) and limited to 3%. Adherence to this design standard should be adequate to minimise pilot distraction and should be specified as part of tender documentation for any temporary construction lighting for the project. Any construction lighting to be utilised in Zone A will require appropriate aiming and shielding to prevent such spill. In zones B, C and D the amount of allowable spill rises to 50, 150 and 450 candela respectively.

Flood lighting in the site compounds, which are to operate 24 hours a day, will need to be compliant with the lighting zones and shielded as necessary.

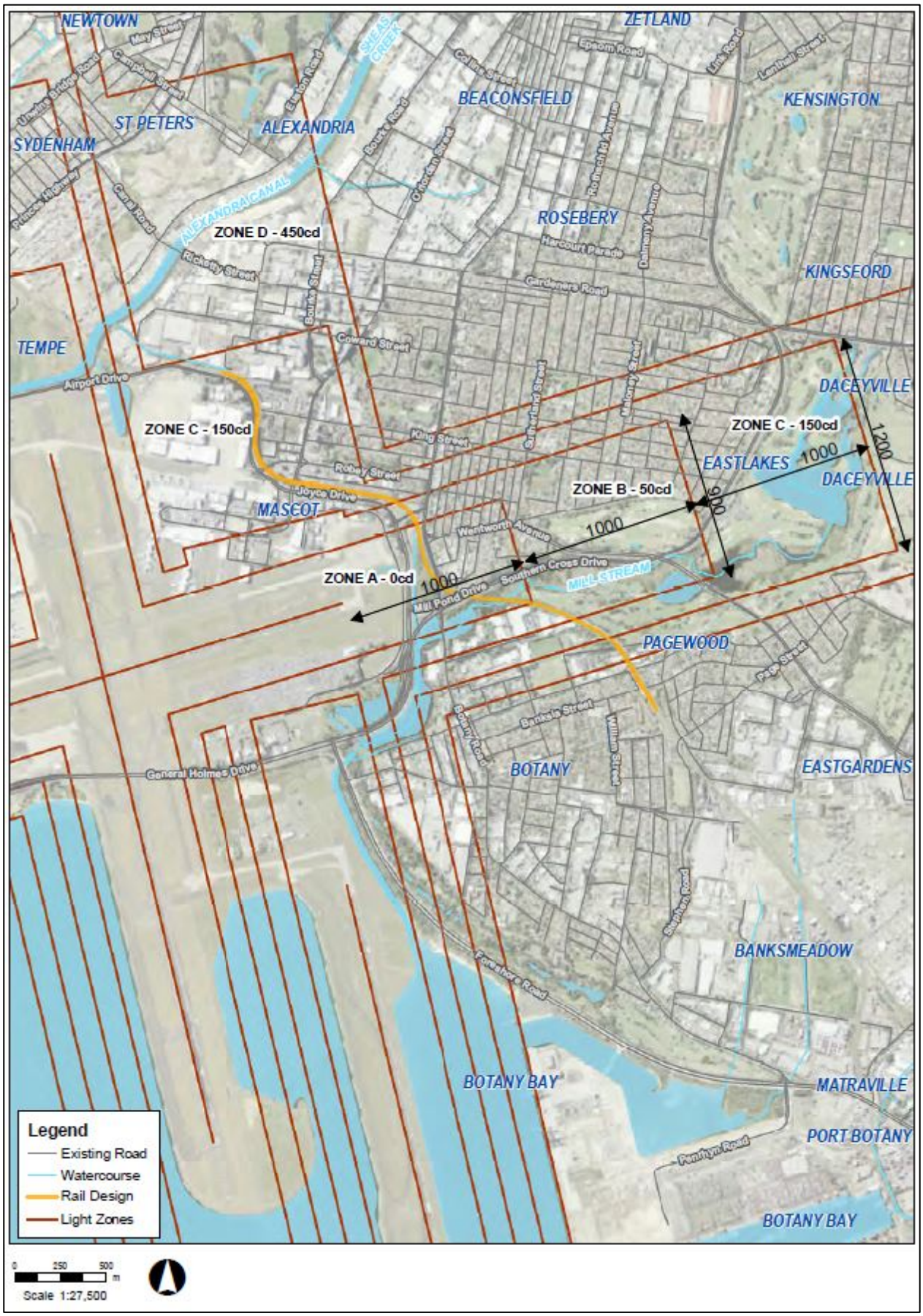


Figure 5.4 Lighting intensities zones

### 5.1.4 Dust production

There is potential for air quality emissions to occur during the construction of the project. The principle activities which may result in emissions include:

- dust and particulate matter emissions from earth working activities
- combustion and toxic pollutant emissions from construction vehicle and plant exhaust.

During construction there is a risk of excessive dust production. *Technical Report 3 – Air Quality Impact Assessment* provides an assessment of the potential source and impact of construction dust based on the construction methodology (provided in EIS Chapter 7). This technical report identified mitigation measures required to minimise dust impacts.

To maintain visibility in the airspace surrounding the airport dust levels need to be kept at a minimal level.

### 5.1.5 Construction noise and vibration

The main potential sources of vibration from the construction works are vibratory rollers and rockbreakers. Impacts are discussed in detail in the *Technical Report 2 – Noise and Vibration Impact Assessment.*

Construction noise and vibration will not have any impact on aviation operations (i.e. flights and aircraft operating on the ground at the airport), however Qantas have advised the flight simulators in the Qantas Flight Training Centre may be affected. This facility is planned to be relocated in 2020 to a new facility at King Street, Mascot. This facility is currently in the planning process and has not been approved. The new facility is proposed 40 metres away from the existing Botany rail line corridor, and could potentially be subject to noise and vibration impacts during construction of the Botany Rail Duplication assuming the facility is operational prior to works commencing. These impacts are discussed in detail in *Technical Report 2 – Noise and Vibration Impact Assessment*.

### 5.1.6 Wildlife strikes

Sydney Airport is a coastal airport which is subject to visitation and transiting by a variety of coastal and inland bird species. There a currently 140 species of birds on the Bird and Animal species database maintained by Sydney Airport Corporation.

Construction operations, including clearing of vegetation along the rail corridor, may lead to temporary accumulation of waste that attracts birds. The construction environment management plan will be required to address and avoid this risk through waste management strategies. General site management practices would also include food waste being correctly stored and regularly removed from site. Provided standard construction practices are maintained the risk of attracting wildlife is minimal.

Temporary site drainage would be required to avoid ponding water that could attract birds.

Provided there is no failure to implement such practices, the risk of attracting wildlife is considered small and manageable.

## 5.2 Impacts during operation

### 5.2.1 Operational impacts overview

Post-construction operation of the Botany Rail Duplication project can have the potential to create further hazards to airport and aircraft operations. Potential impacts include:

- light glare from train headlights distracting or confusing pilots
- train heights, and other rail infrastructure heights infringing the obstacle limitation surface
- maintenance activities infringing the OLS
- bridge structures creating changes in wind turbulence within the airspace
- modifications to drainage and vegetation which may create attractive habitats for wildlife, increasing risk of wildlife strikes or avoidance manoeuvres.

The following National Airports Safeguarding Framework Guidelines apply to the operational impacts of the Botany Rail Duplication project:

- Guideline B – Managing the risk of building generated windshear and turbulence at airports.
- Guideline C – Managing the risk of wildlife strikes in the vicinity of airports.
- Guideline E – Managing the risk of distractions to pilots from lighting in the vicinity of airports.
- Guideline F – Managing the risk of intrusions into the protected operational airspace of airports.

The potential operational impacts are discussed below.

### 5.2.2 Light glare

Light glare from train headlights has the potential to distract or confuse pilots as they are arriving at Sydney Airport. Train headlights are currently used on the existing Botany Line. This section describes these risks.

Section 9.21 of Civil Aviation Safety Authority Manual of Standards Part 139 provides advice regarding lighting systems for use at or in the vicinity of an aerodrome. Lights may cause confusion or distraction by reason of their colour, position, pattern, or intensity of light emission above the horizontal plane. Headlights and any permanent lights installed as part of the project must be assessed in detailed design where they fall within the works areas in zones defined by Civil Aviation Safety Authority Manual of Standards Part 139 Figure 9.21-1: Maximum lighting intensities. This figure is reproduced as Figure 5.3.

Overlaying the maximum light intensity areas onto the project site gives Figure 5.4.

In Figure 5.4, part of the project is shown to fall within zone A. This zone nominates that there can be no light spill above 0 candela measured at 3 degrees above horizontal. As the types of trains that will operate on the new line are the same as the current, and the new track level and gradients are consistent with the existing track, the light sources are consistent with the existing operations.

Furthermore, as the trains will not be running parallel to the runway centreline, the risk of pilot confusion is lessoned.

### 5.2.3 Rail and train heights

The finished height of the rail line would be below the obstacle limitation surface.

Freight trains currently traveling along the existing Botany Line alignment are classified as transient obstacles that protrude through the Runway 25 approach and Runway 07 take-off sections of the obstacle limitation surface. These transient obstacles are currently declared in the Sydney Airport *En Route Supplement Australia* (ERSA) as infringing the obstacle limitation surface by a maximum of 15 feet (4.57 metres) above ground level, with the highest point of the trains as they transit being 56 feet (17.07 metres) above mean sea level. The new rail line is adjacent to, and at similar level as the existing, and therefore trains operating on it will also form transient obstacles. The general arrangement of the tracks is shown in Figure 5.5.

Consultation would occur with Sydney Airport Corporation Limited to address any potential changes to the transient obstacle conditions currently declared. An approval process may then be required involving consultation with CASA and ASA. The information contained in the ERSA may require an update by Airservices Australia and this will need to be assessed during detailed design.

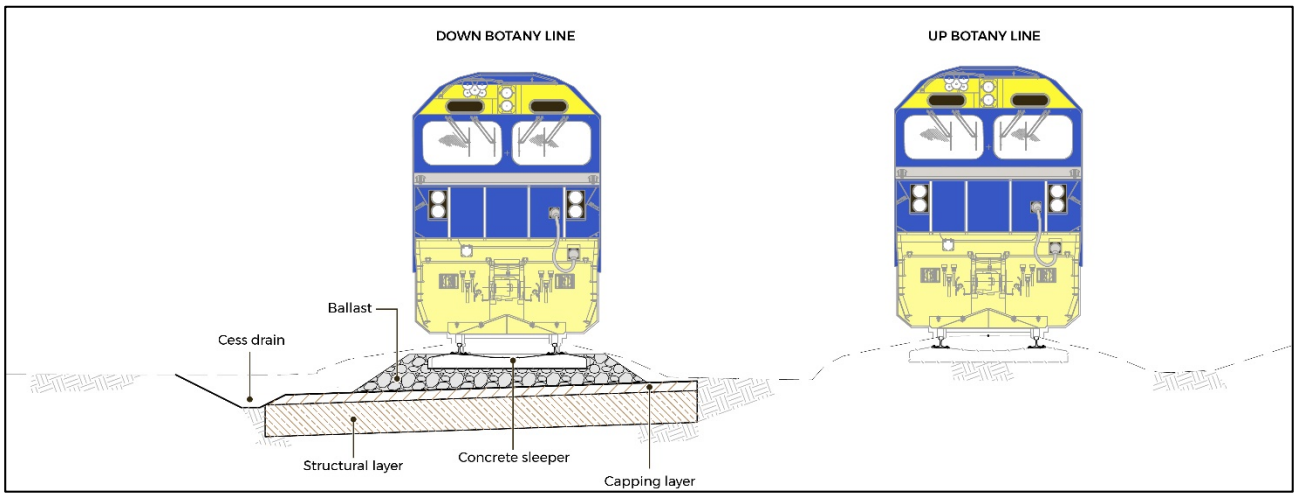


Figure 5.5 Indicative new track formation

### 5.2.4 Operational frequency

Table 5.1 outlines the number of train movements which are proposed in each direction (per day) in the years 2020, 2025 and 2030 after the commissioning of the project. Table 5.1 also outlines the current operational train movements along the Botany Line.

Table 5.1 Expected operational train numbers (per day, per direction)

| Year | Current | 2020 | 2025 | 2030 |
|---|---|---|---|---|
| Train movements | 20 | 32 | 38 | 45 |

A maximum of six trains per hour per direction are proposed at the completion of the project. Trains are expected to run on average every 10 minutes as a maximum in order to meet the above six trains per hour per direction. As the number of trains, and therefore the frequency of transient obstacles will be higher than currently experienced, consultation with Sydney Airport, CASA and Airservices Australia will be required.

### 5.2.5 Maintenance activities

As per the current arrangement, standard ARTC maintenance activities would be undertaken during operations. Typically, these activities include minor maintenance works, such as bridge and culvert inspections, rail grinding and track tamping, through to major maintenance, such as reconditioning of track and topping up of ballast as required.

This would represent no change to the operational maintenance currently undertaken by ARTC for the existing network and therefore no change to current impacts to airport operations is envisaged.

### 5.2.6 Windshear

Turbulence is caused by a disruption to smooth air flow. Turbulence in the lower atmosphere is generally created by the flow of air around an obstacle such as topography or buildings. However, meteorological conditions such as boundaries between different air masses can also result in turbulence.

In accordance with NASF Guideline B, where any developments are proposed in proximity to runways, they should be assessed for potential to create windshear and turbulence that could affect the safety of aircraft. The assessment zones detailed in NASF Guideline B has been overlaid with the project design in Figure 5.6, showing the relation between the zones and the project.

The NASF states the ‘building generated windshear/turbulence issue becomes safety critical when a significant obstacle, such as a building, is located in the path of a crosswind to an operational runway. The wind flow will be diverted around and over the buildings causing the crosswind speed to vary along the runway’.

As there are no significant structures associated with the project, and no significant changes to topography, the windshear or turbulence is not expected to change from the current situation.

The bridge upgrades at Botany Road are limited to minor remediation, with the existing structure being retained. The new two-span rail bridge at Southern Cross Drive, two new single span concrete bridges at Robey Street, two single span structure bridges at O’Riordan Street and new-two span rail bridge over Mill Stream are low level structures and do not warrant further assessment under the NASF as they are below the 1:35 assessment surface.

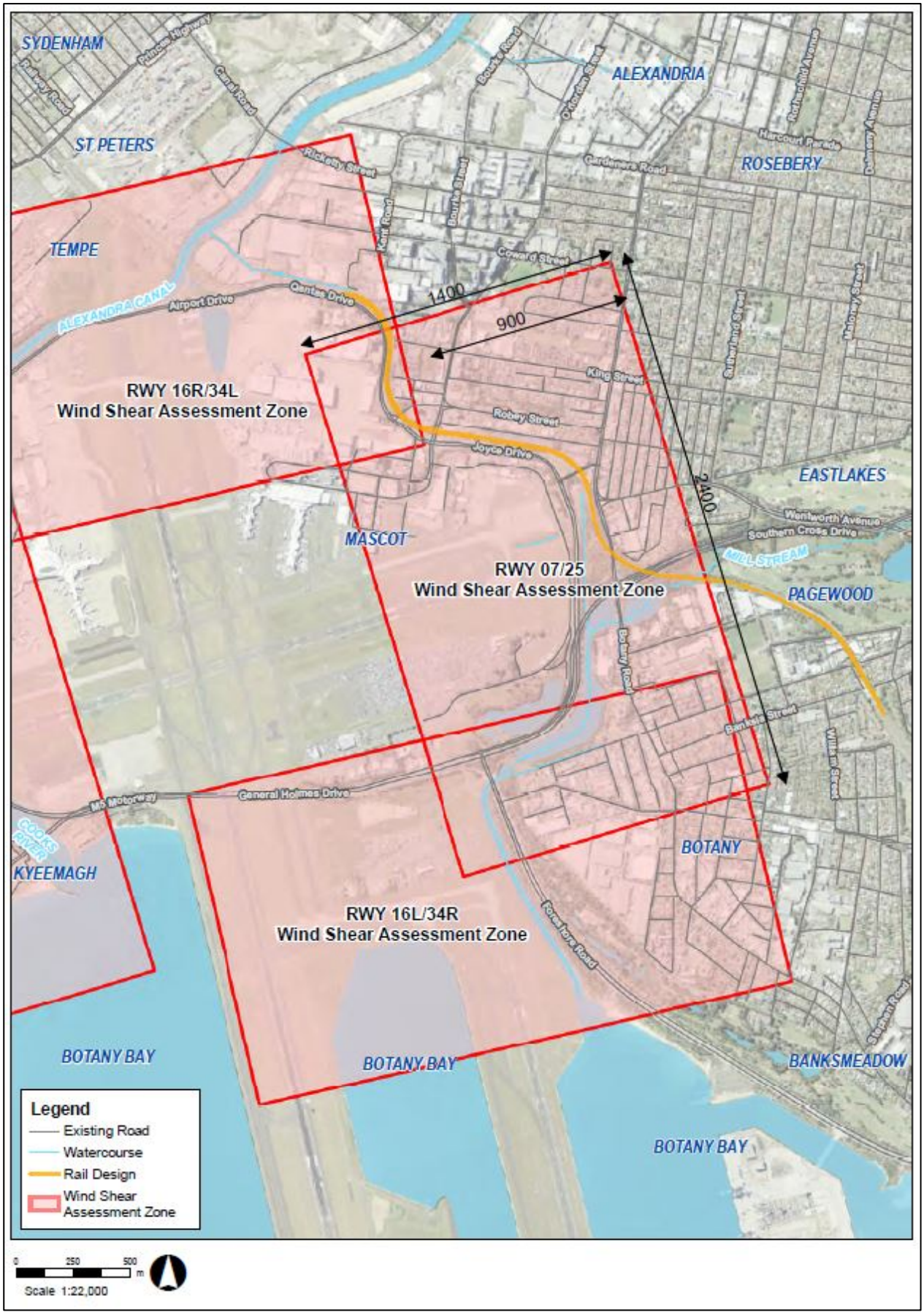


Figure 5.6 Windshear assessment zones for runways 16R/32L, 07/25, and 16L/32R at Sydney Airport

### 5.2.7 Wildlife strikes

Drainage and landscaping within the project site has the ability to attract various wildlife that may not have been present in the area previously. However, the project requires removal of flora rather than any additional planting and any landscaping would generally be limited to revegetation of cleared areas within the existing rail corridor, where reasonable and feasible. As such, it is not anticipated that the project would contribute significant new habitat which would attract additional fauna populations to the area.

Overall, the risk of attracting wildlife during the operational phase of the project is considered negligible.

### 5.2.8 Tower line of sight

The project will not impact on the line of sight of the Air Traffic Control tower to any part of Sydney Airport aircraft movement areas as all works are outside of this area.

### 5.2.9 NASF summary

During the development of the project design, the NASF Framework has been referenced to assess the impacts of the design on the operations of Sydney Airport. The following table summarises the approach to the assessments and outcomes for each of the Guidelines:

Table 5.2 Approach summary to National Airports Safeguarding Framework Guidelines

| Guideline | Approach |
|---|---|
| ▪ Guideline A: Managing Aircraft Noise | ▪ N/A – The project does not require any flight path or aircraft procedure changes so there is no impact to aircraft noise. |
| ▪ Guideline B: Managing Building Generated Windshear and Turbulence | ▪ Parts of the project lie within the windshear assessment zones as defined by the Guideline. The project does not include any significant structures or topography changes, and the windshear or turbulence is not expected to change from the current situation. |
| ▪ Guideline C: Managing Wildlife Strike Risk | ▪ The project does not require and changes to the existing management actions (by SACL).<br>▪ In general, vegetation is being removed along the rail alignment to allow for the duplication of the line. This is likely to reduce the attraction for wildlife.<br>▪ Any landscaping is limited to revegetation of cleared areas which is not anticipated to contribute significant new habitat. |
| ▪ Guideline D: Managing Wind Turbine Risk to Aircraft | ▪ N/A – there are no wind turbines in the project. |
| ▪ Guideline E: Managing Pilot Lighting Distraction | ▪ The project does not change the type of trains operating and therefore the risk of pilot lighting distraction does not change from the existing situation. |
| ▪ Guideline F: Managing Protected Airspace Intrusion | ▪ A 3D model of protected airspace has been received from SACL and checked against the proposed project. Further consultation with Sydney Airport Corporation Limited will be required as the design progresses.<br>▪ The new rail line would be at substantially the same level as the existing, and will be below the protected airspace.<br>▪ Trains will continue to be transient objects infringing the obstacle limitation surface.<br>▪ Train frequency will increase leading to more frequent infringements and consultation will be required with Sydney Airport, CASA and Airservices Australia. |

| Guideline | Approach |
|---|---|
| ■ Guideline G: Communications, Navigation and Surveillance | ■ A review of the detailed design will be undertaken to confirm that no impacts on navigations aids, communications or surveillance equipment would occur.<br>■ NASF Guideline G requirements will be implemented where required. |
| ■ Guideline H: Protecting Strategically Important Helicopter Landing Sites | ■ No strategically important helicopter landing sites have been identified within the project footprint. |
| ■ Guideline I: Managing the Risk in Public Safety Areas at the Ends of Runways | ■ Public safety areas are areas off the ends of runways where there may be elevated risk of aircraft incidents and therefore controls should be applied to developments to minimise risk to public safety.<br>■ The project does not propose any public buildings or congregation areas in the public safety area.<br>■ The project does not propose any transport interchanges in the public safety area. |

## 5.3 Cumulative impacts

The following projects and proposals are in the vicinity of the Botany Rail Duplication:

- Sydney Gateway road project
- Qantas Flight Training Centre
- WestConnex New M5
- WestConnex New M4-M5
- F6 Extension Stage 1
- Airport East
- Airport North.

The Sydney Gateway road project includes the following potential impacts to airport operations, in relation to runway 16R/34L:

- intrusion into prescribed airspace during construction phase
- potential lighting glare during construction, and from vehicle headlights during operation.

Similar to Botany Rail Duplication, these issues are not expected to result in impacts on aviation safety, so long as all legislation and other guidelines are followed, and close liaison with Sydney Airport Corporation Limited and existing permitted processes are followed.

It is not anticipated that the other aforementioned proposals will provide any cumulative impacts with the project with respect to airport operations.

# 6. Management of impacts

This section provides mitigation and management measures to be undertaken during the project.

## 6.1 Approach

As described in the EIS Chapter 6 (Project features and operation) and Chapter 7 (Construction), design development and construction planning has focussed on avoiding and/or minimising the potential for environmental impacts during all key phases of the process. Measures taken to avoid or minimise impacts which relate to airport operations include:

- design in conjunction with the Sydney Airport protected airspace data
- recommendation of construction method statements to be developed in conjunction with legislation, policies and guidelines, in particular the National Airports Safeguarding Framework.

Implementation of mitigation measures mentioned in Table 6.1 should reduce the potential impacts to airport operations at Sydney Airport.

The detailed design, construction and operation of the project will consider the mitigation measure listed in Section 6.2.

Mitigation measures would be managed through the following:

- ARTC's Site environmental management plans (EMPs) for enabling works
- project specific CEMP for main construction works
- community and stakeholder engagement plan
- ARTC's environmental management system for operation of the project.

Through the assessment process there have been no unmitigated impacts identified, with the exception of trains being transient obstacles as per the existing rail alignment. This residual impact will be managed through consultation with Sydney Airport Corporation Limited.

## 6.2 List of mitigation measures

The mitigation measures that would be implemented to address potential airport operations impacts are listed in Table 6.1 and will be incorporated into the relevant management plans.

Table 6.1 Recommended mitigation measures

| Stage | Impact | Recommended mitigation measure |
|---|---|---|
| Design | 5.2.6 Wind shear and turbulence due to new constructions in the vicinity of the airport | Based on the current design, detailed windshear assessment is not warranted.<br>Consultation with Sydney Airport Corporation Limited is required to confirm any need for detailed assessment in accordance with National Airports Safeguarding Framework Guideline B during detailed design. |
| | 5.2.2 Light glare distracting and confusing pilots | Lighting associated with operation and maintenance of the rail line, including train headlights, will comply with CASA MOS 139 section 9.21, and National Airports Safeguarding Framework Guideline E. |
| | 5.2.3 Rail and train heights infringing the obstacle limitation surface | The rail alignment has been designed in conjunction with the protected airspace associated with Sydney Airport to minimise the intrusions into the airspace. It is noted, however, that freight trains travelling along the existing rail alignment are declared transient obstacles, and it is noted that the project will have the same ongoing operational impact.<br>Consultation with Sydney Airport Corporation Limited will be required at detailed design on the final rail alignments and heights.<br>Consultation with Airservices Australia will be required at detailed design for assessment of any required updates to the ERSA. |
| | 5.2.7 Wildlife strikes due to increased wildlife activity in the vicinity of the airport | Drainage and revegetation has been designed so as not to create high risk environments for attracting additional wildlife. Any changes to the drainage or revegetation design made during detailed design will ensure that no high risk environments for attracting additional wildlife are created. |
| Construction | 5.1.2 Construction plant infringing the obstacle limitation surface | Management plans will be developed and implemented for the project to ensure that the necessary approvals are sought, particularly for the use of cranes. Use of cranes will comply with National Airports Safeguarding Framework Guideline F.<br>Where necessary, use of cranes that would infringe the OLS may be limited to curfew hours and/or permits obtained from Sydney Airport. |
| | 5.1.3 Construction lighting producing light spill in the direction of incoming aircraft | Management plans will be developed and implemented for the project to ensure the lights proposed for use comply with CASA MOS 139 section 9.21, and National Airports Safeguarding Framework Guideline E. |
| | 5.1.4 Dust production causing visibility issues in the airspace surrounding the airport | Management plans will be developed and implemented for the project to ensure the construction methods used do not produce excessive amounts of dust. |
| | 5.1.6 Risk of wildlife strikes due to attraction of wildlife to areas near airport operations | Management plans will include measures to minimise waste attracting wildlife, particularly birdlife. These would include, but not be limited to:<br>■ food waste being stored in covered bin<br>■ waste being regularly removed from site. |

# 7. Conclusion

Australian Rail Track Corporation (ARTC) proposes to construct and operate a new second track within the existing Botany Line rail corridor between Mascot and Botany, in the Bayside local government area. The Botany Rail Duplication would increase freight rail capacity to and from Port Botany. The project is located in close proximity to Sydney Airport, with sections located near the Runway 25 threshold.

This Airport Operations report has been prepared to address the project SEARs and the requirements for a Major Development Plan under the *Airports Act 1996*. As stated in SEARs section 12 Hazards and Risks, part 12.2 states "The EIS must outline the impacts to the operation of the airport, including encroachment into the prescribed airspace, potential impacts to airport Communication, Navigation and Surveillance Systems, light spill and landscaping associated with the construction and operation of the project."

Through the assessment process there have been no unmitigated impacts identified, with the exception of trains operating on the new line being transient obstacles, which is as per the existing operations on the existing rail alignment. This impact will require consultation with Sydney Airport Corporation Limited.

Application will be required to Airservices Australia for detailed assessment of potential impacts to Communications, Navigation and Surveillance under NASF Guideline G.

## 7.1 Construction

Management plans will be developed for the project to ensure the plant proposed for use is appropriate for the area near the airport, and that the necessary approvals are sought, particularly for the use of cranes. Use of cranes is to comply with National Airports Safeguarding Framework Guideline F.

Construction lights proposed for use must be appropriate for the area near the airport, and necessary approvals sought. Construction lighting is to comply with CASA MOS 139 section 9.21, and National Airports Safeguarding Framework Guideline E.

Construction methods shall not produce excessive amounts of dust that could reduce visibility for pilots.

For the temporary compounds, consultation with Sydney Airport Corporation Limited is required to gain their consent. Following such consent, approval from the Airport Building Controller (ABC), acting as the delegate to the Secretary of DITCRD, may also be required. Where it is unclear whether an approval is required, project proponents are advised to consult the relevant ABC.

## 7.2 Operational

The operational project will avoid adverse or distracting lighting configuration, spillage or intensity to aircraft operations. Lighting associated with operation of the rail line, including train headlights, must comply with CASA MOS 139 section 9.21, and National Airports Safeguarding Framework Guideline E.

The rail alignment is designed in conjunction with the obstacle limitation surface as provided by Sydney Airport Corporation Limited. The existing rail alignment is situated such that freight trains travelling along the rail line are declared as transient obstacles, protruding through the obstacle limitation surface for short periods of time. It is expected that trains travelling along the rail duplication will create the same transient obstacles. This impact will require consultation with Sydney Airport Corporation Limited.

## 7.3 Cumulative

No cumulative impacts have been identified as part of this study.

# 8. References

Airservices Australia (2019), *Aeronautical Information Package Book, Part 2 – EnRoute*, May 2019.

Australian Transport Safety Bureau (2018), *Aviation Occurrence Statistics – 2008-2017, AR2018-030, 21* December 2018.

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Sydney Airport Corporation Limited (2019), *Sydney Airport Master Plan 2039*, April, 2019.

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