Sydney Airport

SYDNEY AIRPORT
T2/T3 Ground Access Solutions and Hotel

MAJOR DEVELOPMENT PLAN

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CHIEF EXECUTIVE OFFICER'S FOREWORD

Since 2002, Sydney Airport has invested more than $2.4 billion to enhance capacity and build new facilities. Over the next five years, we'll be investing a further $1.2 billion.

We now have a pipeline of projects that will improve and upgrade airport facilities, improve the airport experience for our passengers and further enhance capacity.

First and foremost are our investments to upgrade the journey for the 150,000 people who travel to or from the airport every day.

As part of this process, I am pleased to present Sydney Airport's *T2/T3 Ground Access Solutions and Hotel Major Development Plan* (MDP).

The developments outlined in the MDP will make it easier to travel to and from the airport by car, taxi or public transport. The solutions will also make it easier and safer for cyclists and pedestrians to travel to and within the T2/T3 domestic precinct.

This will benefit airline passengers, airport workers and other airport visitors.

The transformational ground transport solutions outlined in this MDP – which were strongly supported by the community and other stakeholders – will result in a better performing one-way road network through the airport's T2/T3 precinct, improved traffic flow, reduced congestion and better access for public transport.

The projects will also increase the capacity of Sydney Airport by catering for the forecast growth in the number of airline passengers passing through the T2/T3 precinct over the next 20 years and beyond.

These proposals for the T2/T3 precinct complement other planned upgrades to roads in the T1 precinct which are already well underway. Work in the T1 precinct is being carried out over the next three years, including building a new free flowing road network through the precinct, relocating entry and exit gates to reduce traffic queuing, widening roads to increase road capacity and building new flyovers to reduce congestion.

These ground transport solutions will also be complemented by the NSW Government's decision to provide additional bus and train services to and from the airport. Funded jointly with the Australian Government, the NSW Government recently announced investing $282 million to upgrade roads around the airport, as part of the WestConnex enabling works.

Kerrie Mather

Chief Executive Officer

EXECUTIVE SUMMARY

Overview of the proposal

Sydney Airport is one of Australia's most important pieces of infrastructure and is a critical economic engine for Sydney, NSW and Australia. Directly and indirectly, the airport generates and/or facilitates the equivalent of 6 per cent of the state's economic activity and almost 300,000 jobs. The passenger forecasts for the airport presented in the Master Plan 2033 indicate growth from 36.9 million passengers in 2012 to 74.3 million passengers in 2033.

Sydney Airport is proposing the staged construction of Ground Access Solutions in the T2/T3 precinct in the north-east of the airport. These improvements are designed to deliver less traffic congestion, smoother traffic flows and more convenience to drivers, pedestrians and cyclists, increasing the precinct's capacity. The proposal also includes a hotel for improved airline passenger convenience.

The proposed ground access solutions and hotel outlined in this Major Development Plan (MDP) and, consistent with the recently approved Sydney Airport Master Plan 2033 (the Master Plan 2033), were the result of extensive consultation with airlines, the community and other stakeholders, including the NSW Government. The proposed development will enable Sydney Airport, in close consultation with the NSW Government, to increase the airport's capacity by improving road and intersection performance in and around the airport's T2/T3 precinct by 2018 and beyond.

2014

2018

Sydney Airport understands that many travellers to and from the airport experience delays on the road network in and around the airport, particularly during peak times and holiday periods.

Sydney Airport intends to implement these works as a priority commencing in 2015. Commensurate with demand and timed to coordinate with the completion of WestConnex Enabling Works outside of the airport boundary, the major elements of the proposal to be delivered are:

- construction of a new five-lane one-way exit from Shiers Avenue to Qantas Drive at the Robey Street intersection;
- reconfiguration of Sir Reginald Ansett Drive to a one-way entry to the precinct;
- reconfiguration of Ninth Street for easy entry and exit of buses and coaches to the Ground Transport Interchange;
- construction of three additional levels on the P3 car park, a bridge link between P2 and P3 car parks and new lifts for P2 providing a net increase of 350 bays;
- construction of a new parking structure to replace the eastern portion of the P1 car park with a net increase in parking for approximately 1,250 vehicles;
- development of an above ground pedestrian corridor segregated from vehicle traffic from the terminals to P1, P2, P3 and the Ground Transport Interchange with assisted bi-directional walkways in the new P1 East car park resulting in a loss of approximately 100 parking bays;
- construction of a multi-level structure, the Ground Transport Interchange, with a bus and coach pick-up/drop-off facility at ground level and parking/storage for approximately 4,000 vehicles above ground;
- improvements to pedestrian and cyclist paths and intersections within the project area and new end of trip facilities close to the terminal for cyclist;
- provision of additional taxi storage capacity to cater for the increased demand from passengers for this service; and
- construction of a 4 to 5 star hotel with approximately 430 rooms facing Qantas Drive.

This solution will be further enhanced by NSW Government's recently announced reconfiguration of Robey Street and O'Riordan Street (outside the airport boundary) to one-way roads south of the Robey Street /O'Riordan Street intersection.

Implementing the T2/T3 ground access solution as outlined in this MDP will benefit all airport users through better traffic flow in the precinct. When complemented with road network changes already announced by NSW Government, it would also improve the experience of general commuter and Port Botany peak traffic that use the arterial roads surrounding the airport by increasing green light time at the major intersections by up to 33 per cent.

Stakeholder consultation

While preparing the Master Plan 2033, Sydney Airport conducted extensive airline, community and stakeholder consultation and engagement. Overwhelmingly, the feedback on the proposed ground transport solutions from many of the several hundred people who attended one of the community information sessions was positive.

Many of the written submissions received during the draft Master Plan 2033 public exhibition period from a number

of airlines, key aviation, community, government, business and tourism stakeholders were also supportive of the proposed ground transport solutions. In preparing the MDP that was exhibited for public comment, Sydney Airport has had regard to the ground transport-related comments in those submissions.

Sydney Airport public exhibited the pdMDP for 60 business days and had carefully considered and had due regard to all submissions and comments received. The proposed development was subsequently revised and re-exhibited for 15 working days in conjunction with a targeted consultation process involving briefings and communications with relevant stakeholders. Sydney Airport carefully considered and had due regard to all additional submissions and comments received and is now included in this MDP.

Sydney Airport is committed to on-going community and stakeholder engagement during the public exhibition of this plan as well as during the construction phases of the proposed T2/T3 Ground Access Solutions and Hotel.

Traffic and transport assessment

To identify and validate the traffic and transport implications of the proposed development, the ground access works were assessed using demand, micro-simulation and corridor modelling analyses.

Modelling of the proposed development when operational in 2018 demonstrates that a reduction in queues and delays will be achieved when compared with the current operation and the 2018 'do nothing' scenario. Operation at all intersections will be significantly improved resulting in comparatively short delays and queues that clear during most signal phasing cycles. Travel time reliability will be improved for both airport and non-airport road users. In combination with road works by the NSW Government outside the airport boundary, the proposed development will also provide a travel time benefit to Port Botany freight vehicles and general commuters on the wider road network when compared with the 'do nothing' scenario even with a local change in route required.

Environmental assessment

Comprehensive assessment of the proposed development has been undertaken to identify the benefits and impacts in relation to the environment, including ecology, cultural heritage, noise and air quality.

The key environmental benefits of the proposed development include:

- improvements to facilities and connectivity for cyclists and pedestrians;
- encouraging increased use of public transport by providing a high standard Ground Transport Interchange that caters for the additional public bus services to Sydney Airport announced by the NSW Government;
- reducing air and noise impacts associated with traffic congestion by improving the road network in and around the airport;
- reducing greenhouse gas emissions by the installation of a parking guidance system that increases the efficiency of vehicle circulation; and
- incorporation of sustainability measures into the detailed design of the proposed development to improve environmental outcomes including:
  - low emission technologies such as LED lighting;
  - resource efficiency including reuse of existing materials for construction, use of alternative construction materials such as recycled content material; and
  - water recycling such as within the rental car facility wash bay.

Sydney Airport recognises the proposed development identified potential or unavoidable construction and operational environmental impacts. However, through management and mitigation it is considered that the development is not likely to have significant environmental or ecological impacts. The proposed development is consistent with the Sydney Airport Environment Strategy 2013–2018.

Conclusion of the MDP assessment

On the basis of the assessment presented in this MDP, Sydney Airport concludes that the construction and operation of the proposed T2/T3 Ground Access Solutions and Hotel remains:

- fully consistent with the relevant provisions of the Sydney Airport Master Plan 2033;
- not a development of a kind that is likely to have significant environmental or ecological impacts;
- not a development which affects an area identified as environmentally significant in the Sydney Airport Environment Strategy 2013–2018; and
- not a development of a kind that is likely to have a significant negative impact on the local or regional community.

Sydney Airport also considers that the documentation of the proposed T2/T3 Ground Access Solutions and Hotel MDP and consultation with stakeholders would meet the applicable requirements under the NSW planning and development consent process as administered by the Department of Planning, the City of Botany Bay Council and other relevant agencies.

Sydney Airport is pleased with the approval of this MDP so that detailed planning can now commence and the benefits for all airport users outlined in this plan can be achieved as soon as possible.

Chapter 1

Introduction

CHAPTER

1 / INTRODUCTION

THE MAJOR DEVELOPMENT PLAN OUTLINES SYDNEY AIRPORT'S PLAN TO DEVELOP AND OPERATE GROUND ACCESS SOLUTIONS AND A HOTEL IN THE T2/T3 PRECINCT IN ACCORDANCE WITH THE STATUTORY APPROVAL FRAMEWORK.

1.1 Background to the proposed development

Sydney Airport is one of Australia's most important pieces of infrastructure and is a critical economic engine for Sydney, NSW and Australia. Directly and indirectly, the airport generates and/or facilitates the equivalent of 6 per cent of NSW's economic activity and almost 300,000 jobs[1].

The airport is conveniently located 8km from central Sydney. This strategic location gives Sydney and NSW a unique advantage when attracting international business and tourism markets to Australia.

The airport serves international, domestic and regional passenger and freight airlines, general and business aviation, and charter and helicopter operations. As Sydney and Australia's primary international aviation gateway, on a current annual basis[2] the airport facilitates:

1. Sydney Airport 2014a, p33
2. The baseline year of 2012 is used in the MDP to be consistent with the aviation forecasting and traffic modelling for the Master Plan 2033 that were based on 2012 data

- 34 international, 6 domestic and 6 regional airlines[3];
- flights to 47 international, 24 domestic and 26 regional destinations[4];
- approximately 42 per cent of Australia's international air traffic and 22 per cent of domestic and regional air traffic[5]; and
- almost 50 per cent of Australia's international air freight, 80 per cent of which is carried within the cargo holds of passenger aircraft[6].

Additionally, from 2000 to 2012, total annual passengers through the airport increased from 25.2 million to 36.9 million. This represents an annual average growth rate of 3.4 per cent[7].

The aviation industry is continually evolving with new airline entrants, route expansion, improved technology and enhanced customer experiences. As presented in the Sydney Airport Master Plan 2033 (the Master Plan 2033)[8], which was approved on 17 February 2014, as part of its long-term planning for the next 20 years and beyond, the airport needs to be flexible and responsive to continuing industry and technological changes.

The Master Plan 2033 presents an integrated plan of aviation activity, land use, ground access, commercial development and environmental management – including the staged development of two integrated terminal precincts T1 and T2/T3, each catering for international, domestic and regional services.

Investment in the airport of over $2 billion since 2002 has increased service levels, enhanced safety and security, delivered environmental improvements and increased capacity to meet demand. Continued investment will ensure the airport will be able to connect Sydney – Australia's largest global city – to other global cities as well as many parts of Australia and regional NSW.

Airports everywhere face significant challenges and impacts that require appropriate management and mitigation where possible. Sydney Airport will continue to invest in operational and environmental initiatives focused on sustainable growth to address forecast demand.

1.2 Sydney Airport's objectives for the proposed development

Consistent with Sydney Airport's objectives in the Master Plan 2033 and its overall vision 'to deliver a world-class airport experience and foster the growth of the airport for the benefit of Sydney, NSW and Australia', Sydney Airport's objectives for the proposed T2/T3 Ground Access Solutions and Hotel are:

- increase the capacity of the airport to cater for the increasing forecasted growth in passengers;
- to improve the level of service and safety for:
  - public transport and road users travelling to and from the airport by developing a one-way roadway system within and beyond the T2/T3 precinct;
  - pedestrians and cyclists by providing appropriate pathways and corridors into and through the precinct;
  - vehicles accessing and using the T2/T3 parking facilities;
  - general commuter and Port Botany peak traffic that use the roads surrounding the airport; and
  - nearby sections of the arterial road network operated by the RMS directly serving the T2/T3 precinct;
- encourage the use of public transport by providing a Ground Transport Interchange that caters for the additional public bus services to the airport that have been announced by the NSW Government;
- encourage bicycle use through the provision of shared pathways and end of trip facilities near the terminals;
- increase parking provision for airport users;
- improve the pedestrian experience and convenience between the Ground Transport Interchange, the car parks and the terminals; and
- improve the T2/T3 precinct passenger convenience by providing a hotel with associated services.

1.3 Overview of the proposed development

The proposed development described and assessed in this Major Development Plan (MDP) – the T2/T3 Ground Access Solutions and Hotel – will enable Sydney Airport, in close collaboration with the NSW Government, to improve road and intersection performance in and around the airport's T2/T3 precinct by 2018 and beyond. It is consistent with the

3 Sydney Airport 2014a, p32
4 loc cit
5 BITRE 2013a, p27; BITRE 2013b, p11
6 Sydney Airport 2014a, p102
7 Sydney Airport 2014a, p53
8 Sydney Airport 2014a

Master Plan 2033 that provides strategic guidance for the airport's development over the 20 year period to 2033.

The proposed road system reconfiguration will also facilitate the proposed development of a 4 to 5 star hotel of approximately 430 rooms on a site bounded by Seventh Street, Qantas Drive, Ninth Street and the northern side of the proposed Ground Transport Interchange.

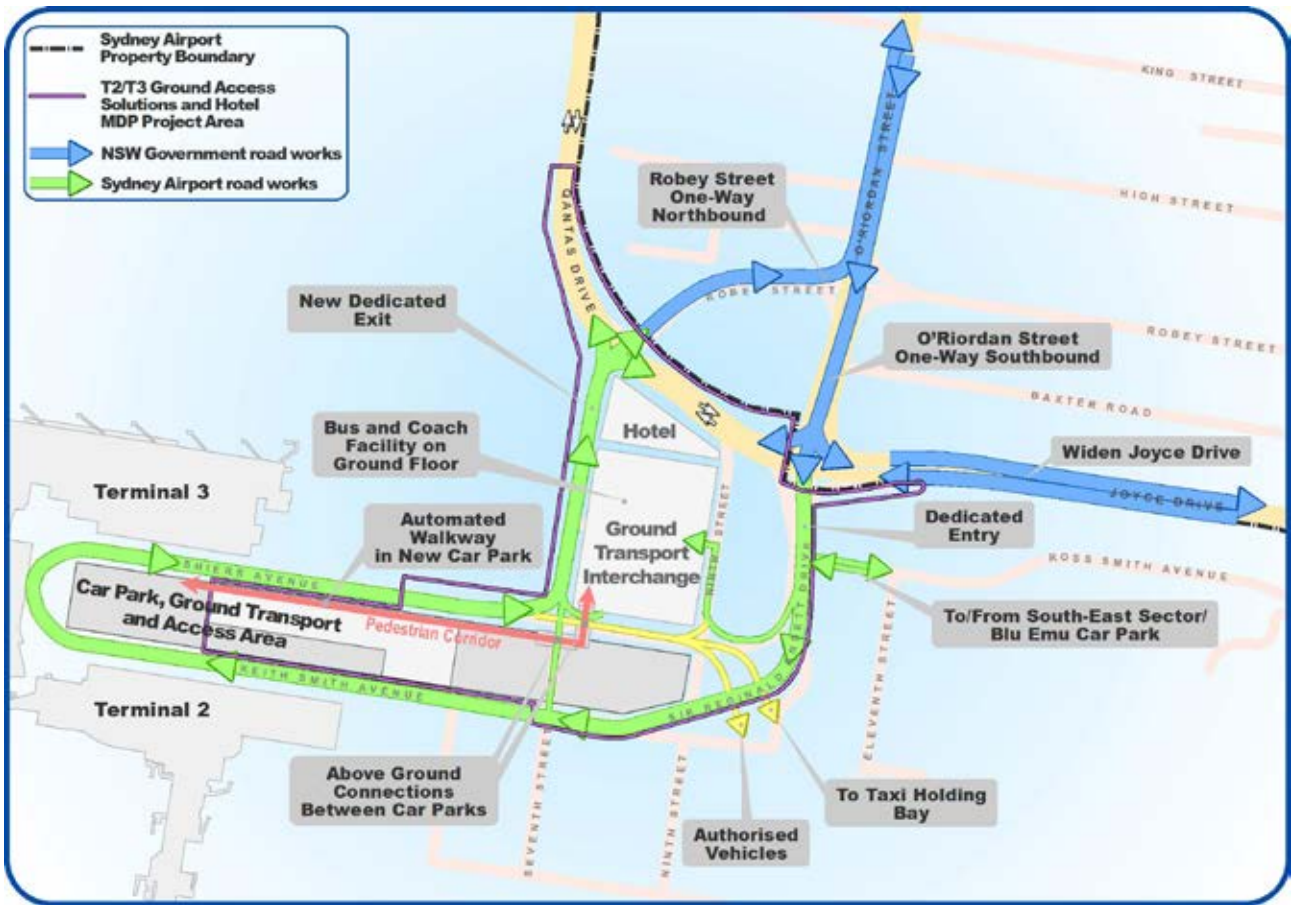
Sydney Airport has prepared a Five Year Ground Transport Plan[9] designed to improve the performance of roads and intersections in and around the airport which cater for movements to and from the T2/T3 precinct, as well as allow for additional public transport facilities.

To address forecast demand and future road congestion issues generated by the high levels of non-airport traffic using the intersection at the entrance to the T2/T3 precinct, road solutions are required that involve works both within and beyond the airport's boundary. Once the works are completed, ground traffic modelling predicts that forecast airport-related traffic demand can be met in 2018 and beyond.

In summary and as shown in **Figure 1.1**, the proposed ground access improvements addressed in this MDP (and described in detail in Chapter 4) are:

- development of a one-way road system within the T2/T3 precinct by:
  - constructing a new road connecting Shiers Avenue to Qantas Drive (the extension of Seventh Avenue) through the current Southern Hangar Line adjacent to the Jet Base to link with a reconfigured intersection and a recommended change of direction for the south-western section of Robey Street to one-way northbound; and
  - reconfiguration of Sir Reginald Ansett Drive to provide one-way entry southbound to the precinct from Joyce Drive, Qantas Drive and a recommended one-way southbound reconfiguration of O'Riordan Street south of the Robey Street intersection;
- widening of Qantas Drive between Robey Street and O'Riordan Street to three lanes in both directions and associated turning lanes;
- other localised changes to the T2/T3 precinct roadway system;

Figure 1.1 Access strategy and proposed infrastructure for T2/T3 precinct



Source: AECOM

9 In accordance with section 71(2) (ga) of the *Airports Act 1996*.

- construction of three additional floors on the P3 parking structure and a bridge link to the P2 parking structure to provide a net increase of approximately 350 bays and pedestrian/vehicle connectivity;
- construction of a new parking structure to replace the eastern structure of P1 with a net increase in parking for approximately 1,250 vehicles including an above ground pedestrian corridor with assisted bi-directional walkways;
- development of a multi-level Ground Transport Interchange to the east of the Seventh Street extension that includes:
  - a bus and coach facility at ground level that accommodates public buses, including the recently introduced double decker public buses;
  - multi-modal parking and storage in the upper levels for approximately 4,000 vehicles;
  - access to and exit from the new one-way road system and Ninth Street; and
  - a quick turnaround (QTA) facility for rental cars.
- development of a dedicated pedestrian path through P2 and P3 to the Ground Transport Interchange resulting in a loss of approximately 100 bays; and
- development of a 4 to 5 star hotel of approximately 430 rooms on a site bounded by Seventh Street extension, Qantas Drive, Ninth Street and the northern side of the proposed Ground Transport Interchange.

Sydney Airport has consulted with Transport for New South Wales (TfNSW) and NSW Roads and Maritime Services (RMS) in preparing and considering ground access options. As presented in Chapter 5, the preferred solution will be complemented by the widening of Joyce Drive as well as the reconfiguration of the southern sections of Robey Street and O'Riordan Street (south of the Robey Street/O'Riordan Street intersection) – both beyond the airport boundary – into one-way roads northbound and southbound respectively to complement the roadworks within the airport boundary. It is noted that these off-airport complementary works do not form part of this MDP but have been referenced for completeness.

The additional road and intersection capacity provided by the proposed one-way road systems (inside and outside the airport boundary) will support higher traffic throughput within the T2/T3 precinct. This arrangement will enable green light time to be increased by 33 per cent to improve traffic flow substantially and reduce congestion.

Transport modelling presented in this MDP (see Chapter 7) demonstrates that the proposed configuration will be able to accommodate forecast ground traffic volumes for the T2/T3 precinct for 2018 and beyond at an improved level of service compared with the current road configuration.

1.4 Proponent details

The proponent for the proposed development described and assessed in this MDP is Sydney Airport Corporation Limited (Sydney Airport), the airport-lessee company that operates the airport.

1.5 The Major Development Plan process and other approvals

The proposed T2/T3 Ground Access Solutions and Hotel are subject to approvals under the *Airports Act 1996* and the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) as summarised in the following sections and discussed in detail in Chapter 10.

1.5.1 Approvals under the *Airports Act 1996*

Land use and development on leased airports on Commonwealth land is regulated by the *Airports Act 1996* and related regulations. Section 89 of the *Airports Act 1996* specifies what constitutes a major airport development. A major development plan (MDP) approved by the Minister for Infrastructure and Regional Development is required before a major airport development can be undertaken at a leased airport.

Preparation of an MDP is required for major airport developments under the following trigger categories:

- development type – including constructing a new road or new vehicular access facility or extending a road or vehicular access facility where:
  - the construction or extension significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and
  - the cost of construction exceeds $20 million or such higher amount as is prescribed.
- development of a kind that is likely to have significant environmental or ecological impact;
- development which affects an area identified as environmentally significant in the airport's environment strategy;
- development of a kind that is likely to have significant impact on the local or regional community;
- a 'sensitive' development approved by the Minister; and
- consecutive or concurrent developments.

The proposed T2/T3 Ground Access Solutions and Hotel will extend existing roads and result in increased capacity for ground transport and includes the development of non-terminal buildings – involving construction costs of over $20 million. As a result, the proposed development constitutes a major airport development. A major airport development can only be undertaken once an MDP is approved by the Minister pursuant to Section 94 of the *Airports Act 1996*.

1.5.2 Other approvals under the *Airports Act 1996*

Construction of the proposed T2/T3 Ground Access Solutions and Hotel is also subject to:

- Sydney Airport's development application and consent application processes to satisfy the requirements of the *Airports Act 1996*, including stakeholder consultation and planning and infrastructure issues; and
- the submission of an application for a building permit to the Airport Building Controller (ABC) in accordance with the *Airports (Building Control) Regulations 1996* pursuant to the *Airports Act 1996*. The Sydney Airport consent application must comply with the conditions of the development approval.

1.5.3 Other Commonwealth approvals

Sydney Airport is required to comply with the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* which, among other matters, covers environmental impact assessment of proposed projects on matters of national environmental significance and on Commonwealth land. As discussed in Chapter 10, the proposed T2/T3 Ground Access Solutions and Hotel will not affect any matters of national significance but, as the airport is located on Commonwealth land, the proposed development needs to be considered in relation to the provisions of the *EPBC Act*.

1.6 Structure of this MDP

This MDP is structured as follows:

PART A PROJECT CONTEXT AND DESCRIPTION

Chapter 1 provides information on the background to the proposed development and the approvals process

Chapter 2 discusses the need for the proposed development and options considered for elements of the proposed works

Chapter 3 describes the community and stakeholder engagement process including the opportunities for feedback and consultation

Chapter 4 describes the proposed Ground Access Solutions and Hotel in the T2/T3 precinct in terms of the design of each element, sustainability issues, infrastructure issues, construction issues, project timing and estimated costs

Chapter 5 discusses the range of off-airport works to be considered by NSW Government agencies that will complement the ground access solutions to be implemented in the T2/T3 precinct

PART B TRANSPORT AND ENVIRONMENTAL ASSESSMENT

Chapter 6 describes the approach to assessment of the proposed development, the sources of information used, and the immediate and regional environment

Chapter 7 presents an assessment of the likely transport impacts and measures for management of these impacts during the construction and operation of the proposed T2/T3 Ground Access Solutions and Hotel

Chapter 8 presents an assessment of the likely environmental impacts and measures for management of any adverse impacts during the construction and operation of the proposed T2/T3 Ground Access Solutions and Hotel

Chapter 9 presents an assessment of the likely economic and community impacts and measures for management of any adverse impacts during the construction and operation of the proposed T2/T3 Ground Access Solutions and Hotel

PART C STATUTORY FRAMEWORK

Chapter 10 documents the statutory framework and the compliance of the proposed development with relevant statutory and policy requirements. It also addresses the approvals requirements if this proposal were to be considered under the NSW planning and development consent regime

Appendices Including consistency of the MDP with Section 91, abbreviations, glossary and references.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Chapter 2

Need for the Proposed Development and Options Considered

CHAPTER

2 / NEED FOR THE PROPOSED DEVELOPMENT AND OPTIONS CONSIDERED

KEY POINTS

- Sydney Airport is one of Australia's most important pieces of infrastructure. Directly and indirectly, it generates and facilitates:
  - Economic activity equivalent to 6 per cent of the NSW economy; and
  - Almost 300,000 jobs.
- The continued growth of Sydney Airport is vital to achieving local and state based employment, tourism and development objectives.
- Sydney Airport's location offers strategic and commercial advantages to Sydney and NSW:
  - 2km to Port Botany;
  - 8km to the CBD; and
  - Under 10km to the harbour and several major tourist beaches.
- Sydney Airport provides Sydney, NSW and Australia with an unmatched network of intrastate, interstate and international routes:
  - 47 international, 24 domestic and 26 regional routes; and
  - 34 international, 6 domestic and 6 regional airlines.
- Major intersections at the airport are experiencing peak hour congestion and traffic modelling demonstrates that the performance of the road network continues to decline if not addressed.
- Improving ground transport access to Sydney Airport is a priority to make it easier for airline passengers, airport workers and other airport visitors to travel to and from the airport by car, taxi or public transport.
- The ground access solution presented in this MDP would increase green-light time at the major intersections by up to 33 per cent, reduce conflict between entering and departing traffic in the T2/T3 precinct and provide additional capacity for vehicle movements and storage in 2018 and beyond.
- To separate pedestrians from ground level traffic, a new elevated, weather protected pedestrian corridor with moving walkways in new built sections is proposed to connect the Ground Transport Interchange and car park with the terminals.
- It is proposed to construct a conveniently located 4 to 5 star hotel within the T2/T3 precinct to meet the demand from airline passengers.

THE NEED TO IMPROVE GROUND ACCESS TO AND FROM SYDNEY AIRPORT WAS CLEARLY IDENTIFIED DURING CONSULTATION FOR THE MASTER PLAN 2033. IMPROVEMENTS WILL ALLEVIATE EXISTING CONGESTION AND INCREASE CAPACITY TO CATER FOR FORECAST GROWTH IN PASSENGERS.

Sydney Airport has carefully considered a range of ground access options for the T2/T3 precinct that will best meet the current and future needs of passengers, airlines and other stakeholders, and contribute to improvements in sustainability. The proposal detailed in this MDP is the optimal option to deliver a superior ground access solution for the long term.

2.1 The master planning context for the proposed development

The airport planning context for developments in the T2/T3 precinct area is provided through the Master Plan 2033 which addresses a 20 year planning horizon for the airport overall and includes a Five Year Ground Transport Plan which meets the requirements of Section 71 (2) (ga) of the *Airports Act 1996*.

The passenger forecasts for the airport presented in the Master Plan 2033 indicate growth from 36.9 million passengers in 2012 to 74.3 million passengers in 2033. This represents an annual compound average growth rate for all passengers of 3.4 per cent[10].

To provide capacity for this forecast growth and to provide an enhanced passenger experience, the development plan for the airport is presented in the Master Plan 2033. This development plan is designed to ensure the airport can facilitate the growth of tourism and trade well beyond the 2033 horizon of the Master Plan 2033. Key aspects of the development plan directly relevant to the T2/T3 precinct include:

- implementing a number of road traffic improvement projects; and
- creating transport interchanges, well located to the terminal precincts, to facilitate fast affordable and reliable access to multiple transport options[11].

In Chapter 7 and Appendix A of the Master Plan 2033, ground transport solutions are identified that are designed to improve the performance of the roads and intersections in and around the airport. During the Master Plan 2033 consultation period in 2013, Sydney Airport's ground access proposals were supported by stakeholders including airlines, peak transport and logistics groups (such as the NRMA and the Australian Logistics Council)[12], business groups (such as the Sydney Business Chamber) and tourism and travel groups (such as the Tourism and Transport Forum Australia)[13].

For these proposed solutions to function at an optimal level, work will be required both inside the airport boundary (as described in this MDP) and outside the airport boundary (as described in Chapter 5). Details of the works for the T2/T3 precinct within both the 20 year planning horizon and the first five year period are given, which are the basis of the proposed Ground Access Solutions and Hotel addressed in this MDP.

In relation to commercial development in the north-east precinct, the Master Plan 2033 states:

In the period to 2018, a new Seventh Street multi-storey car park and new public transport facility with access from an extended Robey Street may be required as proposed ground transport improvements discussed in Chapter 7 [of the Master Plan] are progressed. It is also possible that a hotel or hotels of approximately 300 to 500 rooms could be developed in the precinct[14].

The Master Plan 2033 also provides an indicative staging and an implementation framework for the development plan. In the first five year period of the 20 year planning horizon, the Master Plan 2033 anticipates that ground transport projects and works including the following may commence:

- staged development of T2/T3 precinct road augmentation and ground transport works, including reconfiguration and widening of existing roads and development of new roads and intersections and entries/exits to the precinct

10 Sydney Airport 2014a, p50

11 Sydney Airport 2014a, p62

12 NRMA News Release 5 June 2013; Australian Logistics Council, 5 June 2013

13 Sydney Business Council, Media Release, 5 June 2013; TTF Australia, Media Release, 5 June 2013

14 Sydney Airport 2014a, pp118-119

15 Sydney Airport 2014a, p203

- public bus facilities and additional multi-storey car parking capacity within the T2/T3 precinct[15].

The Master Plan 2033 also provides an environmental management framework within which any impacts of proposed developments will be managed and mitigated. In relation to potential heritage impacts in particular, the Master Plan 2033 also notes:

Master Plan proposals, particularly within the north-east sector, will have substantial adverse impacts on airport elements with heritage value. Staged removal of the Qantas Jet Base, the Wimbles Ink factory and other structures such as Hangar 3 and Hangar 13 are required to facilitate growth of the airport to meet the needs of passengers and airlines.

Potential heritage impacts have been identified through the development of a heritage impact assessment (HIA). The HIA also identifies mitigation strategies that will reduce the impacts to heritage values[16].

As a result of the proposed development over the 20 year planning horizon, the passenger experience at the airport will be substantially improved through capacity increases in ground transport, terminal and passenger processing facilities. In particular, passengers transferring between international and domestic or regional flights will benefit from improved connectivity by the reduction of inter-precinct transfers.

Significant improvements will be required to road traffic flows in and around both terminal precincts[17] to facilitate and complement the reconfiguration and expansion of the terminal facilities. This MDP presents the proposed ground access improvements for the T2/T3 precinct.

Modelling for the existing situation demonstrates how the road network 'currently' operates, drawing on modelling for the Master Plan 2033 for the 2012 base year[18]. For this MDP, further modelling has been undertaken for a 2018 'do nothing' scenario which demonstrates how the network would operate in the future without any improvement works (see Section 7.3.2). This modelling found that, without improvements, a number of intersections would operate with levels of service E or F (where F is the poorest possible rating). The intersections of O'Riordan Street and Robey Street and Joyce Drive and O'Riordan Street (both outside the airport boundary) would be among the worst performing in the immediate surrounding road network. Due to these future poor operating conditions, it is likely that drivers would change their travel behaviour to avoid this congestion by using suburban streets as an alternative route and, as a result, travel time reliability would likely decrease though the corridor.

16 Sydney Airport 2014a, p168

17 The ground access improvements proposed in the T1 precinct are presented and assessed in *T1 Ground Access Improvements – Review of Environmental Factors (Sydney Airport 2013)*.

2.2 T2/T3 planning context

The development of options for the proposed T2/T3 ground access improvements during the preparation of the Master Plan 2033 were influenced and informed by a range of planning and design considerations including:

- access to terminals;
- multi-modal landside access requirements;
- links to the arterial road network beyond the airport boundary;
- infrastructure facilities and networks within the T2/T3 precinct;
- airport operational requirements;
- pedestrian and cycle access;
- feedback from customers and stakeholders including airlines;
- the local environment; and
- proximity of airport related commercial facilities to terminals.

These matters are discussed in the following sections.

2.2.1 Landside access requirements

T2 and T3 in particular and the north-east precinct more generally at the airport currently serve passengers – 24.6 million in 2012[19], general aviation, air freight and maintenance activites. This results in a complex ground transport task in a relatively constrained land area.

Ground transport activity in and around the T2/T3 precinct includes:

- traffic providing access to terminals for passengers – taxis, rental cars, limousines, mini-buses, coaches and private vehicles;
- public buses;
- train services on the City Rail network accessed at the underground Domestic station linked to T2 and T3;
- airport-based workforce traffic including cars, motorcycles, cyclists and pedestrians;
- other bicycle and pedestrian movements; and
- delivery and service traffic supporting the operation of the two terminals and the businesses within them and elsewhere in the landside area, including air freight depots, general aviation operators and maintenance activities.

The landside access arrangements in the T2/T3 precinct need to have sufficient capacity to accommodate all the abovementioned vehicle, bicycle and pedestrian movements and to safely and efficiently meet forecast growth in passenger numbers and in the peak demands associated with airline schedules and special events.

18 Sydney Airport 2014a, p97

19 Sydney Airport 2014a, p49

2.2.2 Links to the arterial road network

The landside road network in the T2/T3 precinct links to the RMS arterial road network primarily through the gateway to the T2/T3 precinct at the four way intersection of Sir Reginal Ansett Drive, Qantas Drive, O'Riordan Street and Joyce Drive. Secondary links to this precinct from the arterial road network are provided by:

- left in/left out turns at the intersection of Ninth Street with Qantas Drive; and
- via Ross Smith Avenue:
  - through the general aviation area to the intersection of General Holmes Drive and Joyce Drive; and
  - further southwards via left in/left out turns at the junction of Butler Road and the northbound carriageway of General Holmes Drive.

The arterial road network beyond the airport boundary consists of:

- O'Riordan Street (to the north of Qantas Drive/Joyce Drive), which provides access to the inner suburbs between the airport and central Sydney as well as central Sydney itself, the northern suburbs and heavy vehicle access to the M4 Western Motorway;
- Joyce Drive (to the east of Sir Reginald Ansett Drive and O'Riordan Street), which provides access to Botany Road and General Holmes Drive and then northwards along Wentworth Avenue and the Eastern Distributor to central Sydney, the northern suburbs and the eastern suburbs or southwards to Port Botany, the M5 Motorway and the southern and south-western suburbs; and
- Qantas Drive/Airport Drive[20] (to the west of O'Riordan Street) which runs inside the northern boundary of the airport and provides access to the T1 precinct and beyond via Marsh Street to the M5 Motorway and Sydney's southern and south-western suburbs – in particular for heavy vehicles.

Studies have concluded that commuter and Port Botany heavy vehicle traffic are also major users of the roads surrounding the airport[21].

2.2.3 Affected Infrastructure

There is a range of existing physical infrastructure located in the landside area of the T2/T3 precinct which may be affected by or will influence the detailed design and construction of the proposed Ground Access Solutions and Hotel. This infrastructure includes:

- road infrastructure – at-grade and elevated roadways (Keith Smith Avenue and Shiers Avenue) serving T2/T3, street lighting, traffic signals and drainage;
- the existing centrally located multi-storey car parking structures to the west of Seventh Street known as P1 and P2 and the recently completed Seventh Street car parking structure known as P3;
- the Unigas facility used for taxi refuelling located adjacent to the south-east corner of P3;
- the rental car storage and quick turnaround (QTA) facility immediately north of P3;
- other installations such as the pump house and water tanks, the Airport Link rail tunnel (which passes under the project area) and above ground ventilation and access facilities to the underground station; and
- other services – water, sewer, electricity, gas and telecom/fibre optic cables.

2.2.4 Airport operational requirements

Building heights in the T2/T3 precinct are determined by application of the Obstacle Limitation Surface (OLS), which has been defined for the airport. The site for the proposed development has a height limit of approximately 44 metres Australian Height Datum (AHD) at the northern end, 38 metres AHD at the southern end and 46 metres AHD at the western end.

No airport navigational aids are located in this T2/T3 precinct landside project area.

2.2.5 Pedestrian and cycle access

Pedestrian and bicycle movements to and through the project area are currently catered for within the existing road reservations. Pedestrian paths exist on some roadways and bicycle movements are accommodated within the traffic lanes of the roadways. There are centrally located bicycle storage facilities within the existing T2/T3 precinct.

2.2.6 Local environment

The local environment of the project area is generally flat land, highly modified and characterised by extensive existing aviation-related development of quasi-industrial style large-scale buildings. This development is set within remnants of the grid street layout that derives from the historic Lauriston Park residential estate that pre-dated aviation development in this area in the 1910s.

Street tree planting of both native and exotic species visually defines this street layout. There is little other vegetation.

The interface between the airside and landside areas within the project area is defined by the Southern Hangar Line adjacent to the Jet Base consisting of three buildings– Hangars 58 and 85 and the Workshop and Storehouse (Building 84) and the Ninth Street substation located on the west side of Ninth Street.

20 Qantas Drive and Airport Drive are located on Sydney Airport land but form part of the RMS arterial road network.

21 Australian Government and New South Wales Government, 2013

2.3 Description and evaluation of options

2.3.1 Development of ground transport options

In developing and evaluating options for the ground transport arrangements during the preparation of the Master Plan 2033, Sydney Airport first considered if forecast passenger numbers could be accommodated by either the 'do nothing' option or by improvements only to public transport services to the airport. As neither of these options would accommodate forecast passenger numbers, Sydney Airport then formulated and evaluated a number of road-based options.

For each principal element in the road-based arrangements that serve the T2/T3 precinct, options were formulated and evaluated to develop the proposal that is described and assessed in this MDP. Opportunities for airport-related commercial development to enhance the passenger experience in this precinct were concurrently considered and evaluated.

The following aspects were considered in the evaluation of options for ground access improvements in the T2/T3 precinct:

- the need for and ability to cater for the forecast passengers that will use the T2/T3 precinct over the planning period, including feedback from the airlines;
- future integration with any complementary off-airport road investment by the NSW Government linking to the above intersection and elsewhere in the immediate vicinity of the airport;
- recognition of the capacity issues experienced at the current entrance and exit to the T2/T3 precinct at the intersection of Sir Reginald Ansett Drive, Qantas Drive, O'Riordan Street and Joyce Drive, which is heavily used by both airport and non-airport traffic;
- the ability to stage the construction of the proposed works in a manner that will allow continued functioning of the T2/T3 precinct; and
- optimisation of the existing landside road and parking infrastructure in the precinct – the largely one way system west of Seventh Street.

2.3.2 The 'do nothing' option

The 'do nothing' option would involve no improvement of the ground access arrangements in the landside area of the T2/T3 precinct in the nominated project area.

An advantage of this option would be that no works are required by Sydney Airport and no operational disruptions would occur as a result of construction activities.

However, as passenger traffic increases, more traffic congestion would progressively occur within the T2/T3 landside area and, at peak times, would extend onto the nearby arterial road network (including Robey Street, O'Riordan Street, Qantas Drive and Joyce Drive) with flow-on effects for network operations, safety and efficiency of both airport and non-airport traffic.

There is a growing demand from businesses or agencies that require facilities in close proximity to the airport (such as administrative offices, airline and freight businesses, hotels and car parking) .

The 'do nothing' option is inconsistent with commitments presented in Chapter 7 of the Master Plan 2033 in relation to ground transport improvements and Sydney Airport's guiding principle '… to maximise benefits for passengers and the aviation community as a whole, taking into account stakeholder needs through ongoing consultation.'[23]

2.3.3 Improvements to public transport only

Sydney Airport is committed to increasing mode shift from private to public transport for ground access to the airport. As stated in the Master Plan 2033:

> In addition to improving and enhancing the ground transport experience, it is important that customers have a range of choices when accessing the airport. Sydney Airport believes there is a great opportunity for public transport mode share to be increased and has advocated for the reduction of the station access fee on rail and the provision of additional public bus services to the airport …
>
> Sydney Airport has identified a site within the T2/T3 precinct for the future location of a public bus facility designed to allow a greater frequency and volume of public bus services to and from the airport for the benefit of passengers and staff[24].

It is expected that vehicular traffic on the road network will continue to provide the majority of the trips to and from the airport over the planning period regardless of the continued shift to public transport. As a result, it would not be feasible to provide or support improvements by public transport providers as the only means of meeting the forecast ground access demands to and from the T2/T3 precinct.

However, the proposed ground access works in the T2/T3 precinct include the development of a Ground Transport Interchange with a pickup/drop-off facility for buses and coaches on the ground level. This facility will cater for scheduled public bus services as well as commercial coach services and will have capacity to accommodate increases in public transport services to 2033.

23 Sydney Airport 2014a, p10

24 Sydney Airport 2014a, p91

25 Sydney Airport 2009, p91

2.3.4 Options for ground access solutions

Option 1: Master Plan 2009

This option was proposed in the previous Master Plan 2009 in the following terms:

> The Qantas Drive/Robey Street intersection is proposed to be upgraded with a new arm of the intersection leading south into the airport – this entry would also provide segregated access for passenger drop-off and pick-up as well as for staff parking.
>
> To improve the efficiency of transport movements, sections of the existing multi-storey car park in the Domestic Precinct may be replaced with a multi-modal transport interchange[25].

As shown in **Figure 2.1**, this option had:

- a grade-separated right-turn exit from Sir Reginald Ansett Drive;
- a grade-separated link between Ross Smith Avenue and the Ground Transport Interchange; and
- Seventh Street extension but as a two-way link, not a one-way system.

The construction of the elevated structures would require service disruptions to traffic and there is a high probability the structures would not be compatible with future off-airport road concepts.

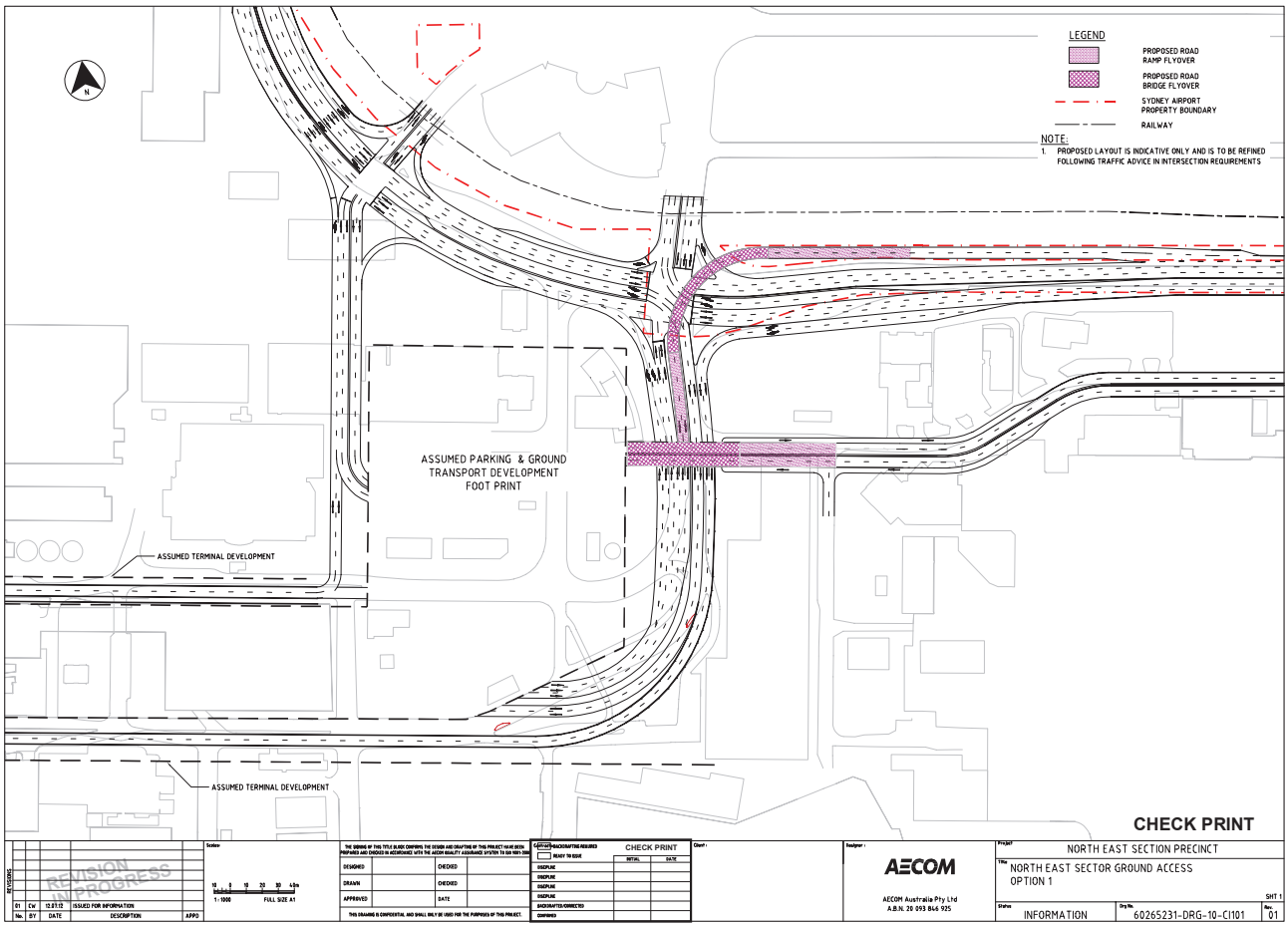
Option 2: Qantas Drive /Joyce Drive grade-separation

As shown in **Figure 2.2**, this option proposes:

- a grade separated fly-over past the airport for non-airport traffic;
- a grade-separated link between Ross Smith Avenue and the proposed Ground Transport Interchange; and
- Seventh Street extension but as a two-way link, not a one-way system.

This option has a similar function to the off-airport future motorway concepts which generally support non-airport traffic. Therefore, although it would provide improved intersection performance, it would not directly benefit airport users.

Figure 2.1 Option 1: Master Plan 2009



Source: AECOM

Option 3: variation on Option 2

As shown in **Figure 2.3**, this option is similar to Option 2 but with additional grade-separated links between the proposed Ground Transport Interchange and Qantas Drive at various grades.

This option is considered even more complex than Option 2 in terms of its constructability for existing through traffic, as it would require significant modifications to the existing network arrangements.

Option 4: off-airport solution

As shown in **Figure 2.4**, this 'off-airport' option would provide a direct link from Qantas Drive to a relocated intersection of Bourke and O'Riordan Streets to reduce pressure on intersections adjacent to the T2/T3 precinct.

This design would prevent Sydney Airport's future plans for an international terminal in this precinct and was therefore not considered further.

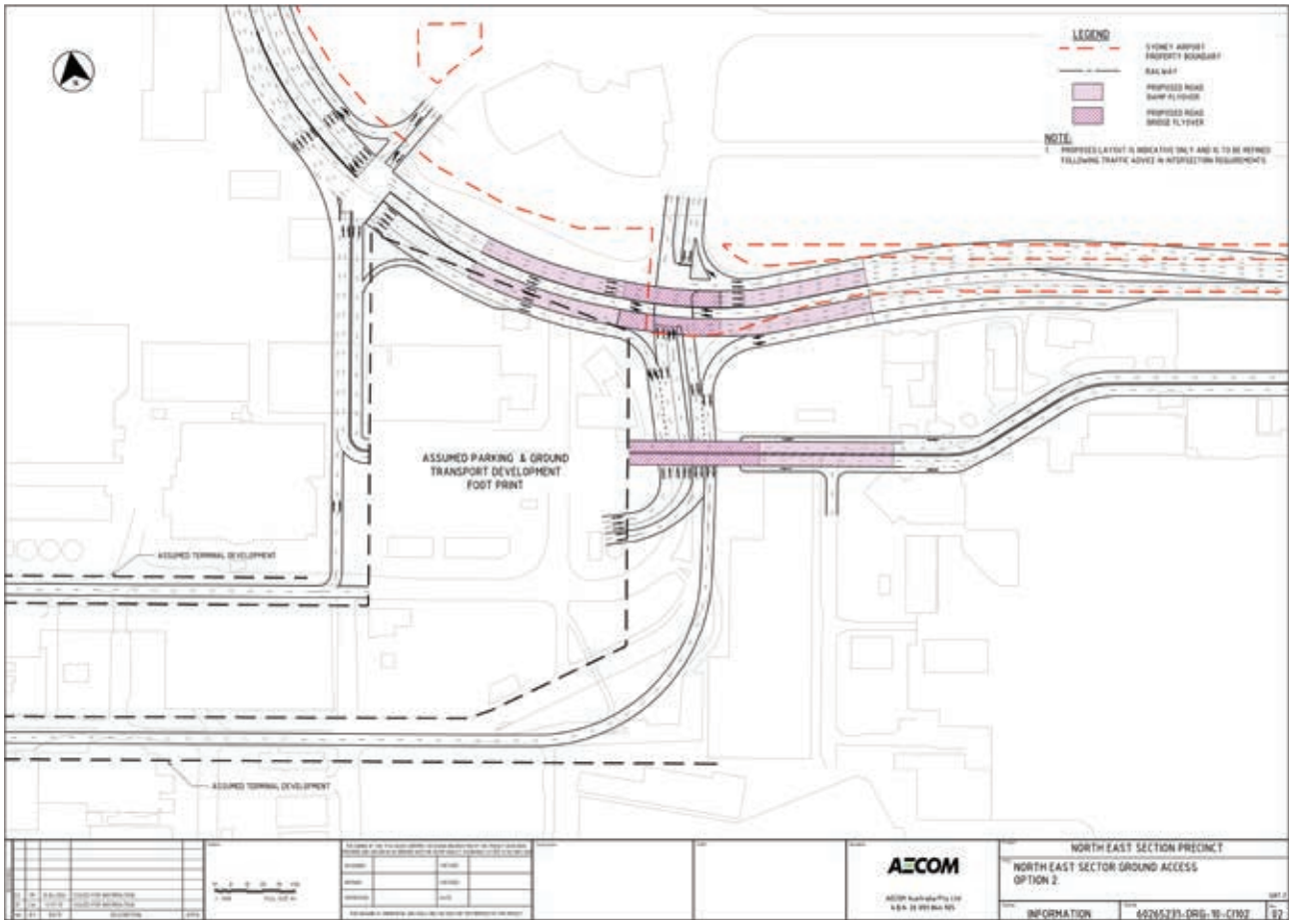
Option 5: Master Plan 2033 – integrated solution (preferred option)

This option would increase green-light time at the major intersections by up to 33 per cent and reduce conflict between entering and departing traffic in the T2/T3 precinct. As a result, this is the preferred option for consideration in this MDP.

As shown in **Figure 2.5**, this option includes:

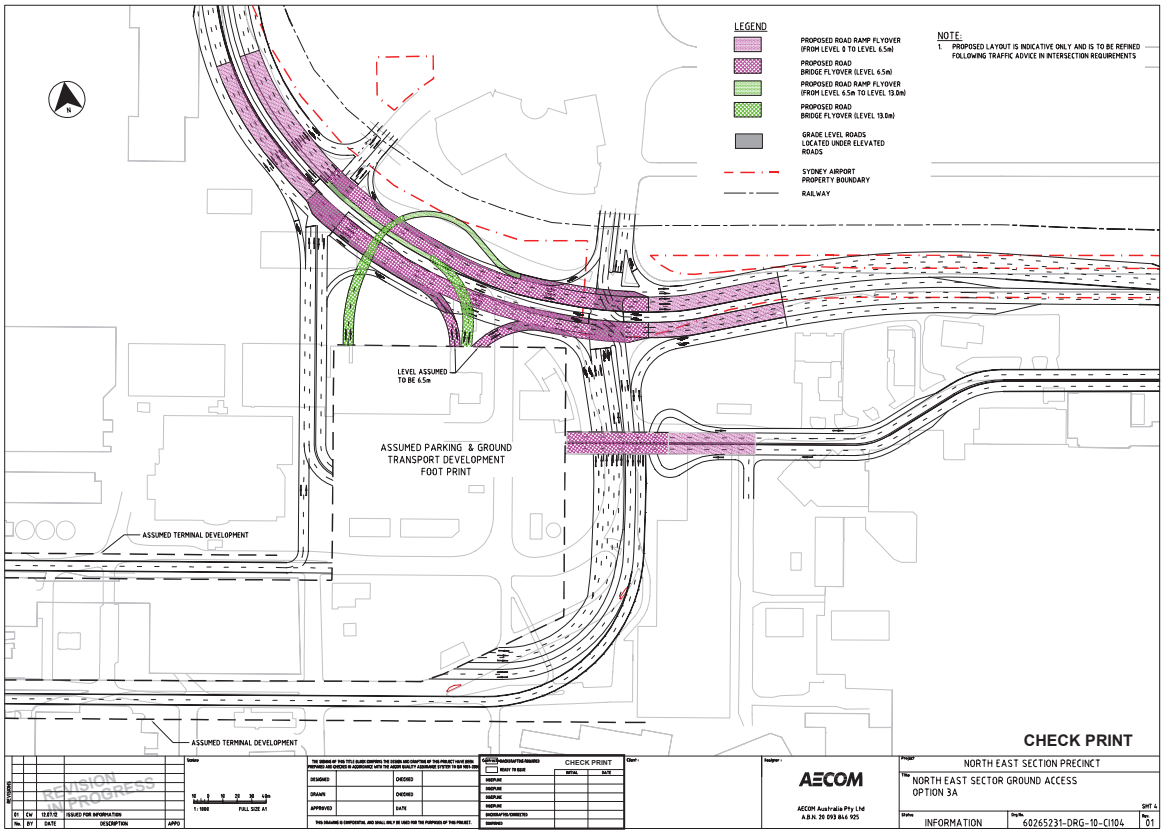
- development of a one-way road system within the T2/T3 precinct by:
  - constructing a new road connecting Shiers Avenue to Qantas Drive (the extension of Seventh Street) through the current Southern Hangar Line adjacent the Jet Base to link with a reconfigured intersection;
  - reconfiguration of Sir Reginald Ansett Drive to one-way entry only to the precinct from Joyce Drive and Qantas Drive;
- widening of Qantas Drive between Robey Street and O'Riordan Street to three lanes each in both directions and associated turning lanes;
- other localised changes to the T2/T3 precinct roadway system;
- construction of three additional floors on the P3 parking structure and a bridge link to the P2 parking structure to provide a net increase of approximately 350 bays and pedestrian/vehicle connectivity;

Figure 2.2 Option 2: Qantas Drive/Joyce Drive grade-separation



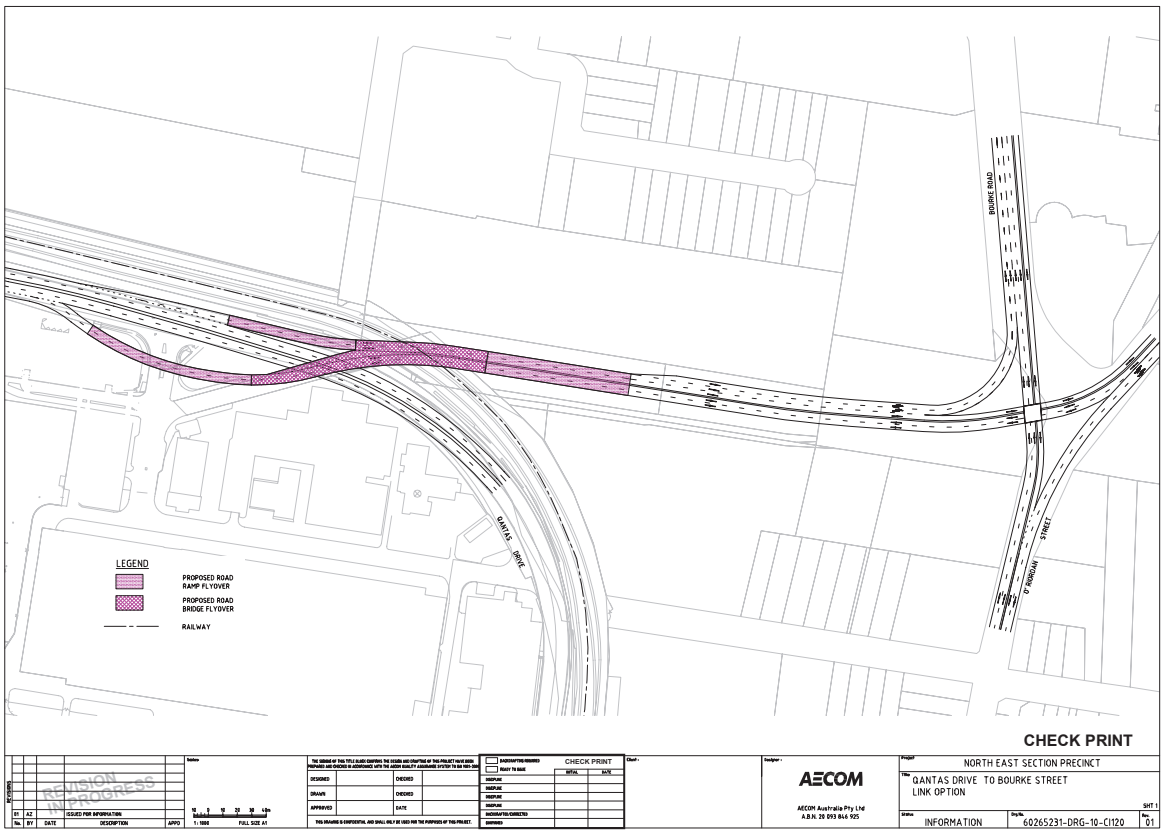
Source: AECOM

Figure 2.3 Option 3: variation on Option 2



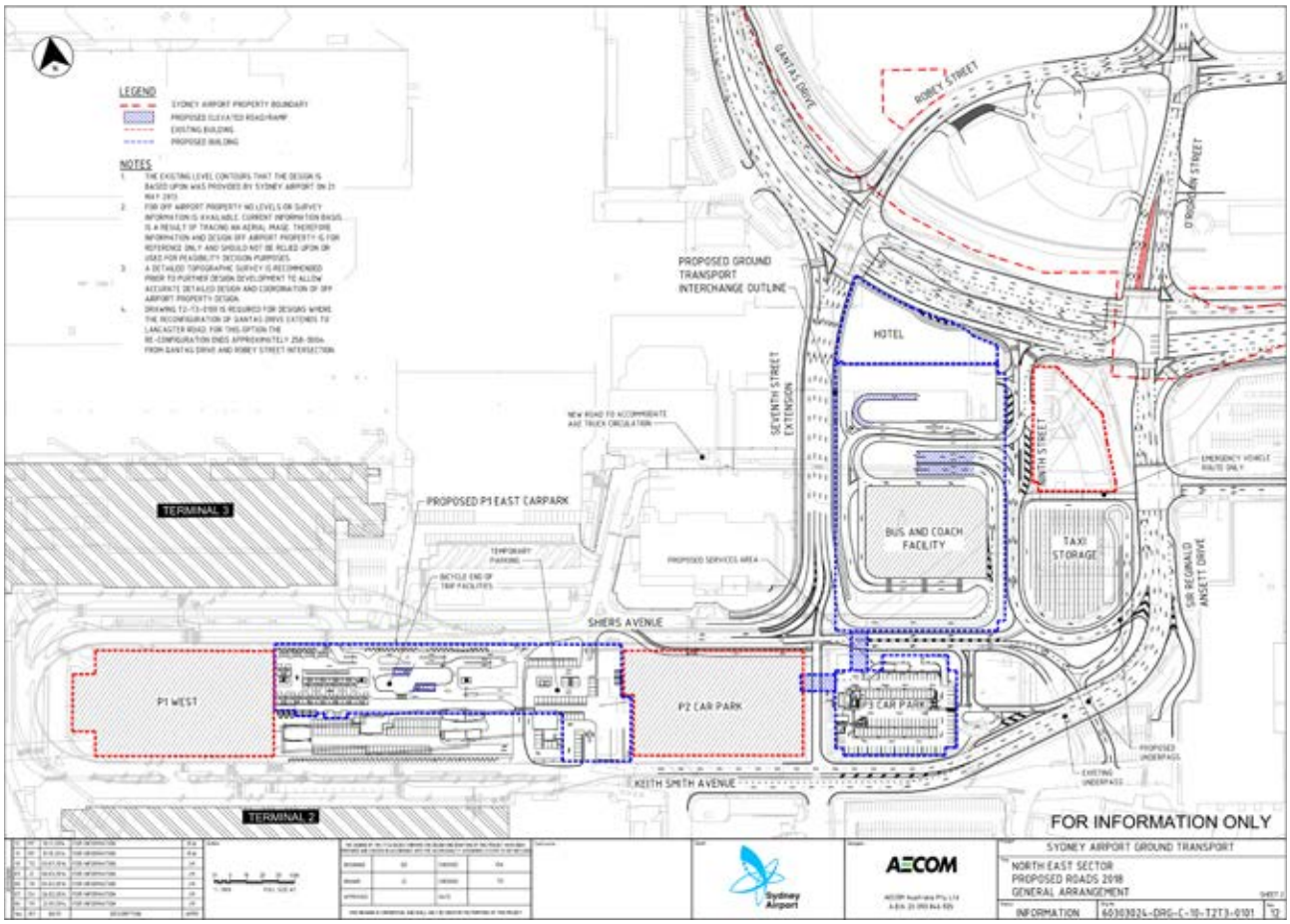
Source: AECOM

Figure 2.4 Option 4: off-airport solution



Source: AECOM

Figure 2.5 Option 5: integrated solution (preferred option)



Source: AECOM

- construction of a new parking structure to replace the eastern structure of P1 with a net increase in parking for approximately 1,250 vehicles including an above ground pedestrian corridor with assisted walkways in both directions;
- development of a multi-level Ground Transport Interchange to the east of the Seventh Street extension that includes:
  - a bus and coach facility at ground level that accommodates public buses, including the recently introduced double decker public buses;
  - multi-modal parking and storage for approximately 4,000 vehicles;
  - access to and exit from the new one-way road system at grade; and
- development of a dedicated pedestrian path through P2 and P3 to the Ground Transport Interchange resulting in a loss of approximately 100 bays.

This option also reflects the close consultation between Sydney Airport and the NSW Government in relation to the following announced Off-Airport Complementary Works (as described in Chapter 5):

- widening of Joyce Drive and General Holmes Drive between O'Riordan Street and Mill Pond Road;
- reconfiguring Robey Street to one-way northbound from Qantas Drive to O'Riordan Street; and
- reconfiguring O'Riordan Street south of Robey Street to one-way southbound to Qantas Drive/Joyce Drive, including the intersection of O'Riordan Street, Qantas Drive, Joyce Drive and Sir Reginald Ansett Drive.

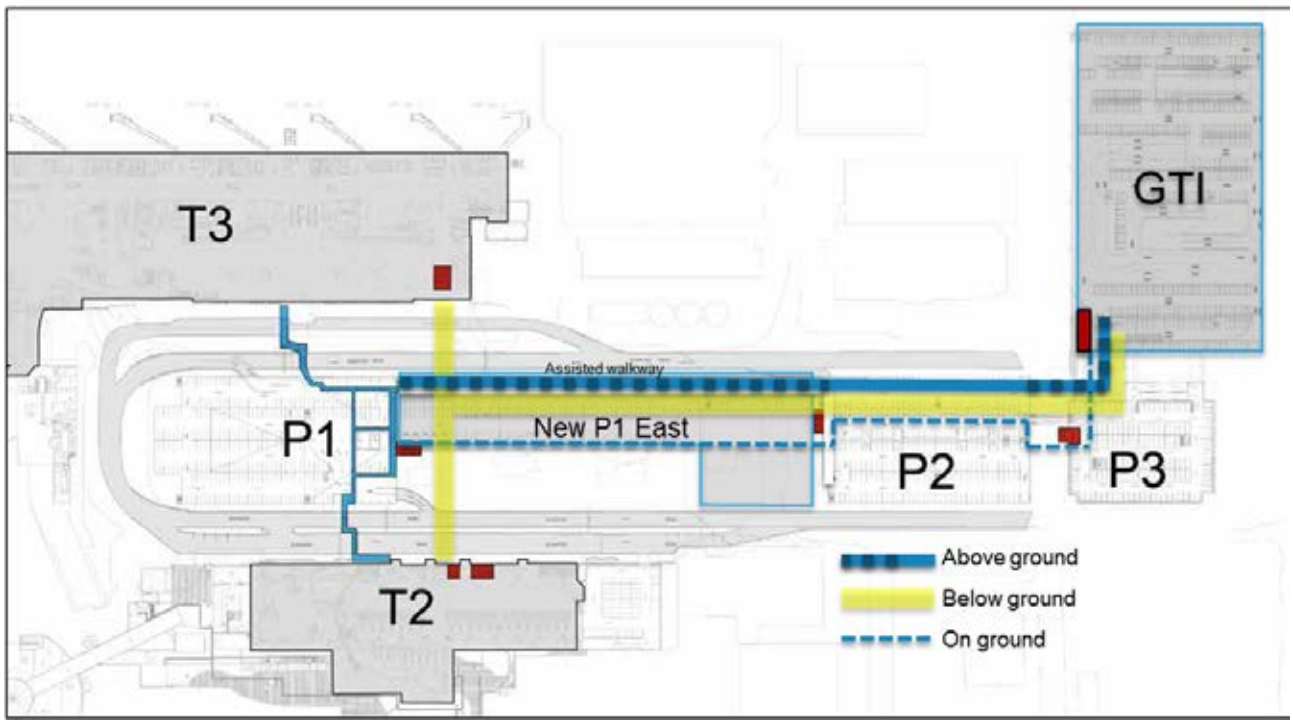
2.3.5 Pedestrian experience options

As part of the proposed development, consideration was given to developing a pedestrian experience that will improve on the current infrastructure, reduce pedestrian/vehicle conflict and make it easier and safer to move between the terminals and bus, rail or car park facilities in the T2/T3 precinct.

Three options were considered (see **Figure 2.6**):

- **On ground** – extending the existing pedestrian arrangements via an informal path eastwards from T2 and T3 through the ground levels of the existing P1, P2 and P3 parking structures to link to the GTI via signalised pedestrian crossings on Seventh Street and Shiers Avenue;

Figure 2.6 Options explored for a pedestrian corridor



- **Below ground** – constructing a pedestrian tunnel generally under the northern side of the existing P1, P2 and P3 parking structures to the east of Seventh Street then turning northwards to pass under Shiers Avenue to link into the GTI. This tunnel would connect to the existing underground link between T2, T3 and the Domestic rail station; or
- **Above ground (the preferred option)** – demolish and redevelop the P1 East car park with an above ground pedestrian corridor incorporating bi-directional assisted walkways along the northern face of the new structure. Continue the corridor through P2 level three by removing car parking spaces and construct bridges between P2-P3 and P3-GTI to extend the corridor to the GTI. Opportunities to install additional assisted walkways in this corridor would be explored during detailed design.

A high-level multi-criteria analysis was used to evaluate these three T2/T3 pedestrian experience options, including:

- minimise walking distances;
- maximise moving walkways;
- pedestrian amenity/experience;
- pedestrian and vehicle separation;
- disabled access;
- constructability;
- longevity/redundancy/planning resilience;
- impact on car park operations; and
- cost.

The results of this analysis are summarised in **Table 2.1**.

2.3.6 Active transport facilities

The inclusion of active transport facilities for pedestrians and cyclists is a key planning principle for the proposed ground access improvements.

In addition to improved shared path links planned as part of the proposed development, other facilities to promote cycling will include:

- undercover bicycle racks located near public areas within the Ground Transport Interchange, P2 and the new P1 East car park near terminals T2 and T3 to provide storage for at least 90 bicycles which can be expanded based on demand; and
- end-of-trip facilities and amenities such as bicycle storage, bathrooms and lockers located in the Ground Transport Interchange and the new P1 East car park.

Table 2.1 Analysis of pedestrian experience options

Option	Advantages	Disadvantages
On ground (existing situation upgraded)	• Improvements to wayfinding and amenity can be implemented rapidly • Cost effective	• No moving walkways • No change to walking distances • Complex wayfinding with many direction changes. • Multiple vehicle crossings • Impacts to car park operations • Not accessible friendly from GTI to terminals
Below ground	• Links to existing underground T2/T3 rail connection • Only two changes of direction • Removal of all conflicts with vehicles • Majority of distance could be serviced by moving walkways	• Very high cost • Complex engineering with crossing over the rail tunnel • Construction will impact on parking operations • Requires additional lifts or inclined moving walkways to reach ground level • High risk of impact to underground services
Above ground (preferred option)	• Provides for moving walkways through a portion of the pedestrian corridor • Possibly only two changes of direction • Removes most pedestrian/vehicle conflict • Minimal impact to car park operations • Opportunity to improve parking experience close to terminal	• Construction more disruptive than 'On ground' option • Some sections of the corridor cannot accommodate moving walkways

2.3.7 Need for proposed hotel development

Contemporary planning and development trends on and around major airports in both Australia and internationally are increasingly including the provision of a range of hotel accommodation options. The demand for such accommodation is generated by a number of airport-related factors, including: local business communities; flight arrivals and departures at times that make an overnight stay a convenient option for airline passengers; passenger needs following unanticipated flight cancellations due to adverse weather or for operational reasons; business or other conference-related reasons; and flight crew accommodation for transit, training or other reasons. Accordingly, a number of market segments now expect that a range of hotel accommodation options at various price points will be available in close proximity to an airport's passenger terminals, including those at Sydney Airport.

As an added benefit, the hotel proposed in this MDP will create approximately 150 construction jobs and, on completion and once operational, around 75 full time and 75 part time staff positions.

The proposal outlined in the MDP is an opportunity to develop a new hotel that is located on the airport site and is within convenient walking distance to both T2 and T3. The proposed hotel will form part of the business community at Sydney Airport, will facilitate demand drivers for local suppliers for goods and services to the hotel and will be an integral part of the airport's local business economy.

2.3.8 Hotel development site options

It is proposed to construct a conveniently located, 4 to 5 star hotel within the T2/T3 precinct to meet the demand from airline passengers. Within the planning parameters discussed in Section 2.2 above, the only feasible site for the proposed hotel within the project area is the site located on the northern side of the Ground Transport Interchange (see **Figure 2.5**) because:

- the Ground Transport Interchange and multi-modal car parking and storage structure need to be located so that walking distances to T2/T3 are manageable, and direct vehicle and pedestrian links can be provided between the Ground Transport Interchange and P3;
- the facility for public buses must provide easy access to and exit from the precinct that will ensure bus timetables are consistent and predictable;
- the irregular shape of the northern part of the land between the Seventh Street extension and Ninth Street lends itself more to a hotel with a smaller floor plate and scope for design flexibility;
- the northern boundary of this site which will abut Qantas Drive will provide excellent visibility for a building of high quality design such as a 4 or 5 star hotel; and

- the maximum building height for the site on the northern side of the Ground Transport Interchange is determined by the OLS of approximately 44 metres AHD. Through this MDP, Sydney Airport is proposing a built form consistent with height restrictions determined by the OLS in order to provide maximum design flexibility during the delivery process.

For these reasons, the preferred site for the proposed hotel is the site to the immediate north of the Ground Transport Interchange between the Seventh Street extension and Ninth Street and bordered on its northern side by Qantas Drive.

2.4 Conclusions about the proposed development

Based on the above consideration of options and consistent with the Master Plan 2033 and the intentions set out in the Five Year Ground Transport Plan and Commercial Development Plan as well as the particular planning considerations within and in the vicinity of the project area, Sydney Airport is proposing to implement Option 5, its preferred range of ground access improvements in the T2/T3 precinct, the above ground pedestrian corridor experience from the Ground Transport Interchange to the terminals and a hotel on the abovementioned site.

As noted in Section 2.1, sections of Robey Street and O'Riordan Street require sufficient capacity to support peak airport, commuter and Port Botany traffic. Sydney Airport continues to discuss with the NSW Government the importance of addressing the future capacity of these and other streets beyond the airport boundary. However, this capacity enhancement is beyond the jurisdiction of Sydney Airport. For optimal benefits of the proposed T2/T3 ground access improvements, Sydney Airport considers that completion of complementary off-airport capacity enhancements would be appropriately aligned prior to the completion of the on-airport T2/T3 ground access works (see Chapter 5).


All Gates,
Express Path
Shops
Food

Chapter 3

Community Consultation and Engagement

CHAPTER

3 / COMMUNITY CONSULTATION AND ENGAGEMENT

KEY POINTS

- Sydney Airport actively consults and engages with all its stakeholders on an ongoing and regular basis:
  - Our stakeholders include the community, government, business, the tourism industry and the aviation industry; and
  - We consult about the operation of, proposed development at, and future planning for the airport.
- While preparing the recently approved Master Plan 2033, Sydney Airport conducted extensive community and stakeholder consultation and engagement, including on the proposed ground transport solutions and commercial developments.
- Overwhelmingly, the feedback on the proposed ground access solutions from many of the several hundred people who attended one of the community information sessions was positive.
- In preparing this MDP, Sydney Airport had regard to the ground transport-related comments in the submissions received and comments made during the Master Plan 2033 consultation process.
- In relation to the specific developments proposed in the pdMDP, Sydney Airport undertook a targeted initial consultation process involving briefings of relevant key stakeholders. During the formal 60 business-day public comment period, Sydney Airport carried out further consultation and engagement with the community and other key stakeholders.
- After carefully considering the 126 submissions and feedback received during the initial formal public comment period, the pdMDP was updated.
- Before submitting the updated version to the Australian Government for consideration, Sydney Airport provided a further opportunity for the community and other stakeholders to comment on the updates. Further comments received were considered and appropriate changes made to produce this MDP.
- Given the need to coordinate on-airport ground transport works with those off-airport works to be undertaken by the NSW Government, Sydney Airport has consulted with Transport for NSW, NSW Roads and Maritime Services, and the WestConnex Delivery Authority and will continue to do so.
- Sydney Airport is committed to on-going community and stakeholder engagement during the construction phases of the proposed T2/T3 Ground Access Solutions and Hotel to ensure the temporary impacts of construction work are understood by all and managed accordingly.

SYDNEY AIRPORT HAS ENGAGED EXTENSIVELY WITH RELEVANT STAKEHOLDERS IN THE DESIGN DEVELOPMENT OF THE T2/T3 GROUND ACCESS SOLUTIONS AND HOTEL. THERE IS BROAD STAKEHOLDER SUPPORT FOR THE DESIGN AND FOR SYDNEY AIRPORT'S COMMITMENT TO IMPLEMENT KEY ASPECTS OF THE RECENTLY APPROVED MASTER PLAN 2033.

3.1 Consultation and communications strategy

3.1.1 Sydney Airport's approach to consultation and engagement

In 2010, Sydney Airport adopted a new Community and Stakeholder Engagement Program, which extended and improved existing consultation and engagement activities. The program strengthened the constructive and proactive relationships between Sydney Airport and the airlines, community, governments, the aviation industry and other stakeholders.

The program seeks to ensure that Sydney Airport:

- genuinely consults and engages with the community, government, aviation industry, business and other stakeholders about the operation of, proposed developments at, and future planning for Sydney Airport;
- works co-operatively with Australian and NSW Government agencies, local governments and other organisations that have roles and responsibilities involving or affecting Sydney Airport;
- communicates and makes available relevant and accurate information about Sydney Airport to the community and other stakeholders in a timely manner in a form that is easy to understand and in a way that reaches all stakeholders; and
- listens to and genuinely considers feedback from the community and other stakeholders and, where practicable, resolves issues of concern.

Sydney Airport's approach to consultation meets the statutory requirements of the *Airports Act 1996* and is consistent with the Australian Government's suggested approach to effective consultation presented in the *Airport Development Consultation Guidelines*[26]. These guidelines are viewed as setting the minimum standard for consultation for Commonwealth-leased airports.

3.1.2 Communications and consultation strategy for this MDP

The communications and consultation strategy for the T2/T3 Ground Access Solutions and Hotel MDP process involves the following stages:

- initial consultation and briefings held with key stakeholders during the preparation of the pdMDP;
- preparation of an exposure draft MDP and submission to the Department of Infrastructure and Regional Development for comment;
- notification in accordance with the requirements of the *Airports Act 1996* that the pdMDP has been made available for public comment, including an invitation to submit written comments;
- wide dissemination of the pdMDP, background and supporting information (including details of how to get further information and how to comment) to the community and other stakeholders during the public comment period;
- offers of briefings and opportunities to obtain further information to the community and stakeholders during the public comment period;
- due regard given to all comments received during the public comment period and, where appropriate, the pdMDP revised;
- further opportunity for the community and other stakeholders to comment on the revised pdMDP before it is finalised to produce the dMDP; and
- the dMDP – plus all comments received and related documents required by the *Airports Act 1996* – submitted to the Minister for Infrastructure and Regional Development for consideration.

The Minister decides whether or not to approve the dMDP, with or without conditions. If approved, it becomes the final Major Development Plan.

26 DIRD, 2007

3.2 Initial stakeholder consultation and briefings

Sydney Airport's Master Plan 2033 includes a 20 year ground transport strategy and a Five Year Ground Transport Plan. Together, they set out comprehensive ground transport solutions for Sydney Airport over the 20 year planning period.

While preparing the recently approved Master Plan 2033, Sydney Airport conducted extensive community and stakeholder consultation and engagement, including on proposed ground transport solutions.

Overwhelmingly, the feedback on the proposed ground transport solutions from many of the several hundred people who attended one of the community information sessions was positive. Many of the written submissions received during the formal master plan public comment period from a number of key aviation, community, government, business and tourism stakeholders were also supportive of the proposed ground transport solutions, including those presented in this MDP for the T2/T3 precinct.

The Master Plan 2033 consultation process – which occurred throughout 2012 and 2013 – involved:

- approximately 450 individual briefings and meetings with key stakeholders;
- 20 community information sessions in shopping centres, community markets and public libraries near the airport;
- a Master Plan community information brochure distributed to more than 200,000 households in local government areas around the airport;
- community updates published in local newspapers circulating across the Sydney metropolitan area (including in community language newspapers); and
- Master Plan information provided on the Sydney Airport website and through Facebook and Twitter.

In preparing the pdMDP released for public comment, Sydney Airport had regard to the ground transport-related comments in the submissions received and comments made during the Master Plan 2033 consultation process.

In relation to the specific developments proposed in the pdMDP, Sydney Airport undertook a targetted consultation process involving briefings of relevant key stakeholders. Sydney Airport also provided the Department of Infrastructure and Regional Development with an exposure draft version of the pdMDP, which was then referred to the Department of the Environment, Airservices Australia and the Civil Aviation Safety Authority for review and comment. As part of this process, the Department of the Environment determined that the pdMDP was unlikely to have a significant impact on the environment under Section 161A of the Environment Protection and Biodiversity Conservation Act 1999. A summary of the issues raised by these stakeholders is presented in Appendix E.

Given the extensive amount of consultation that has already been undertaken, the next stage of consultation concerning the pdMDP focused on issues concerning implementation of the proposed ground transport solutions.

Given the need to coordinate on-airport ground transport works with those off-airport works to be undertaken by the NSW Government (see Chapter 5), Sydney Airport consulted with TfNSW, RMS and the WestConnex Delivery Authority (WDA) and has continued to do so during the pdMDP public comment periods. The City of Botany Bay Council – in whose local government area the works outlined in this MDP are proposed to occur – have also been consulted closely.

Prior to the commencement of the public comment period, as required by Section 92(1A) of the *Airports Act 1996*, Sydney Airport formally advised in writing to the NSW Minister for Planning and Infrastructure (as the portfolio was then known), NSW Planning and Infrastructure (as the portfolio was then known), plus the councils of the City of Botany Bay, Marrickville, the City of Sydney, Rockdale City and Sutherland Shire of its intention to submit the dMDP to the Minister for Infrastructure and Regional Development.

3.3 Public comment period for the pdMDP

The *Airports Act 1996* requires the pdMDP to be made available for public comment for 60 business days. The pdMDP was on public exhibition from 1 July 2014 until 22 September 2014.

During this time, copies of the pdMDP were made widely available to the public and other stakeholders, either via download free of charge from the Sydney Airport website, in hard copy for viewing in public locations in suburbs around Sydney Airport or from Sydney Airport Corporation Limited's corporate office. As required by Section 92(1) of the *Airports Act 1996*, a notice specifying this information was placed in newspapers circulating in NSW (*Sydney Morning Herald* and *Daily Telegraph*). Given the significance of Sydney Airport to NSW overall, these measures/actions ensured that stakeholders beyond the Sydney metropolitan area were aware of the availability of the pdMDP for public comment.

Throughout the public comment period, Sydney Airport's aim was to ensure that all stakeholders were able to:

- easily access a written or electronic copy of the pdMDP, supporting documents and background information in a location convenient to them;

- make contact with and speak directly to Sydney Airport representatives to ask questions and seek further information about the pdMDP; and
- provide stakeholders with various means of making a submission and commenting on the pdMDP.

As stated in its Community and Stakeholder Engagement Program, Sydney Airport was mindful of the need to ensure that the consultation process for the pdMDP had regard to the diversity in the local community in relation to such factors as age, education, language, cultural background and access capability. A variety of consultation and communication mechanisms were used that are suitable for a wide range of people and groups. This ensured that all members of the community had an opportunity to view the pdMDP and to make comments.

Sydney Airport therefore:

- published community updates in relevant local community newspapers (including community language newspapers) circulating in the Sydney metropolitan area;
- held two community information "drop-in" sessions, one in Mascot and the other in the Maroubra Junction shopping centre, at which Sydney Airport representatives were on hand to explain details and answer questions – the date, time and location of these sessions were advertised in advance in local newspapers and on the Sydney Airport website. Residents living in the vicinity of T2/T3 precinct, including the suburbs of Mascot and Botany were also notified directly. Around 300 people attended these sessions;
- set up a community information line and dedicated email service to facilitate information exchange; and
- ensured relevant information about the pdMDP was included on Sydney Airport's website and, where relevant, Sydney Airport's Facebook page.

The pdMDP and supporting documents were distributed to:

- all members of the NSW Parliament and members of the Australian Parliament representing electorates in the Sydney metropolitan area;
- all local councils in the Sydney metropolitan area;
- heads of agencies of relevant agencies of the Australian and NSW Governments;
- all members of the Sydney Airport Community Forum; and
- all members of the Sydney Airport Planning Co-ordination Forum.

3.4 Issues raised in submissions

During the formal public comment period, 117 submissions were received. A further 9 late submissions were received, making a total of 126. The content of 67 submissions was identical.

The submissions raised a wide variety of issues, including:

- broad support for Sydney Airport's proposed upgrades to the road network and traffic management arrangements in the T2/T3 precinct. A number of suggestions were made for various minor readjustments;
- support for the proposal to develop the new hotel;
- suggestions and recommendations from many stakeholders concerning the need to improve access to the T2/T3 terminal precinct by active transport modes (cycling and walking), including:
  - safe, direct and integrated connections between the off-airport cycleway network and the airport terminal precincts;
  - additional well-located and secure bike parking;
  - end-of-trip facilities (eg. showers and lockers); and
  - potential conflict between pedestrians and cyclists on the proposed shared paths;
- support for the proposed new bus facility within the Ground Transport Interchange though some submissions raised concern about its distance from the front entrances to T2 and T3;
- a range of issues concerning public transport access to Sydney Airport, including:
  - seeking abolition or reduction of the station access fee;
  - trains servicing Sydney Airport need to be more 'passenger friendly' and include space for luggage;
  - support for an increase in the number of bus routes servicing Sydney Airport and suggestions concerning specific route locations; and
  - location of bus stops for existing and proposed new bus routes;
- the need to ensure Sydney Airport's on-airport road works are coordinated with those being undertaken by the NSW Government as part of Its WestConnex enabling works;
- various suggestions concerning the proposed WestConnex enabling works to be undertaken in the vicinity of Sydney Airport by NSW Roads and Maritime Services and issues concerning traffic modelling;
- concern that an increase in car parking spaces will encourage more people to drive to the airport, adding to traffic congestion;
- need to ensure that passengers trying to access T2 or T3 while construction is underway are able to do so conveniently and without unnecessary disruption; and
- need to ensure Sydney Airport has an implementation strategy that will not disrupt airport and airport tenant operations, even during overnight curfew periods.

3.5 Revised pdMDP and further consultation

Sydney Airport carefully considered and had due regard to all submissions and comments received during the formal 60 business day public exhibition period. As a result of the due regard process, Sydney Airport revised the pdMDP.

Sydney Airport also held a further round of targeted consultations with key stakeholders as part of the revision process. The issues raised by these stakeholders are summarised in Appendix F.

Key changes to the original version of the pdMDP included:

Better and safer pedestrian linkages

To separate pedestrians from traffic, a new elevated pedestrian corridor will connect the Ground Transport Interchange (GTI) and other car parks P1, P2 and P3 with the T2 and T3 passenger terminals. Some of the existing car parks in the T2/T3 Domestic precinct will be modified or rebuilt to cater for:

- the new elevated pedestrian corridor, with two-way assisted walkways provided in the new built section, and
- the additional bicycle storage area and end-of-trip facilities for cyclists.

Additional car parking spaces will be provided in the new and modified car parks. These additional spaces will be offset by an equivalent reduction in the number of car parking spaces originally provided for in the Ground Transport Interchange.

Better and safer access and facilities for cyclists

Sydney Airport acknowledges the growing demand for bicycle access and facilities from the general public and passengers in the terminal precinct. Accordingly the pdMDP was revised to include:

- an increase in bicycle storage in the Ground Transport Interchange;
- an additional bicycle storage area with end-of-trip facilities that will be provided closer to the T2 and T3 passenger terminals in the redeveloped P1 East car park; and
- although beyond the MDP project boundary, Sydney Airport will continue to work with the NSW Government and local councils to ensure effective linkages between on-airport pedestrian–cyclist shared paths and the off-airport cycleway network, as outlined in the NSW Government's Sydney's Cycling Future.

Before submitting the revised proposal to the Deputy Prime Minister and Minister for Infrastructure and Regional Development for consideration, Sydney Airport gave the community and other stakeholders a further opportunity to comment.

The revised pdMDP was publicly exhibited from 24 November 2014 until 12 December 2014. Each of the 126 stakeholders who made a submission on the original version of the pdMDP were notified and given an opportunity to comment, as was the Sydney Airport Community Forum and the Planning Coordination Forum. A notice was also placed in local newspapers circulating in areas around Sydney Airport inviting the general public to view and comment on the revised pdMDP. The revised pdMDP was available for download free of charge from the Sydney Airport website.

During this second exhibition period, 13 submissions were received, all of which were supportive of the changes that had been made to the original version of the pdMDP, or raised similar or the same issues as were raised in earlier submissions.

Sydney Airport carefully considered these further comments and, where appropriate, further revised the pdMDP to produce the dMDP, which was submitted to the Minister for Infrastructure and Regional Development for consideration on 22 December 2014. Under the *Airports Act 1996*, the final decision to approve the dMDP – with or without conditions – rests with the Minister.

This MDP was approved by the Minister for Infrastructure and Regional Development on 12 March 2015.

3.6 Ongoing community and stakeholder engagement

Sydney Airport is committed to on-going community and stakeholder engagement during the construction phases of the proposed T2/T3 Ground Access Solutions and Hotel.

The following activities will be undertaken to publish the final MDP:

- public notices will be placed in a newspaper circulating across NSW and relevant local community newspapers regarding the outcome of the Minister's assessment of the dMDP;
- a copy of the approved MDP will be displayed in Sydney Airport Corporation Limited's corporate offices;
- a copy of the approved MDP will be made available for download free of charge on Sydney Airport's website; and
- letters will be sent to everyone who made a submission during the public comment period, members of parliament representing electorates in the Sydney metropolitan area and local councils providing details of the outcome of the Minister's assessment of the dMDP.

The following communications activities are proposed during the construction phases of the project:

- local councils and residents in the vicinity of the site of the proposed development will be advised of the following information in writing before work commences:
  - the date on which construction work will commence;
  - a description of how construction will proceed, including relevant timetables;
  - what changes they can expect to see;
  - details of where to get further information; and
  - details of the complaints management system to be used during the construction period (see Section 3.7).
- community updates will be provided on Sydney Airport's website and to residents in the vicinity of the site of the proposed development during the construction period;
- public notices as required will be placed in local and metropolitan newspapers in advance of any construction work commencing that will likely disrupt traffic in the vicinity of the T2/T3 precinct;
- on-site signage as required will be placed in the vicinity of the T2/T3 precinct; and
- briefings and meetings will be organised and held with stakeholders, such as the airlines and other on-airport tenants as required during construction planning and delivery phases.

3.7 Complaints management system

For the construction phases of the project, Sydney Airport will develop a complaints management system that is consistent with Australian Standard AS ISO 10002-2006 Customer Satisfaction – Guidelines for complaints handling in organisations.

The system will be designed to provide a complainant with access to an open and responsive complaints-handling process and enhance Sydney Airport's ability to resolve complaints in a consistent, systematic and responsive manner.

The complaints management system will include:

- a community complaints service, including an email address and phone service which will be staffed during business hours and have a telephone answering service after hours; and
- a mechanism for the review of responses to complaints.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Chapter 4

The Proposed Development

CHAPTER

4 / THE PROPOSED DEVELOPMENT

KEY POINTS

- The proposed ground access solutions result in improved road and intersection performance in and around Sydney Airport in 2018 and beyond. Planned enhancements to these solutions support the forecast road traffic associated with airport activity beyond the 20 year planning horizon of the Master Plan 2033.
- The major elements of the proposal to be delivered are:
  - construct a new five-lane one-way exit (Seventh Street extension) from Shiers Avenue to Qantas Drive at the Robey Street intersection;
  - reconfigure Sir Reginald Ansett Drive to a one-way entry to the precinct;
  - construct three additional floors on the P3 parking structure and a bridge link to the P2 parking structure to provide a net increase of approximately 350 bays and pedestrian/vehicle connectivity;
  - construct a new parking structure to replace the eastern portion of P1 with a net increase in parking for approximately 1,250 vehicles including an above ground pedestrian corridor with assisted bi-directional walkways and end-of-trip facilities for cyclists;
  - development of a dedicated pedestrian path through P2 and P3 to the Ground Transport Interchange resulting in a loss of approximately 100 bays;
  - construct a multi-level structure, the Ground Transport Interchange, with a bus and coach pick-up/drop-off facility at ground level and parking/storage for approximately 4,000 vehicles above ground;
  - reconfigure Ninth Street for easy entry and exit of buses and coaches to the Ground Transport Interchange;
  - provide additional taxi storage capacity to cater for the increased demand from passengers for this service; and
  - construct a 4 to 5 star hotel with approximately 430 rooms on the eastern corner of Seventh Street extension and Qantas Drive.
- Sydney Airport has consulted with the NSW Government transport agencies in developing and testing the proposed solutions, using the standard Roads and Maritime Services model.
- The proposed works described in this MDP will benefit from additional works beyond the airport boundary that are proposed by the NSW Government, including reconfiguring Robey Street and O'Riordan Street to one-way roads south of the Robey Street/O'Riordan Street intersection.
- Sydney Airport welcomes the commitment of the NSW Government to widen Joyce Drive and General Holmes Drive between O'Riordan Street and Mill Pond Road. These important WestConnex Enabling Works will result in higher traffic throughput capacity to and from the airport as well as for non-airport through traffic including Port Botany heavy vehicle traffic.
- The specifications for the proposed T2/T3 Ground Access Solutions and Hotel will require, as appropriate, that the design, construction and operation of the proposed works incorporate a range of sustainability initiatives.
- The proposed development will be implemented over a number of construction phases which are likely to be delivered concurrently as site, project management and other conditions permit.

THIS CHAPTER DESCRIBES THE PROPOSED DEVELOPMENT IN TERMS OF THE SITE LOCATION, DESIGN CONCEPT, ITS COMPONENTS, VEHICLE AND PEDESTRIAN ACCESS, SERVICES REQUIREMENTS AND CONSTRUCTION STAGING, INCLUDING SUSTAINABILITY AND AIRPORT OPERATION CONSIDERATIONS THAT WOULD INFORM THE DETAILED DESIGN.

4.1 The site for the proposed development

4.1.1 Site conditions and constraints

The proposed works for the T2/T3 Ground Access Solutions and Hotel (the proposed development described and assessed in this MDP) will be located in the central area of the north-east precinct of the airport. This precinct is currently the location of T2 and T3, the Jet Base to the north of T3 and a range of aviation and ground access support functions - including rental cars, flight catering, air freight facilities and car parking – all located throughout the precinct.

The site area for the proposed development is shown on **Figure 4.1** together with existing development and infrastructure in this area. The site area is predominantly flat, with existing levels ranging from approximately 2 metres to 5 metres AHD with drainage generally to the north or north-west towards Alexandra Canal through the Northern Pond with a smaller area draining to the south. The height limits for proposed development are largely prescribed by the Obstacle Limitation Surface (OLS) applicable across the site – approximately 44 metres AHD at the northern end, approximately 46 metres AHD at the western end and approximately 38 metres AHD at the southern end.

To the north of Qantas Drive (which forms the airport's boundary in this area) is the Port Botany to Sydenham freight rail line and the 10 level Airport Central office complex and hotel. These existing developments are not included in the site area for the T2/T3 Ground Access Solutions and Hotel as they are outside the boundary of the airport. However, they are relevant to the Complementary Off-Airport Works described in Chapter 5.

The project area within the airport boundary includes areas designated as airside where aviation activities occur within the security access-restricted boundary and landside where aviation support activities and other activities occur and public access is generally available. The western section of the site area includes the eastern section of the P1 parking structure and the P2 parking structure located immediately west of Seventh Street.

Ground access and circulation within the project area is characterised by a modified grid street layout. The main gateway entry and exit from the north-east precinct and T2 and T3 terminals is provided by the four-way intersection of O'Riordan Street, Joyce Drive, Sir Reginald Ansett Drive and Qantas Drive. This intersection is outside the airport boundary (see **Figure 4.1**). Once inside the airport boundary and south of the Ross Smith Avenue intersection, the two-way road system changes to a one-way, grade separated system in the form of a horseshoe arrangement that provides direct access to departures (upper level) and arrivals (lower level) of both T2 and T3. Information on the existing performance of the roadway system is provided in Chapter 7.

Elements within the site area have been identified as having heritage value. These are discussed in Chapter 8.

Existing landscaping in the project area is restricted to mature trees located in sections of the nature strips of road reserves. Species include spotted gum, grey sheoak, tallowwood and weeping figs (see Section 8.7). The existing gateway to the airport at the intersection of Sir Reginald Ansett Drive with Qantas Drive, O'Riordan Street and Joyce Drive is defined by landscaping consisting of plantings of cabbage fan palm trees, flagpoles, sandstone-coloured stone walls and ground level ornamental planting. Gantry mounted corporate and traffic signage also helps to define the existing gateway function of the southern leg of this intersection.

The Airport Link rail tunnel passes under the project area and includes some above ground structures for the Domestic Station immediately to the south of P1 East. Any piling for footings for the proposed Ground Transport Interchange multi-level structure and the new P1 East parking structure will need to consider the stratum requirements. These aspects will be considered during detailed design.

The existing airside/landside security boundary within the project area runs parallel to and north of Shiers Avenue, west of Sixth Street, south of Ross Smith Avenue and on the south side of Qantas Drive. Within the airside area, existing development includes Hangar 85 (Building 85), Store and Workshop (Building 84), Hangar 58 (Building 58), Component cleaning facility (Building 499), QantasLink wash facility (Building 402), the Ground Support Equipment (GSE)

maintenance facility (Building 415), and disused small stores buildings (Building 97 and 98) as well as related concrete apron areas for aircraft movement. Buildings 84, 85 and 58 are collectively known as the Southern Hangar Line.

Development in the landside area includes rental car facilities on the land bounded by the future Seventh Street extension, Ninth Street and Shiers Avenue as well as a centrally located Telstra communications tower. On the east side of Ninth Street, development includes a Mercedes-Benz showroom, rental car storage and a water pump house and water tank. South of Shiers Avenue and east of Seventh Street is the recently completed seven level P3 car park together with the retained ground level gas refuelling facility for taxis. To the east of this area is a landscaped area bisected by the southbound taxi underpass under Sir Reginald Ansett Drive which allows taxis to recirculate after passenger drop-offs via the taxi storage area and back to T2 or T3 for new passengers.

West of Seventh Street, the eight level P2 car park fully occupies the site bounded by Shiers Avenue to the north, Fifth Street to the west and Keith Smith Avenue to the south. To the east of P2 and linked to it at level 3, the rectangular shaped P1 East car park is located immediately south of Shiers Avenue between T2 and T3 and east of P1 West which occupies the westernmost site within the 'horseshoe' shaped road system serving the terminals and car parks. Immediately south of P1 East, the land is occupied by a number of surface facilities related to the Airport Rail Link with the residual surface area accommodating rental car operations/facilities, the public pickup area, Fourth Street and pre-booked taxi storage area.

4.2 The proposed development

4.2.1 Overview of the proposed works

The proposed T2/T3 Ground Access Solutions and Hotel include the construction and operation of ground access improvements, the development of a Ground Transport Interchange and a hotel within the airport boundary. Existing car parking facilities within the 'horseshoe' shaped road system will be redeveloped, extended and connected to provide a dedicated pedestrian corridor, including assisted walkways where feasible, to link the Ground Transport Interchange and car park facilities to terminals T2 and T3 (see **Figure 4.2**). The proposed development will benefit from complementary road works outside the airport boundary announced by the NSW Government (see Chapter 5).

The proposed ground access improvements will enhance access to and from the T2/T3 precinct from Joyce Drive, Qantas Drive, O'Riordan Street and Robey Street. The double-height ground plus seven level Ground Transport Interchange will include a bus and coach drop-off/pick-up facility and multi-modal parking and storage for approximately 4,000 vehicles. An elevated pedestrian corridor between the Ground Transport Interchange and the terminals will incorporate two way moving walkways on the northern side of the redeveloped P1 East parking facility providing a safe and user-friendly experience. The extension and redevelopment of parking facilities within the "horseshoe" shaped road system will provide an additional 1,500 bays closer to the T2 and T3 terminals. Pedestrian routes, cycle ways and end of trip facilities within the project area will be improved and linked to the wider existing and future pedestrian and cycle networks. The proposed roadway enhancements to be implemented by 2018 are described below and shown on **Figure 4.3**.

The design of the proposed works is based on maximum use of existing road and other infrastructure without the need for external elevated ramps to provide direct access to and from Qantas Drive in the short term.

To meet the demand from airline passengers it is proposed to develop a 4 to 5 star hotel with approximately 430 rooms. The proposed road system reconfiguration will facilitate this development on a site bounded by the Seventh Street extension, Qantas Drive, Ninth Street and the northern side of the proposed Ground Transport Interchange.

Components of the proposed development will be delivered by various procurement methods, for example, design and construct packages. The concept design presented and assessed in this MDP provides the performance criteria which will be used to assess the detailed design submissions for tenderers for individual projects.

Due to the extent of works, the implementation of the proposed T2/T3 Ground Access Solutions and Hotel will be staged in a series of defined projects. Each of the defined projects is described in the following sections.

4.2.2 Project 1 – Seventh Street extension and preparatory works

Preparatory works

Given the extent and nature of the proposed T2/T3 Ground Access Solutions and Hotel, a range of existing buildings, infrastructure and activities within the project area will be displaced before the construction starts on the proposed projects. The affected developments and activities will be either moved elsewhere on the airport, incorporated within the proposed development, removed from the airport site completely, or the activities will cease.

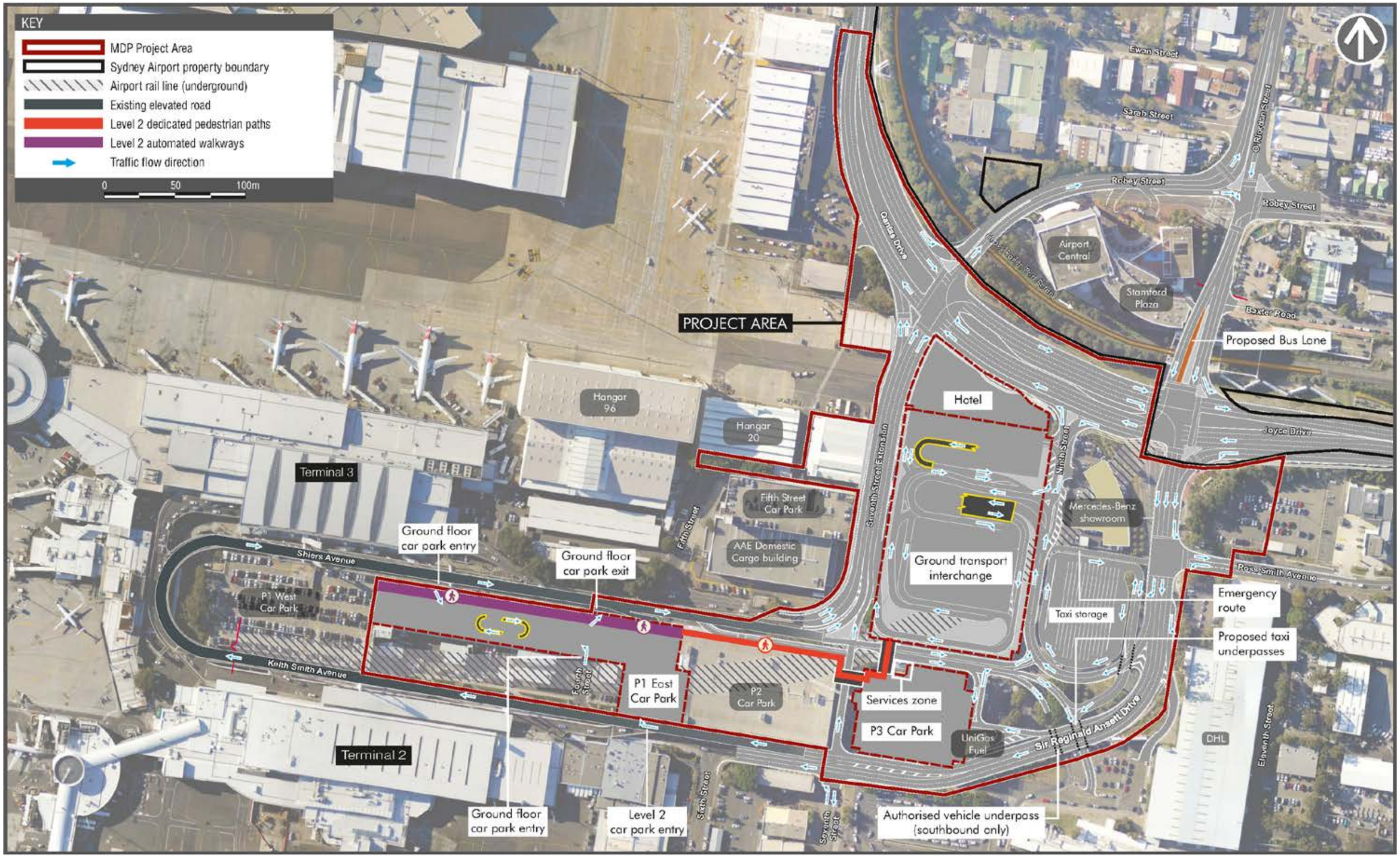
To enable construction of the proposed development, the following preparatory works will be undertaken in advance of the associated Project:

Figure 4.1 Existing development in the project area

Source: AECOM

Figure 4.1 (overleaf)

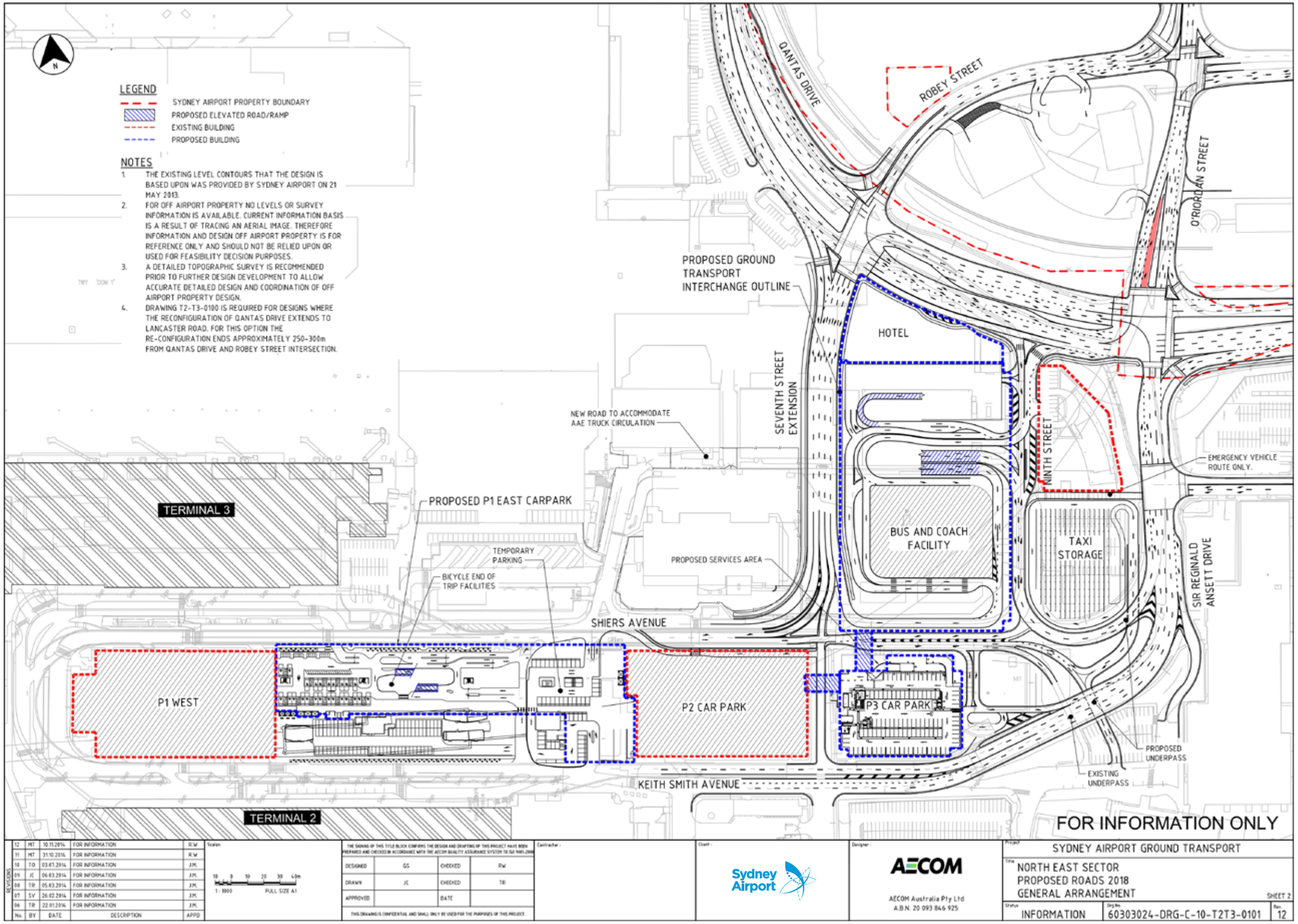
Figure 4.2 Future development in the site area



Source: AECOM

Figure 4.2 (overleaf)

Figure 4.3 Proposed roads 2018 – general arrangement



Source: AECOM

Figure 4.3 (overleaf)

Figure 4.4 Indicative view of Seventh Street extension from Shiers Avenue (looking north)

Source: Cox Richardson

- decommissioning and demolition of the existing Ninth Street substation and installation of a new modular substation;
- temporary relocation of car rental storage (approximately 400 spaces) and quick turnaround facility (QTA);
- relocation of water pump house and tank;
- demolition of Southern Hangar Line buildings – hangars, store and workshop, component cleaning facility, wash facility, and disused small stores building;
- demolition of Ground Support Equipment (GSE) facility; and
- demolition/removal of concrete slab where the Seventh Street extension is to be constructed (hangars and GSE facility);

Seventh Street extension

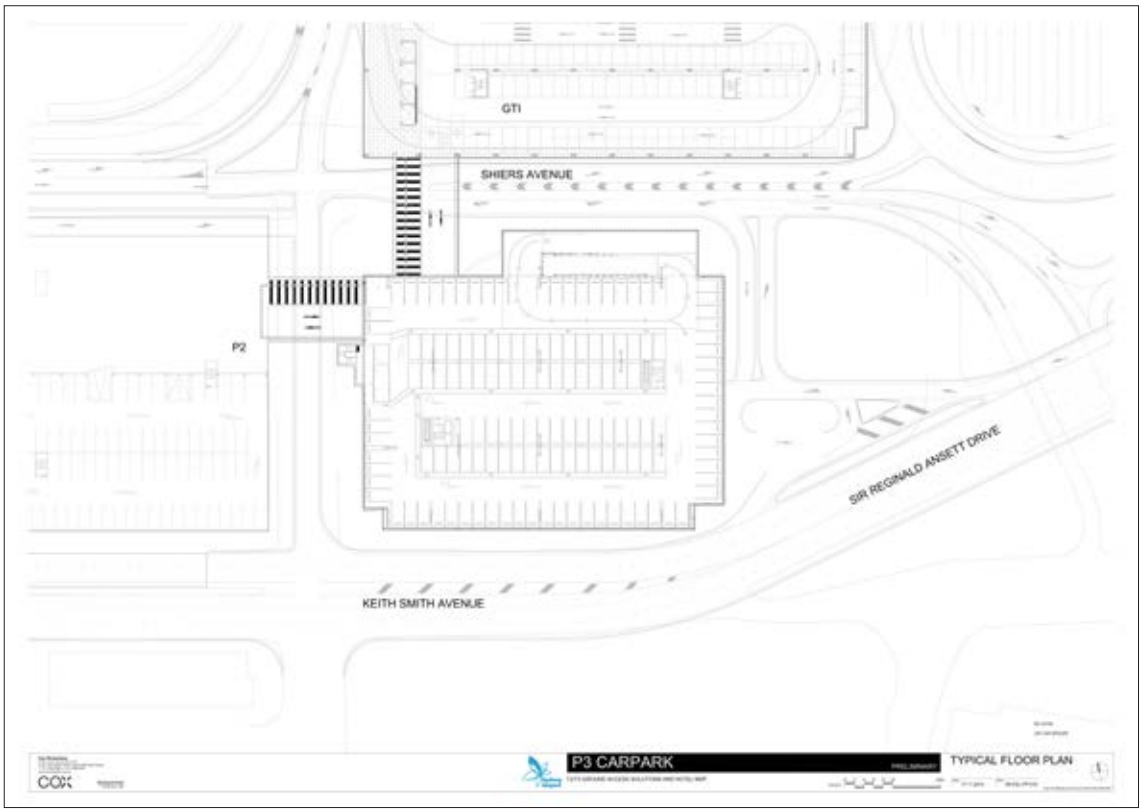
Once required preparatory works are complete, construction of the Seventh Street extension (see **Figure 4.4**) will commence and involve:

- construction of a new roadway (Seventh Street extension) as a new one-way exit road (northbound) from Shiers Avenue/Seventh Street to form the fourth arm of the existing at-grade intersection of Qantas Drive and Robey Street. The design for and construction of this roadway will be five lanes that will widen to six lanes at the intersection with Qantas Drive, providing two lanes each for traffic heading west, north and east;
- provision of a shared pedestrian and cycle path on the western side of this roadway and pedestrian and cycle crossing at the intersection to facilitate connection with pedestrian and cycle networks beyond the airport boundary;
- development of a new extension intersection at Shiers Avenue and the Seventh Street extension;
- modifications to the AAE (Qantas Freight) site to permit circulation of vehicles; and
- construction of a service road on the northern side of the P2 car park from Shiers Avenue (west of Seventh Street) to Seventh Street to permit recirculation of taxis, rental cars and airport operational users (travelling eastbound at ground level on Shiers Avenue).

4.2.3 Project 2 – P3 Expansion and link to P2

Three additional floors will be constructed on the P3 car park structure (see **Figures 4.5 and 4.14**) to mitigate the loss of parking when the eastern portion of the P1 parking structure is demolished. This extension will take the P3 structure to a total of nine above ground levels and provide an additional 430 bays whilst P1 East is being constructed. The internal layout of the additional three levels will be the

Figure 4.5 P3 car park – indicative floor layout for additional floors

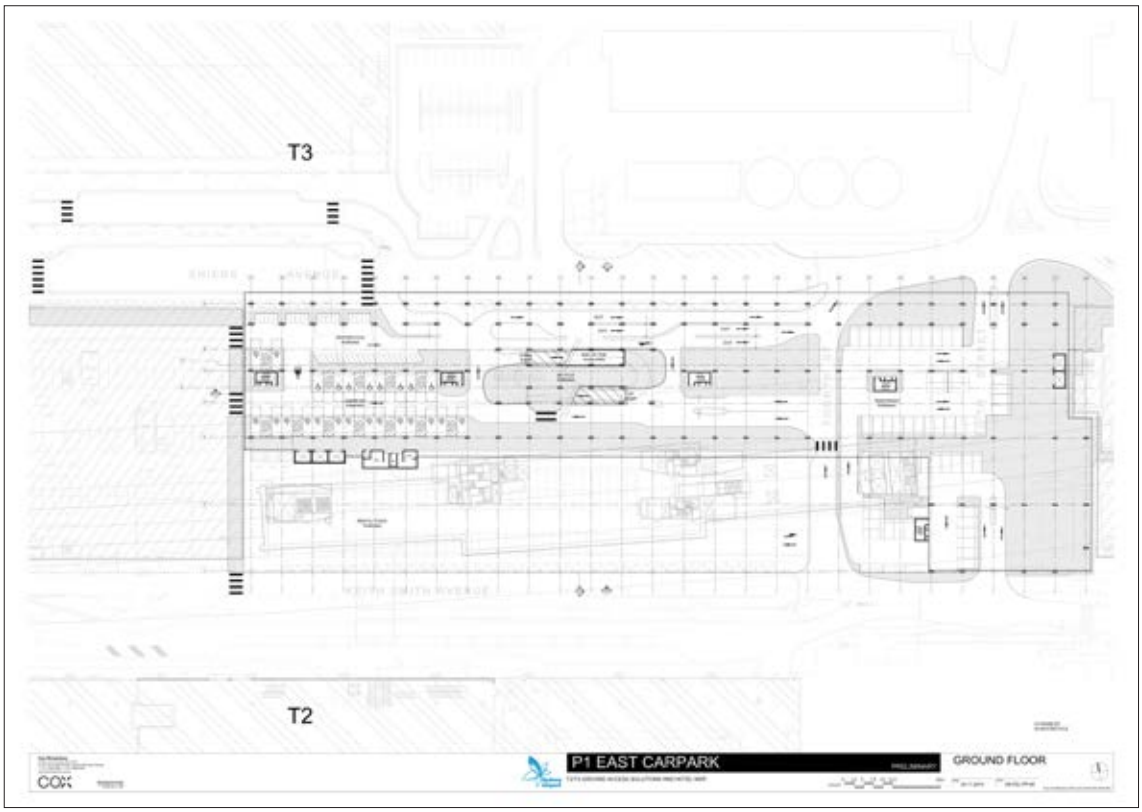


Source: Cox Richardson

Figure 4.6 Indicative view of P1 East and the pedestrian corridor (looking east)

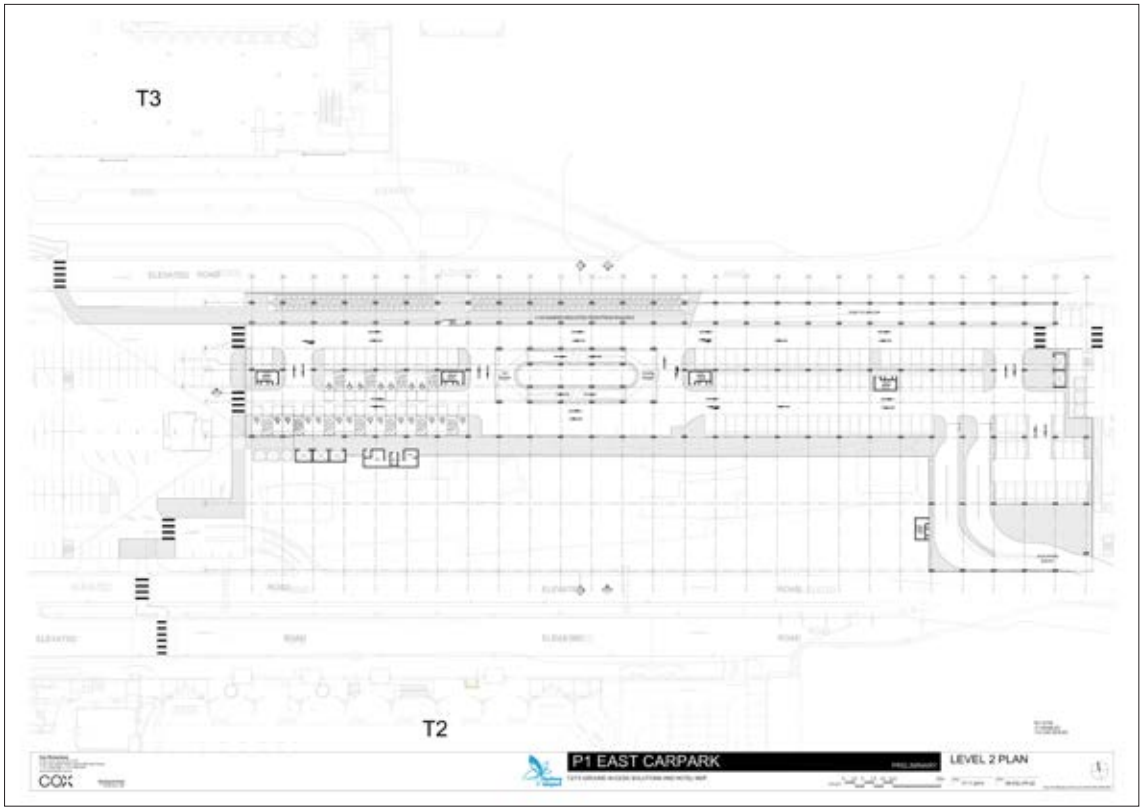
Source: Cox Richardson

Figure 4.7 P1 East car park – ground floor indicative layout



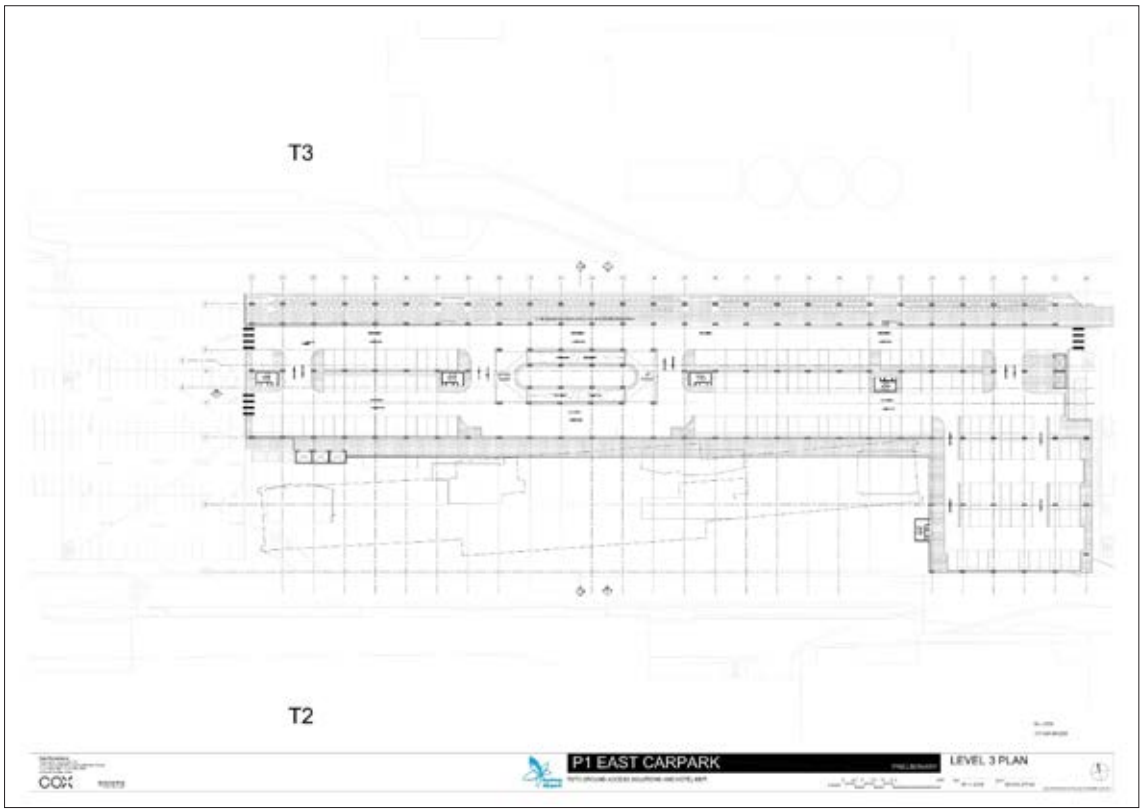
Source: Cox Richardson

Figure 4.8 P1 East car park – level 2 indicative floor layout



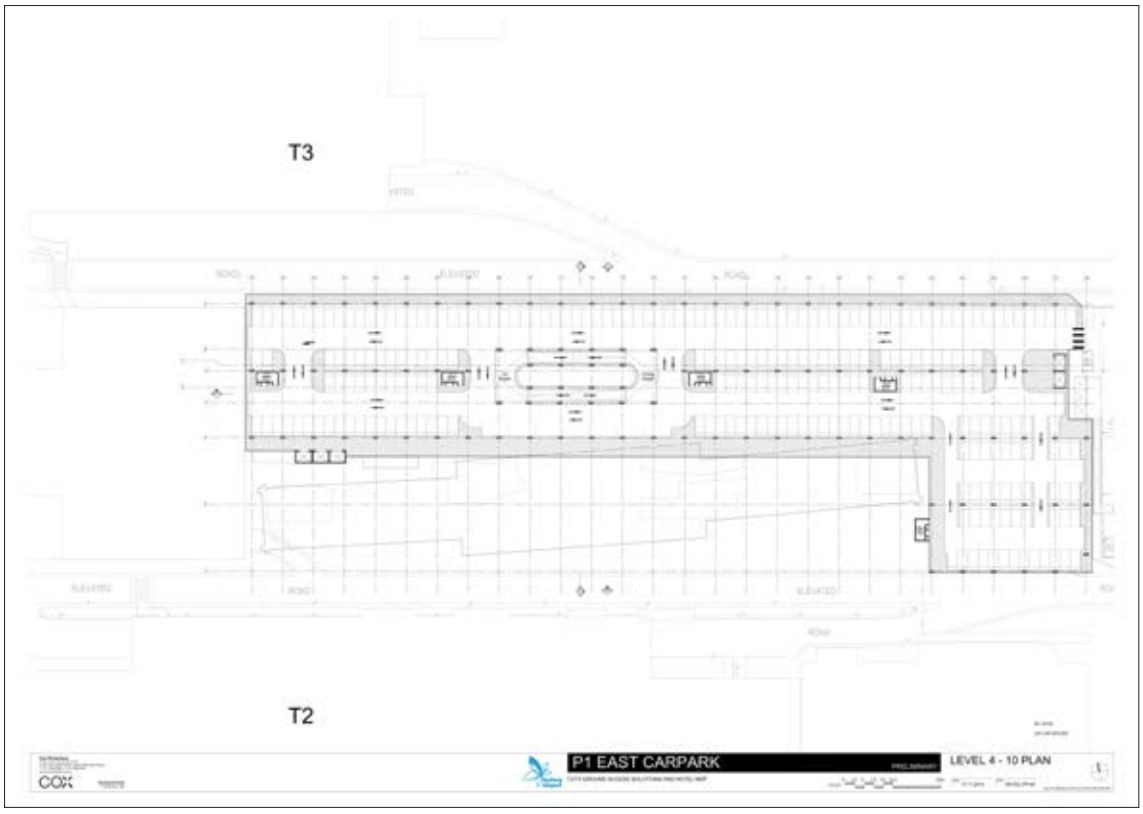
Source: Cox Richardson

Figure 4.9 P1 East car park – level 3 indicative floor layout



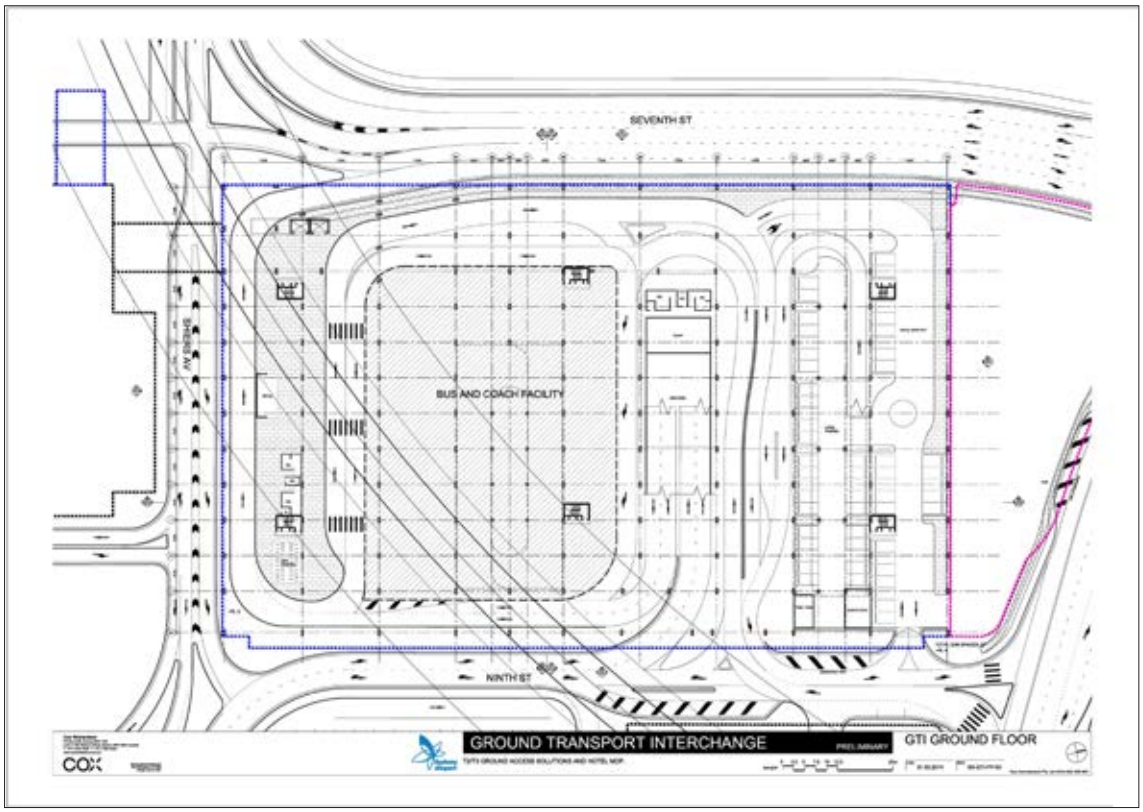
Source: Cox Richardson

Figure 4.10 P1 East car park – indicative floor layout for additional floors



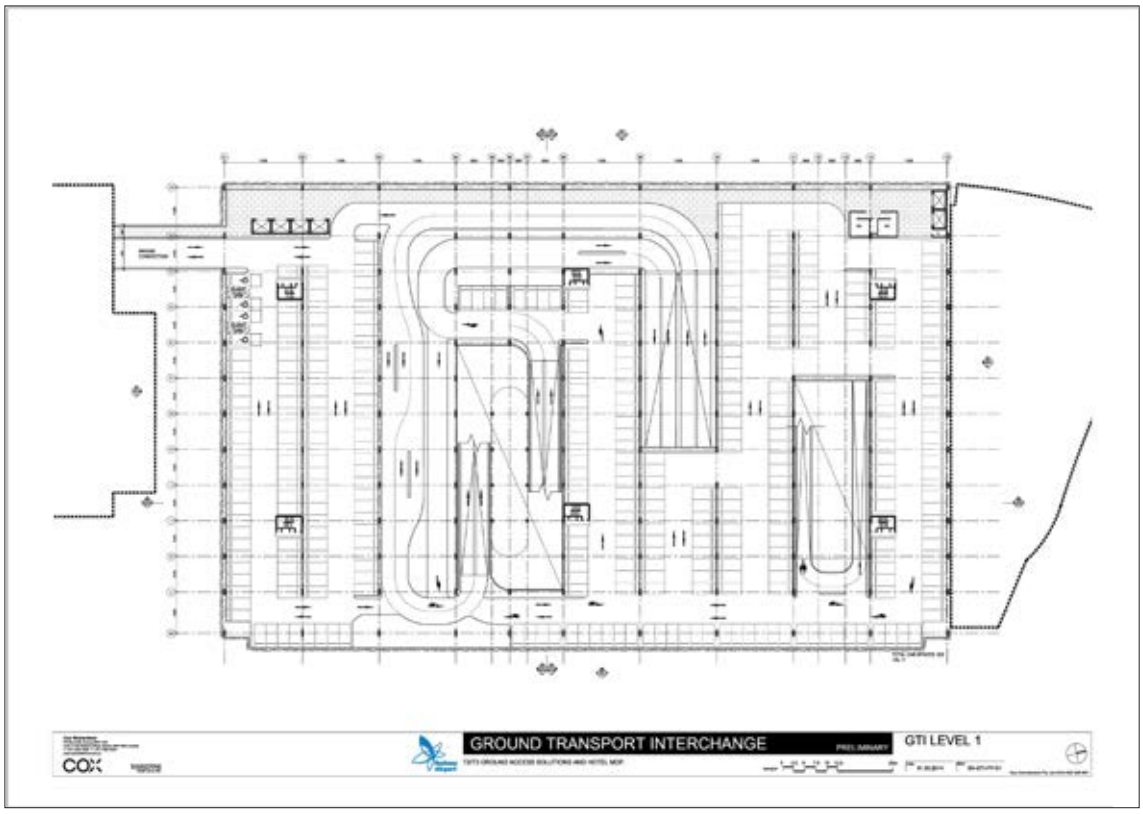
Source: Cox Richardson

Figure 4.11 Ground Transport Interchange – indicative ground floor layout[27]



Source: Cox Richardson

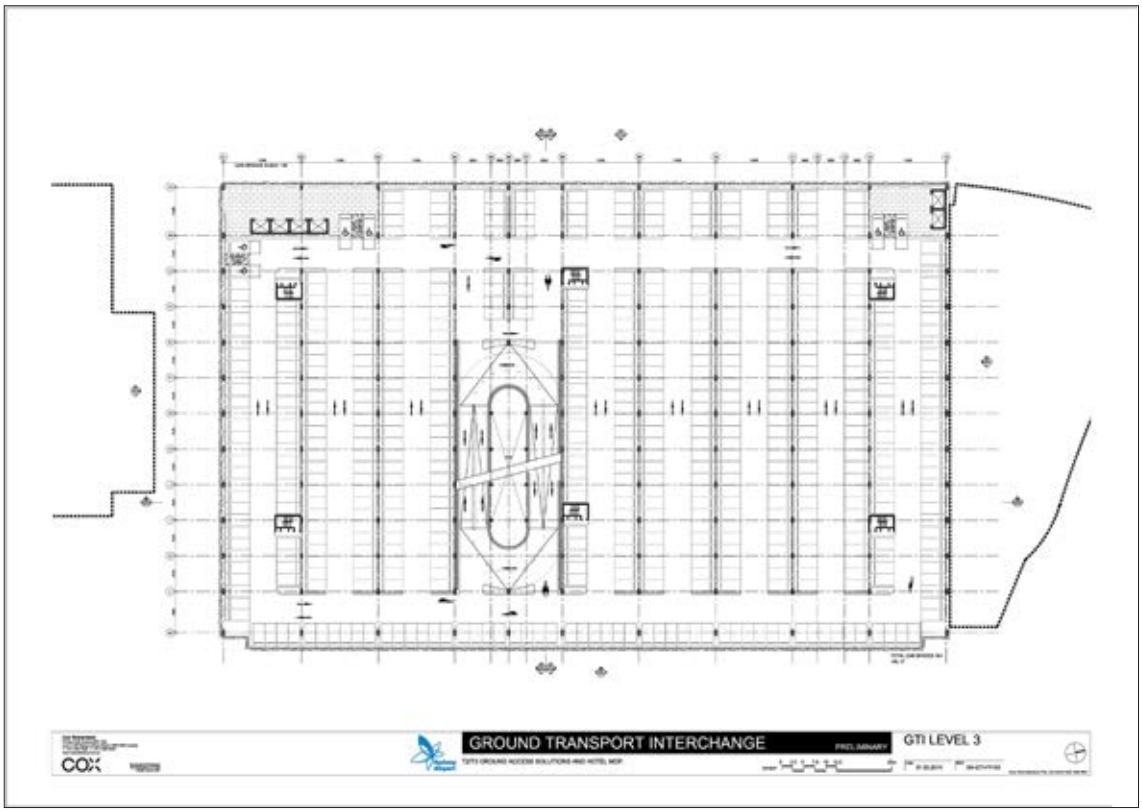
Figure 4.12 Ground Transport Interchange – indicative level 1 floor layout



Source: Cox Richardson

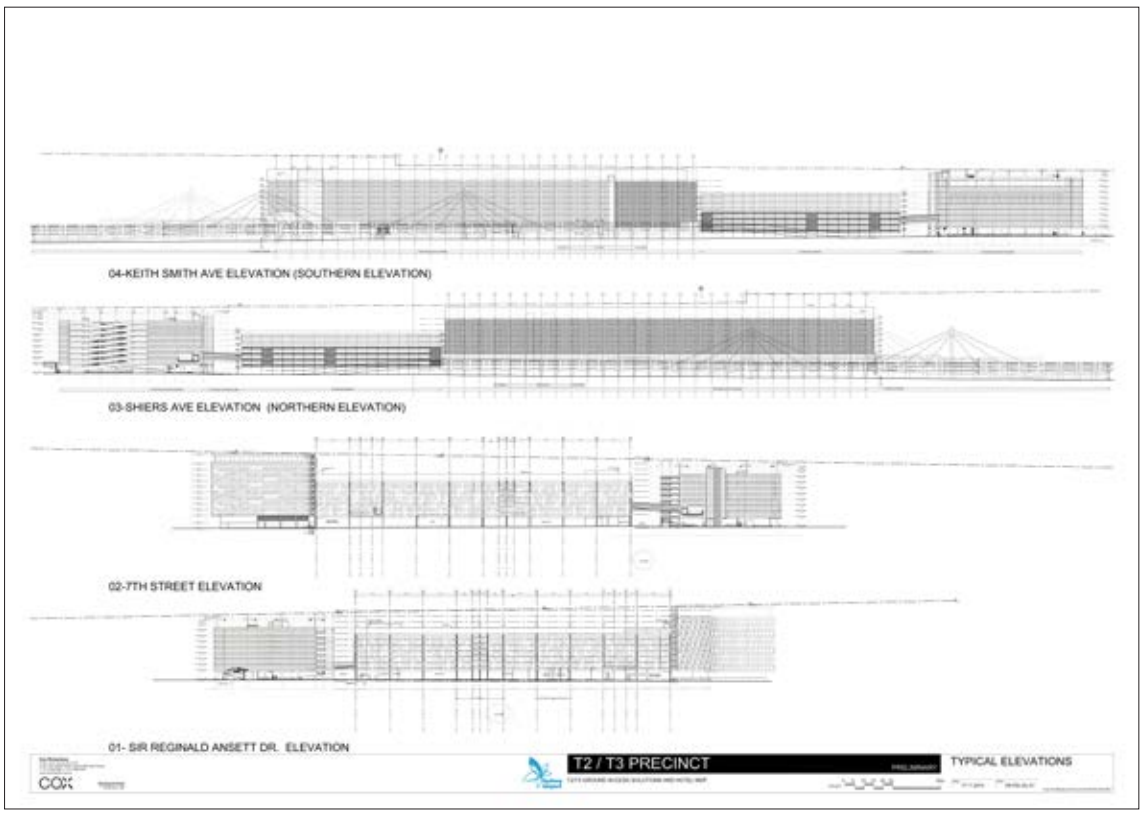
27 All concept design drawings are available for download from www.sydneyairport.com.au

Figure 4.13 Ground Transport Interchange – indicative typical floor layout



Source: Cox Richardson

Figure 4.14 Elevations – all structures



Source: Cox Richardson

Figure 4.15 Indicative view of bus and coach facility (looking north-west)

Source: Cox Richardson

same as the typical existing upper parking levels in P3. An additional lift will be added to P3 to service the extra levels.

A bridge over Seventh Street linking P3 to P2 will be constructed at approximately 6 metres above ground (Level 2). This bridge will contribute to the reduction in ground level traffic movements, improve the operation of P2 and P3 and provide part of the proposed above-ground pedestrian corridor that will link the Ground Transport Interchange and car parks to the terminals. An additional two bridge links are proposed in Project 4 between the Ground Transport Interchange and P3.

The bridges will result in a loss of 80 parking bays, so the net increase in capacity to the P3 structure of the proposed developments is approximately 350 bays.

In preparation for demolishing the existing P1 eastern structure additional lifts will be constructed on the western side of P2 to service all floors of P2 northern plates. These lifts will also serve the visitors parking on the eastern side of the proposed P1 East car park.

4.2.4 Project 3 – P1 East redevelopment

The eastern portion of the four level P1 car park will be demolished resulting in a loss of approximately 800 parking bays.

A new structure will be constructed on the P1 East site consisting of a ground level plus nine car parking levels providing approximately 2,050 parking bays (see **Figures 4.7 to 4.10 and 4.14**) – a net increase of 1,250 bays for this site. This structure will connect to the remaining P1 structure at Departures level to the west and to the level 3b northern plate of the P2 structure to the east.

Primary vehicle access to and from the new P1 East will be from Fourth Street. Additional vehicle entries will be available from the elevated section of Keith Smith Avenue adjacent to P2 and at grade from Shiers Avenue opposite T3. The primary exit from P1 East will be at Fourth Street with an alternative exit through P2.

An above ground pedestrian corridor will be provided on the northern side of P1 East connecting to P1 West at Departures level and connecting to P2 at level 3b. This corridor will be weather protected with assisted walkways in both directions for the length of the new structure. The pedestrian pathway in the remaining P1 and P2 structures will be upgraded to create the desired pedestrian experience between the car parks and the terminals.

P1 East will include information and way-finding systems that will assist people and vehicles to find their way efficiently in and around the facility. This will result in shorter travel times, improved customer experience and a reduction in vehicle emissions.

Provision is included in the concept design for disabled parking in accordance with BCA across P1 East and P2: 2 per cent for the first 1,000 spaces and 1 per cent for the remainder with easy access to the lifts on all levels.

Figure 4.16 Indicative view from Shiers Avenue of Ground Transport Interchange exit to Seventh Street (looking west)

Source: Cox Richardson

The floor to floor heights will be approximately 6 metres for the ground level and approximately 3 metres from levels 1 to 9. Multiple lifts serving all levels will be provided in the south-western and eastern ends of the structure along with public amenities.

Principles influencing the design of the proposed P1 East structure include:

- flat floors rather than sloping or split level floors which assists 'search patterns' for motorists looking for vacant spaces and pedestrian movements with luggage trolleys;
- wide span column grid providing for flexibility in circulation and parking configurations;
- provision for circulation ramps within the proposed structure to serve all levels efficiently;
- provision for vehicle and pedestrian circulation between P1 West, P1 East and P2, including vertical circulation;
- creation of an above ground pedestrian corridor to and from the terminals providing a safe, user-friendly experience reducing conflict with vehicle movements;
- end of trip bicycle/cyclist facilities; and
- other design considerations:
  - legible and safe pedestrian exit and access;
  - safe, efficient and legible vehicle circulation;
  - optimised parking and storage layout;
  - optimised structural grid efficiency;
  - easily identified and visually unobstructed lobbies;
  - adequate, appropriate and user friendly signage and way-finding;
  - external commercial signage opportunities on northern and southern facades;
  - architectural screening of facades on upper parking levels; and
  - natural ventilation.

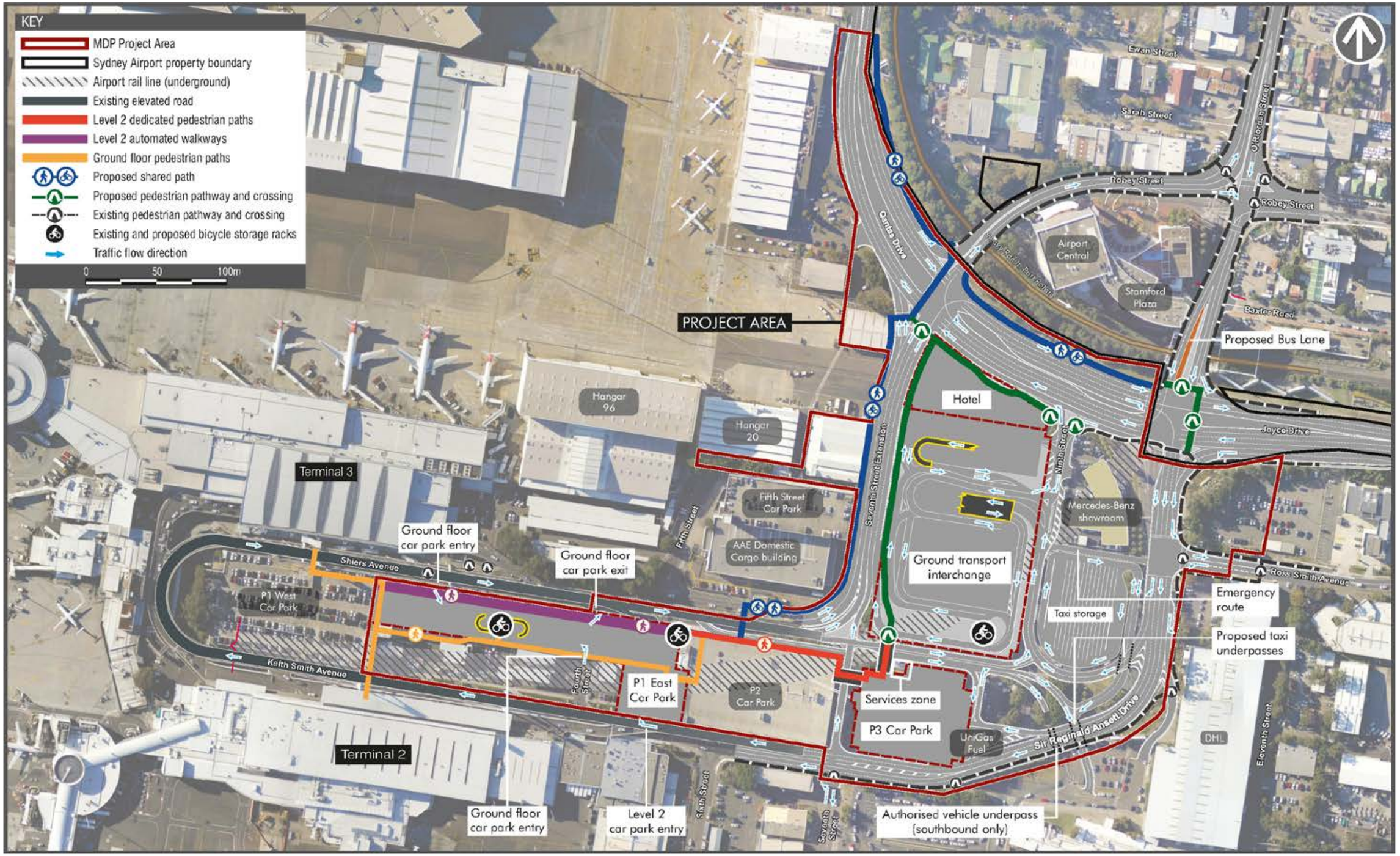
Pedestrian circulation

A primary objective of redeveloping the P1 East site is to improve the pedestrian experience between the terminals, the Ground Transport Interchange and other ground transport facilities.

P1 East will include an above ground pedestrian corridor on the northern side of the structure connecting to the existing P1 west at Departures level and connecting to P2 at level 3b (see **Figure 4.6**). This corridor will be weather protected and naturally ventilated with assisted walkways in both directions for the length of the new structure.

The existing ground level pathways will also be improved for convenience, amenity and safety of pedestrians and connect to the precinct shared path that terminates at Shiers Avenue.

Figure 4.17 Pedestrian and cycle network



Source: AECOM

Figure 4.17 (overleaf)

Figure 4.18 Indicative view of Sir Reginald Ansett Drive and Ross Smith Avenue intersection

Source: Cox Richardson

Bicycle network and facilities

As with pedestrians, cycling activity within and through the project area is currently largely related to staff commuting and accessing bicycle facilities currently provided adjacent to the P2 structure. Sydney Airport acknowledges the growing demand for bicycle access and facilities from the general public and passengers in the terminal precinct.

End of trip facilities for cyclists and bicycle storage will be included on the ground level (see **Figure 4.17**) of the new P1 East structure. The existing bicycle storage racks adjacent to P2 will also be retained. Cyclist can enter and exit the precinct on the proposed shared path alongside Seventh Street extension that will terminate at Shiers Avenue. For pedestrian and passenger safety, cyclists will be requested to dismount at the Shiers Avenue crossing and continue further into the precinct on foot.

In addition to improved shared path links planned as part of the proposed development, other facilities to promote cycling will include:

- undercover bicycle racks located near public areas within P1 East to provide storage for at least 30 bicycles which may expand based on demand; and
- end-of-trip facilities and amenities such as lockers and bathrooms which can be located under internal ramps.

Road configuration

Primary vehicle access to and from the new P1 East will be from Fourth Street. Additional vehicle entries will be available from the elevated section of Keith Smith Avenue adjacent to P2 and at grade from Shiers Avenue opposite T3. The primary exit from P1 East will be at Fourth Street with an alternative exit through P2.

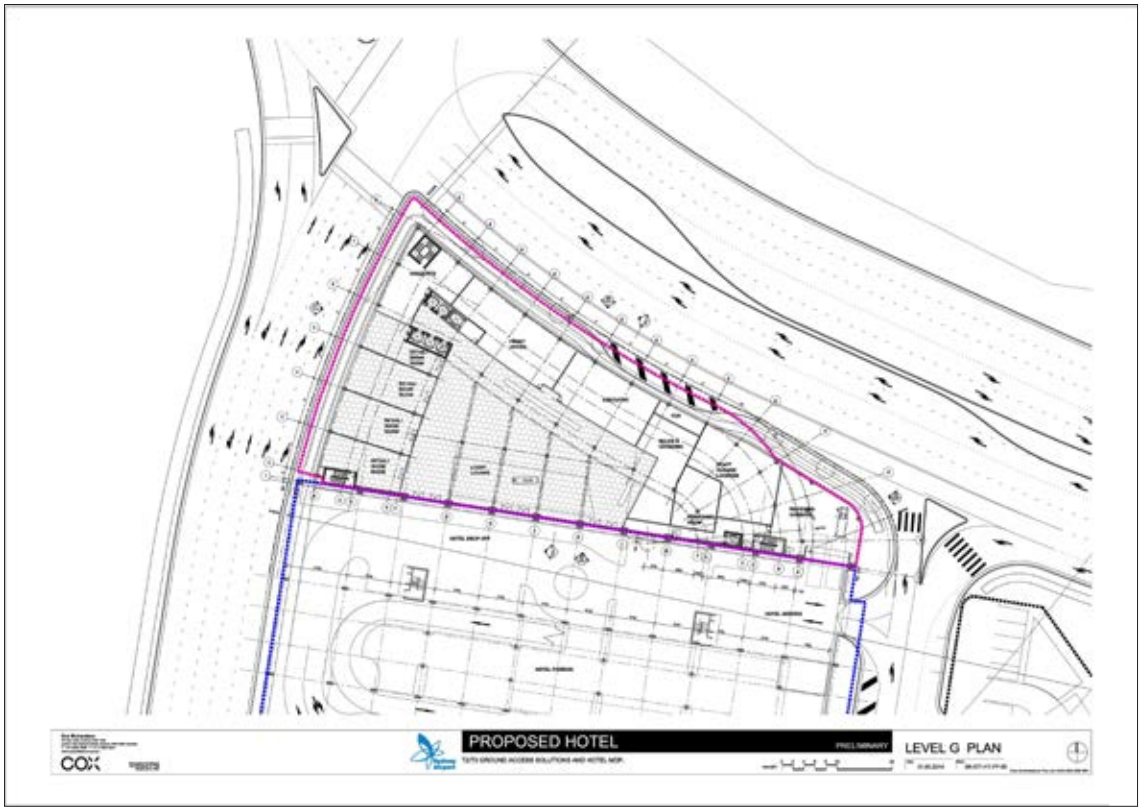
4.2.5 Project 4 – Ground Transport Interchange

The Ground Transport Interchange, a double-height ground plus seven level structure will be located on a site of approximately 16,000 square metres bounded by Ninth Street to the east, Shiers Avenue to the south, the Seventh Street extension to the west, and the proposed hotel to the north. Plans, elevations and sections of the proposed Ground Transport Interchange concept design are provided in **Figures 4.11 to 4.14**.

The Ground Transport Interchange will include information and way-finding systems that will assist people and vehicles to find their way efficiently in and around the facility. This will result in shorter travel times, improved customer experience and a reduction in vehicle emissions.

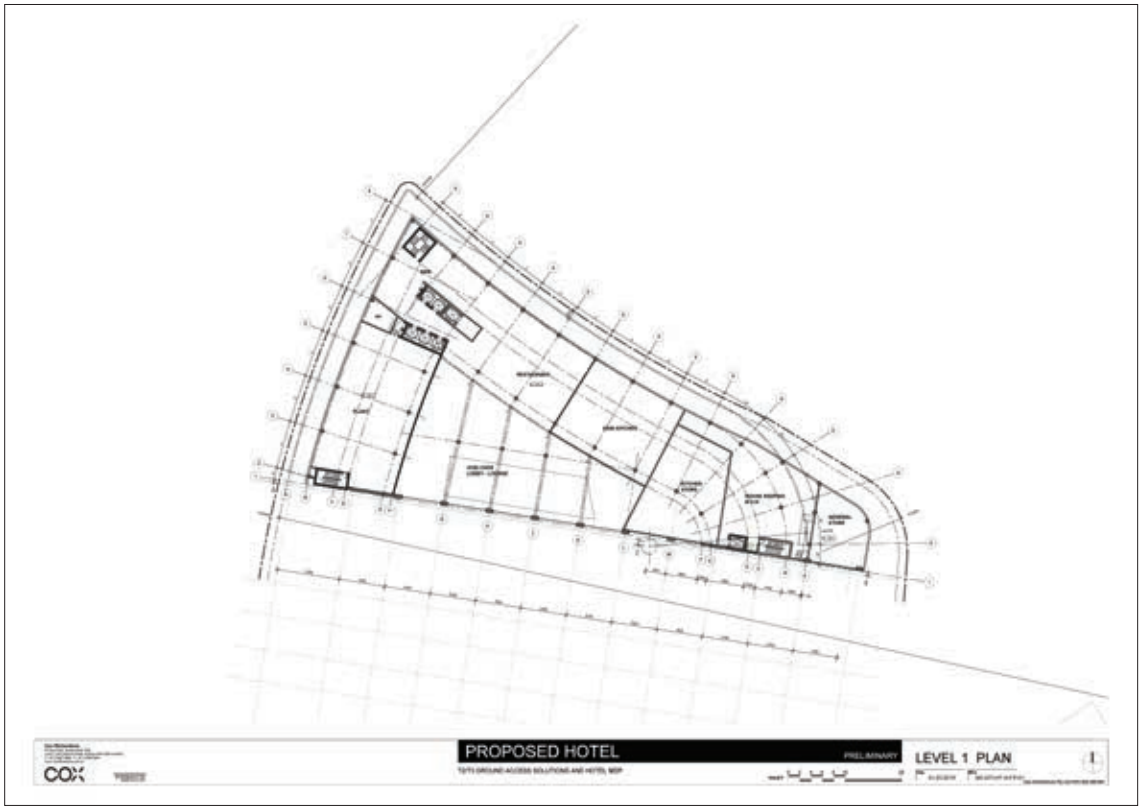
This structure will be constructed to accommodate the operation of a ground level bus and coach drop-off and pick-up facility (see **Figure 4.11**) and multi-modal parking

Figure 4.19 Hotel – indicative ground floor layout



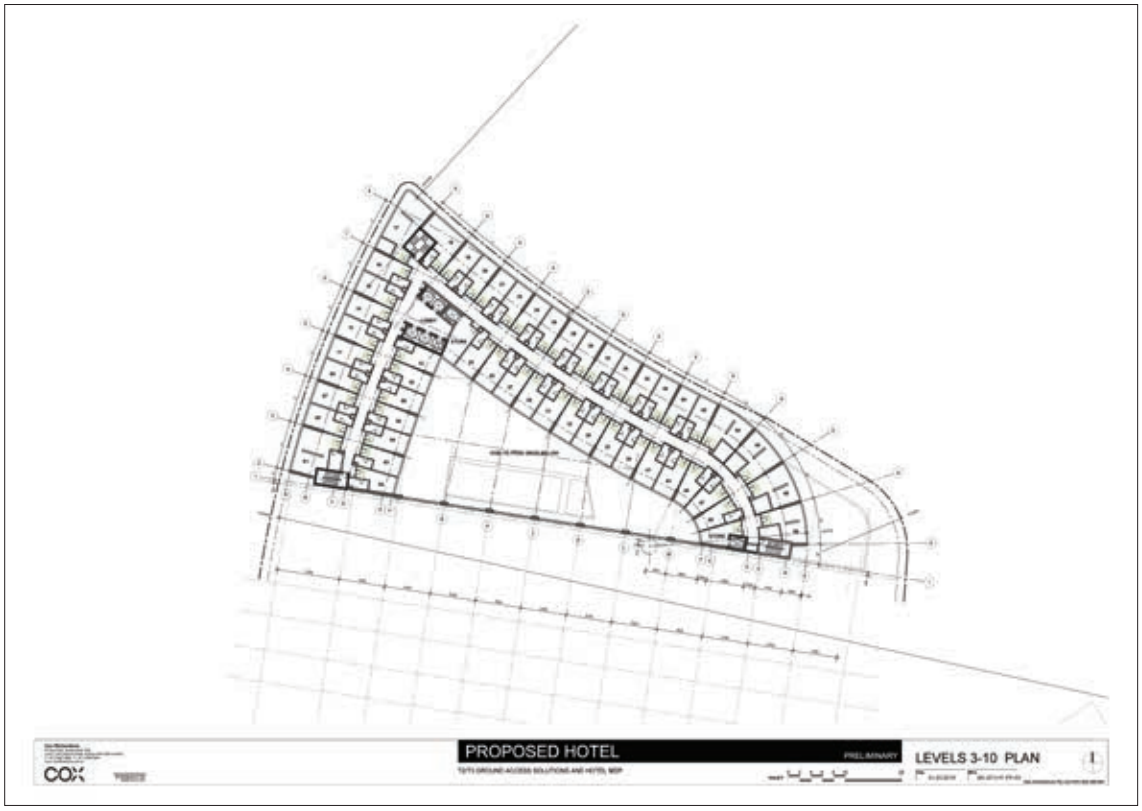
Source: Cox Richardson

Figure 4.20 Hotel – indicative level 1 floor layout



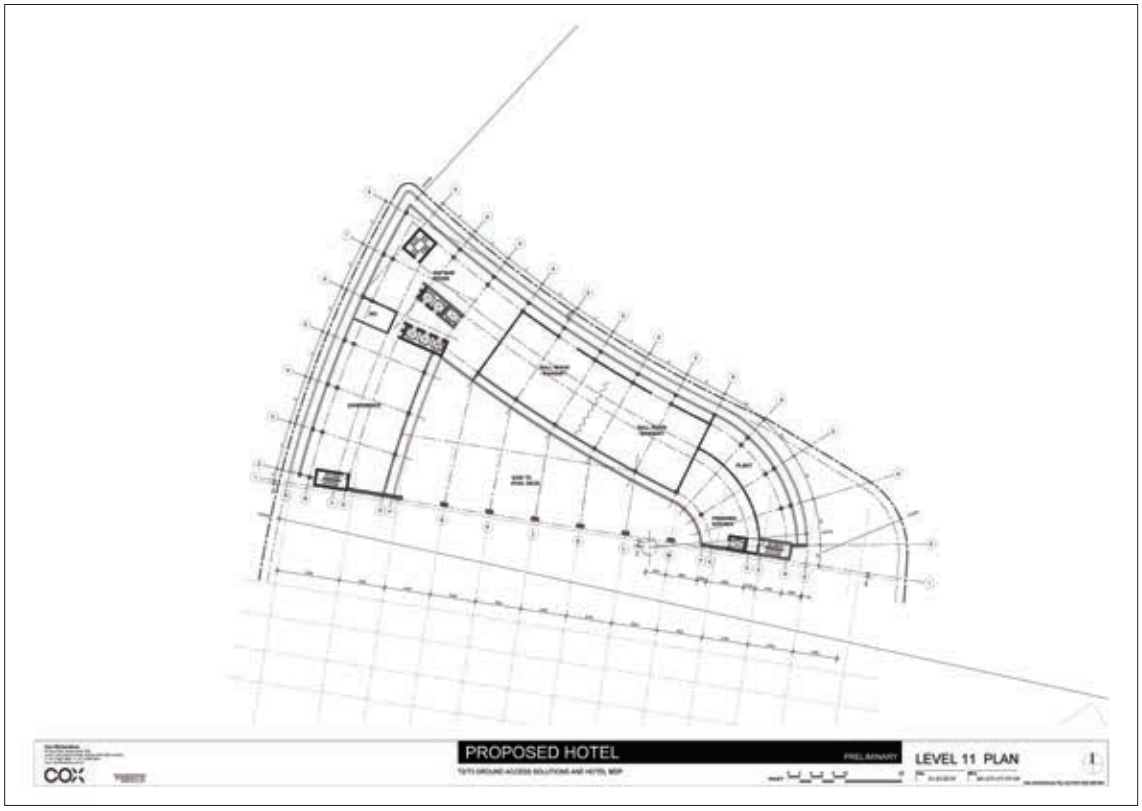
Source: Cox Richardson

Figure 4.21 Hotel – indicative typical floor layout



Source: Cox Richardson

Figure 4.22 Hotel – indicative top floor layout



Source: Cox Richardson

and storage for approximately 4,000 vehicles with access and exit control at ground level. Provision is included in the concept design for disabled parking in accordance with BCA: 2 per cent for the first 1,000 spaces and 1 per cent for the remainder; with easy access to the lifts on all levels. Potential services to be accommodated in the Ground Transport Interchange include vehicle storage of valet cars, public/ hotel parking, a rental car quick turnaround (wash, vacuum and refuel) and storage facility and the porte cochere of the adjoining hotel (Project 7).

The floor to floor heights will be approximately 6 metres for the ground level bus and coach facility and approximately 3 metres from levels 1 to 7. Multiple lifts serving all levels will be provided in the south-western and north-western corners of the structure along with public amenities and a pump room.

Principles influencing the design of the proposed Ground Transport Interchange structure include:

- flat floors rather than sloping or split level floors which assists 'search patterns' for motorists looking for vacant spaces and pedestrian movements with luggage trolleys;
- wide span column grid providing for flexibility in circulation and parking configurations;
- provision for high capacity circulation ramps within the proposed structure to serve all levels efficiently;
- provision for above-ground vehicle and pedestrian links from the Ground Transport Interchange to connect to T2 and T3 via the recently completed P3 structure at levels 1 and 3 and then westwards from P3 to P2. This driveway and walkway system will provide links between all parking structures and both terminals and will permit flexibility of service configuration;
- pedestrians will have access to and from T2 and T3 using an above-ground corridor providing a safe, user-friendly experience with weather protection elements;
- end of trip bicycle/cyclist facilities; and
- other design considerations:
  - legible and safe pedestrian exit and access;
  - safe, efficient and legible vehicle circulation;
  - optimised parking and storage layout;
  - optimised structural grid efficiency;
  - easily identified and visually unobstructed lobby;
  - adequate, appropriate and user friendly signage and way-finding;
  - external commercial signage opportunities on eastern, western and southern facades;
  - architectural screening of facades on upper parking levels;
  - natural ventilation along the eastern, southern and western facades; and

Bus and coach facility

Platforms and lanes will be provided with flexibility for vehicle use and safe passenger loading and unloading, including the recently introduced double-decker public buses. Some limited retail space will be included in the facility to meet the immediate needs of bus and coach travellers such as the purchase of drinks and snacks (see **Figure 4.15**).

Adjacent to the bus and coach facility will be a lift core to carry pedestrians and passengers to Level 1 where they can continue along the above-ground pedestrian corridor safely to T2, T3 and the rail station.

As shown on **Figure 4.3**, buses and coaches will approach and enter the Ground Transport Interchange from either Ninth Street or Sir Reginald Ansett Drive. Buses and coaches will exit either to the Seventh Street extension (see **Figure 4.16**) for destinations to the north and east or via Ninth Street for destinations to the west.

Pedestrian circulation

Currently, given the existing aviation support and commercial activities in the site area, pedestrian activity in and through the site area is generally limited to staff movements rather than passenger movements.

Improvements to the pedestrian experience in the north-east precinct (**Figure 4.17**) will be implemented progressively as a result of the proposed development and future development consistent with the recently approved Master Plan 2033. Within the proposed development footprint, planned improvements include: Within the proposed development footprint, planned improvements include:

- pedestrian and shared path thoroughfares;
- pram ramps to facilitate the movement of wheeled baggage, trolleys and prams;
- lifts to all levels of both the Ground Transport Interchange and the hotel; and
- connections to pathways within the precinct and the wider external pathway network beyond the airport boundary.

Works to improve the convenience, amenity and safety of pedestrians (although not part of this major airport development) are currently in planning to provide an elevated direct link from the terminals and rail network to parking and pick-up facilities within the T2/T3 precinct.

Bicycle network and facilities

As with pedestrians, cycling activity within and through the project area is currently largely related to staff commuting and access to bicycle facilities provided adjacent to the P2 structure.

Sydney Airport supports increased connectivity of the regional shared path networks through the airport precinct to enhance access to the proposed improved shared path links.

The development of a comprehensive cycle network is supported by Sydney Airport. Transport for NSW' 'Sydney's Cycling Future' highlights the need for east, west and northern connections to and from the airport, and Sydney Airport will continue to work with local government and state agencies to connect existing on and off airport shared paths.

In addition to improved shared path links planned as part of the proposed development, other facilities to promote cycling will include:

- undercover bicycle racks located near public areas within the Ground Transport Interchange to provide storage for at least 50 bicycles which can be expanded based on demand; and
- end-of-trip facilities and amenities such as lockers and bathrooms which can be located under internal ramps.

Road configuration

Ninth Street will be reconfigured with northbound only vehicle movements in the southern section for access to the Ground Transport Interchange, and two way movements in the northern section. The intersection of Ninth Street and Qantas Drive will be upgraded to better accommodate public bus movements.

4.2.6 Project 5 – Reconfiguration of Sir Reginald Ansett Drive and Shiers Avenue

Once the Ground Transport Interchange is constructed, the following works will be undertaken to Sir Reginald Ansett Drive and Shiers Avenue (see **Figure 4.18**):

- reconfiguration of Sir Reginald Ansett Drive to a one-way inbound (southbound) to the T2/T3 precinct;
- extension of left turn lanes into Sir Reginald Ansett Drive;
- conversion of part of the eastern end of Shiers Avenue to one-way westbound from Sir Reginald Ansett Drive to Ninth Street to facilitate access to the new Ground Transport Interchange; and
- realignment of the Shiers Avenue/Ninth Street intersection to permit eastbound traffic on Shiers Avenue to access the Ground Transport Interchange and the hotel along Ninth Street.

Taxis

A portion of Shiers Avenue will be retained for use by, among others, taxis for recirculating to the taxi holding facility east of Ninth Street after dropping off passengers at the terminal frontage on Departures Road. The existing taxi underpass of Sir Reginald Ansett Drive will be used for rental car recirculation. New double lane taxi underpasses are proposed under Sir Reginald Ansett Drive and the eastern end of Shiers Avenue to provide increased recirculation capacity for taxis to an additional storage area south of the Mercedes-Benz site and the existing storage site south of Keith Smith Avenue.

4.2.6 Project 6 – Qantas Drive

To provide increased capacity on Qantas Drive to complement other on-airport and proposed off-airport works (see Chapter 5), the following works will be undertaken:

- augmentation of Qantas Drive (north side) to provide three eastbound through lanes and associated turning lanes;
- augmentation of Qantas Drive (south side) to provide three westbound through lanes and associated turning lanes. An 'audible strip' is proposed between the southernmost westbound lanes on Qantas Drive to prevent north or eastbound vehicles using the Ninth Street exit to access Robey Street;
- reconfiguration of the Qantas Drive/Robey Street intersection to enable northbound traffic access from Seventh Street extension and Qantas Drive (westbound) to Robey Street;
- inclusion of pedestrian and cycle crossings on the western arm of the Qantas Drive/Robey Street intersection to provide a direct connection between the precinct and the pathways on Qantas Drive and Robey Street; and
- subject to off-airport agencies/councils confirming proposed cycle network connections, a shared path between Robey Street and O'Riordan Street on the north side of Qantas Drive would be included in designs.

4.2.8 Project 7 – Proposed hotel

To meet the demand from airline passengers it is proposed to develop a 4 to 5 star hotel with approximately 430 rooms. The site area for the proposed hotel will be up to 3,000 square metres located immediately north of the Ground Transport Interchange.

The hotel concept design includes an integrated ground plus 11 level building of approximately 27,000 square metres gross floor area (GFA) of commercial floor space for hotel and other service facilities, including a retail component of approximately 500 square metres net lettable area (NLA). A portion of the roof top level not occupied by lift overruns or other service facilities will be used for indoor and outdoor conference and lounge activities - similar to the use of the rooftop area of the Rydges Hotel adjacent to T1 at the airport. Plans, elevations and sections of the concept design for the proposed hotel are provided in **Figure 4.14 and Figures 4.19 to 4.22**.

It is anticipated that the hotel will be of 4 to 5 star standard with approximately 430 rooms. At the lower levels the amenities may include reception, dining and bar facilities, swimming pool/fitness centre and conference and meeting rooms.

The typical floor to floor height for guest room floors will be approximately 3 metres. The typical upper floor layout (levels 2 to 10) will feature double-loaded corridors with approximately 50 rooms per floor. The top level will provide conference and meeting room facilities.

Vehicle and pedestrian access to the proposed hotel will be via a porte cochere and dock access, as appropriate, from Ninth Street and, subject to design, in conjunction with access arrangements for the adjacent Ground Transport Interchange. Car parking demand generated by this commercial development will be satisfied within the adjacent parking structures.

The proposed hotel will be operated by an experienced hotel operator and will provide a range of services to meet the expectations of airport customers and passengers.

The concept design for the proposed hotel assessed in this MDP will be subject to detail design within the parameters of the MDP approval.

4.2.8 Materials and finishes

The materials and finishes proposed for the development are as follows:

Ground Transport Interchange, P1 East and additional P3 levels

- Walls (external): anodized aluminium mesh/perforated cladding or similar – designed to permit natural ventilation
- Floors: post-tensioned reinforced concrete slab

Hotel

- Roof: pre-finished metal roof sheeting above a post-tensioned reinforced concrete slab indoor and conference and lounge and the like. Part of the roof may also involve a roof garden space or "green roof" as considered in Section 8.3.3
- Walls (external): reinforced concrete, prefabricated panel systems and glass
- the inclusion of noise mitigation measures in the design and selection of building materials to meet Australian Standards within the proposed hotel

4.2.9 Equity of access

Within the proposed development, provision for mobility-impaired people compliant with the *Disability Discrimination Act 1992* (Cwth) will include:

- at grade access to the Ground Transport Interchange, P1 East and the hotel;
- disabled persons toilets;
- lifts in accordance with AS 1428 – 2010 Design for Access and Mobility and AS 1735:17 Lifts, Escalators and Moving Walks;
- mobility parking to be provided within the Ground Transport Interchange and P1 East adjacent to the lifts in accordance with AS 2890.6 – Accessible (Disabled) Parking;
- generally uniform floor level throughout the interior of the development;
- level above-ground access to T2, T3 and Domestic train station; and
- at grade access to bus stops and taxi area.

4.3 Building services and facilities

The building services and facilities required by the proposed development are discussed below and reflect Sydney Airport's consultation with relevant service providers.

4.3.1 Power supply/electricity

The proposed development will be supplied with electric power adequate to supply all building, lighting and other services. An on-site stand-by generator with sufficient capacity to ensure essential services will be provided for the hotel subject to the hotel operator's requirements. The potential for sustainability initiatives such as co-generation and solar power will be considered during detailed design (see Section 4.4).

4.3.2 Water supply

Adequate supplies from Sydney Water are readily available through the airport's reticulation system, which has the ability to supply the necessary demand from the proposed development.

4.3.3 Waste water and sewage disposal

The proposed development will be connected to the existing waste water and sewage reticulation systems in the north-east precinct. These systems have the ability to satisfy the necessary requirements. Future provision of T2/T3 precinct sewerage pump station and reticulation infrastructure has been considered in the design of the proposed development.

The potential to incorporate water reuse initiatives into the proposed buildings will be considered during detailed design (see Section 4.4).

4.3.4 Telecommunications/data

The Ground Transport Interchange and car park redevelopments may include telecommunications and network technologies to support various customer information and way-finding services such as parking guidance systems with advance notice of floor availability

and capacity, real-time bus route information and other passenger-relevant data. The hotel will incorporate current telecommunications technologies, including the ability for fibre optics communication/data transmission.

4.3.5 Lighting

The internal lighting of the proposed Ground Transport Interchange, bus/coach facility, P1 East redevelopment and P3 extension and the pedestrian corridor will be designed to satisfy the requirements of AS1680.2.1-1993 Interior Lighting – Circulation Spaces and Other General Areas and AS1428.2-1992 Design for Access and Mobility – Enhanced and Additional Requirements – Buildings and Facilities. The average minimum maintained illumination is to generally exceed the recommendations of AS1680.2. Car park lighting controls will be designed to operate in two modes – day time mode and night time mode – and will be automatically controlled to switch between these two modes.

General external lighting of the proposed Ground Transport Interchange, P1 East and the hotel will be provided for all pedestrian areas around the perimeter of the buildings in accordance with the appropriate level in AS/NZS 1158:2007 Lighting for Roads and Public Spaces. All external lighting will also comply with the Civil Aviation Safety Authority's (CASA) requirements set out in *Manual of Standards, Part 139 Aerodromes, Chapter 9 Aerodrome Lighting – Lighting in the Vicinity of Airports*[28].

4.3.6 Heating, ventilation and air conditioning

The Ground Transport Interchange and the P1 East redevelopment and P3 extension will not be air conditioned or mechanically ventilated because the facades and open central core will be designed to allow for natural ventilation. The hotel will incorporate an energy-efficient air-conditioning system consistent with hotel use.

4.3.7 Fire protection and safety

Fire protection, monitoring and safety systems will be provided in accordance with Building Code of Australia (BCA) requirements and relevant Australian Standards. The provision of sprinklers will be subject to BCA requirements.

All levels of the hotel will have a sprinkler system and the fire alarm system will be integrated into the central building equipment monitoring and security system.

4.3.8 Lifts

Separate lift systems will serve the Ground Transport Interchange and the hotel. Multiple lifts located in multiple locations will serve all the levels in the Ground Transport Interchange, P2, and P3 to facilitate movement of pedestrians with luggage trolleys.

The hotel will have high quality passenger lifts with goods capacity provided.

4.3.9 Security

Within the Ground Transport Interchange and the new and redeveloped car parking structures, provision will be made for the installation of monitoring systems such as vehicle counters, dynamic module/floor capacity signage, CCTV, and duress alarms. The CCTV network will ensure key publicly accessible areas of the Ground Transport Interchange and P1 East redevelopment, such as the bus stops, bicycle facilities and amenities are monitored.

Security protection for the hotel will be an integrated building system and will be maintained on a 24 hour basis. Security requirements of the hotel operator will be accommodated during detailed design.

4.4 Sustainability

As noted in the recently approved Master Plan 2033 and the Environment Strategy 2013-2018, sustainability – responsible growth through balancing community and environmental needs with corporate objectives – is a core commitment by Sydney Airport.

The specifications for the proposed T2/T3 Ground Access Solutions and Hotel will require, as appropriate, that the design, construction and operation of the proposed works incorporate a range of sustainability initiatives.

4.4.1 New or improved ground access

The new or upgraded roadways and related areas will consider provision for the following sustainability initiatives:

- LED for overhead lighting on roadways and way-finding;
- solar LED for overhead lighting on roadways and way-finding;
- permeable/pervious pavements in at-grade parking and verge areas;
- vehicle idling awareness signage;
- use of recycled materials in pavements;
- use of locally sourced materials; and
- use of real-time information displays for efficient way-finding and thus reduced vehicle emissions.

4.4.2 Ground Transport Interchange and redeveloped car parking structures

The specification for the proposed Ground Transport Interchange and the P1 East redevelopment and P3 extension, as appropriate, will consider in the design of the building the following sustainability initiatives:

Siting/design

- walkways or pedestrian paths to link site destinations;
- routes with easy gradients for pedestrian movement;

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- building orientation for passive solar gains/losses and ventilation; and
- minimise disturbance to existing conditions, for example, limit site disturbance.

Energy

- orientate the building to optimise day lighting and natural cooling by prevailing winds;
- use of LED lamps for lighting;
- alternative power sources where appropriate, for example, solar powered lighting on roof level;
- minimise energy consumption, use natural ventilation and consider energy efficient product selections where possible;
- light-coloured ceilings to minimise use of electric lighting;
- use of photovoltaic cells without compromising aviation safety; and
- drip-feed electric vehicle recharge points in parking and vehicle storage areas.

Solar access

- building form with respect to maximising solar access internally and externally;
- solar access to pedestrian areas at street level; and
- orientate building to optimise passive solar heating and day lighting.

Water

- vegetated buffers to treat and minimise stormwater run-off from car park;
- use of harvested (not potable) water for irrigation of plants and toilet flushing;
- use of drip irrigation systems instead of spray irrigation;
- use of timers for irrigation, with override sensors; and
- dual water supply installation for connection of future recycled water system, including connection of toilet flushing and hose taps for car park wash down.

Ventilation

- encourage natural ventilation of the building through proper building siting and orientation; and
- use of perforated facades and an open central core for natural ventilation.

Air quality

- legible, user friendly car park circulation and parking guidance systems to minimise unwanted emissions from vehicles unnecessarily recirculating within the car park; and
- install taxi and bus idling signage in ground level.

Materials

- modular design and demountability/recyclability to minimise waste;
- materials that are durable, low maintenance and recyclable;
- levels of finish and quality to minimise maintenance/replacement;
- use of materials and building assemblies with low embodied energy where possible; and
- locally manufactured building materials where possible.

The specifications for the proposed Ground Transport Interchange, the P1 East redevelopment and the P3 extension will require that the contractor considers the following material alternatives to improve building sustainability through the use of recycled material in concrete production:

- replacing at least 20 per cent of the total aggregate content in the concrete with recycled aggregate; and
- replacing at least 20 per cent of the total cement content in the concrete with industrial waste. The contractor will provide details of the industrial waste product which will be used. This might include but not be limited to silica fume, fly ash or steel slag.

4.4.3 Hotel

The design, construction and operation of the proposed hotel and related retail facilities will consider, as appropriate, the following sustainability initiatives as well as any precinct-wide initiatives proposed in the Master Plan 2033, such as a recycled water treatment plant.

Orientation and layout

- orientation of the building – north-facing facade facilitates solar access and regulates heat gain;
- external louvre screens in rooms to regulate solar gain;
- glazed façade in habitable rooms to provide natural lighting; and
- high occupation capacity to floor space ratio will result in low overall energy use per guest per room.

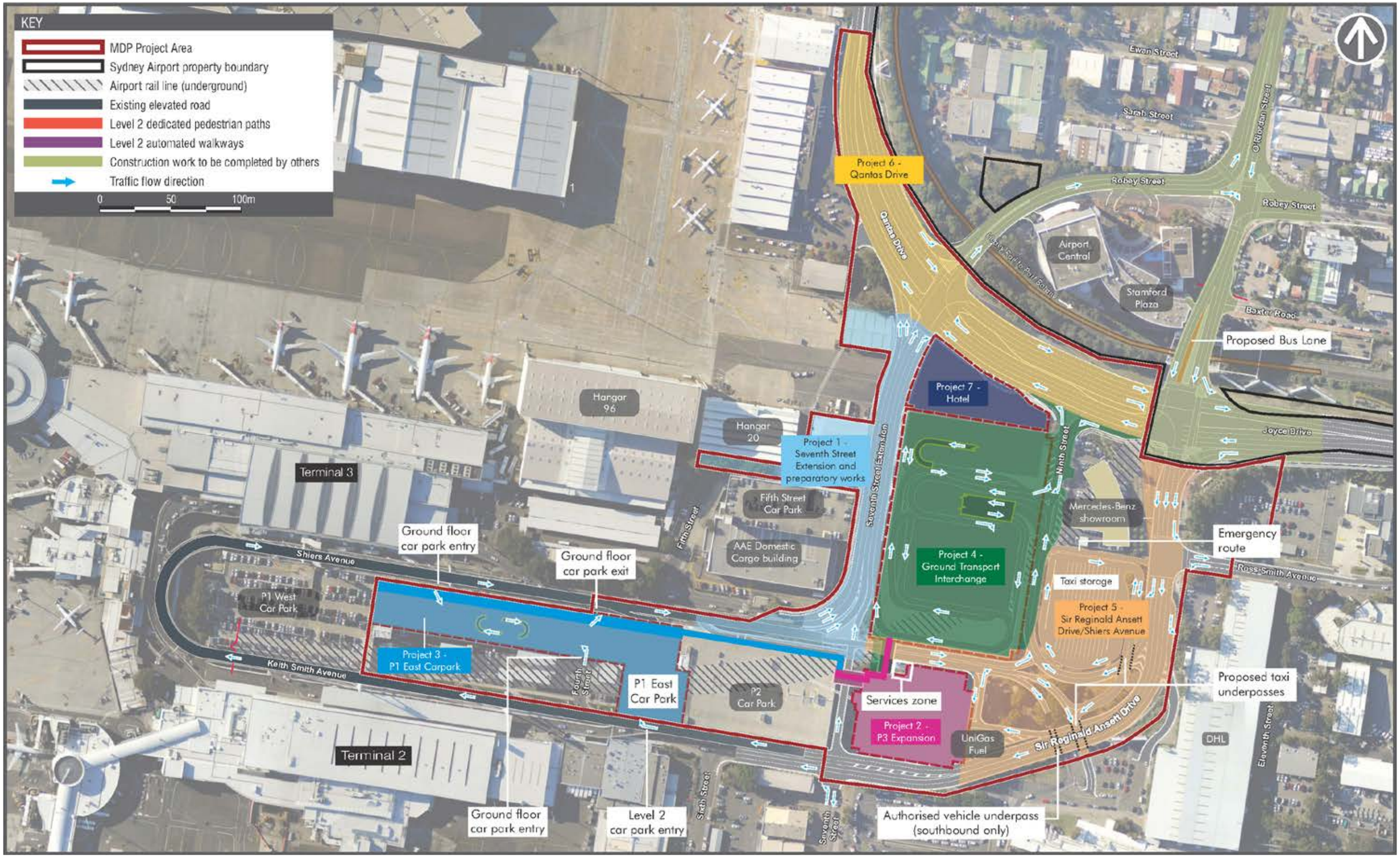
Energy

- energy efficient products, especially lighting where possible – for example, use of LEDs and timer controls and motion detectors where appropriate; and
- use of double glazing for energy efficiency and noise attenuation.

Water

- the design of the hotel would allow for connection to any future recycled water system;
- rainwater collection from roof for use in landscaping;
- water-saving devices and appliances in bathroom and kitchen areas; and

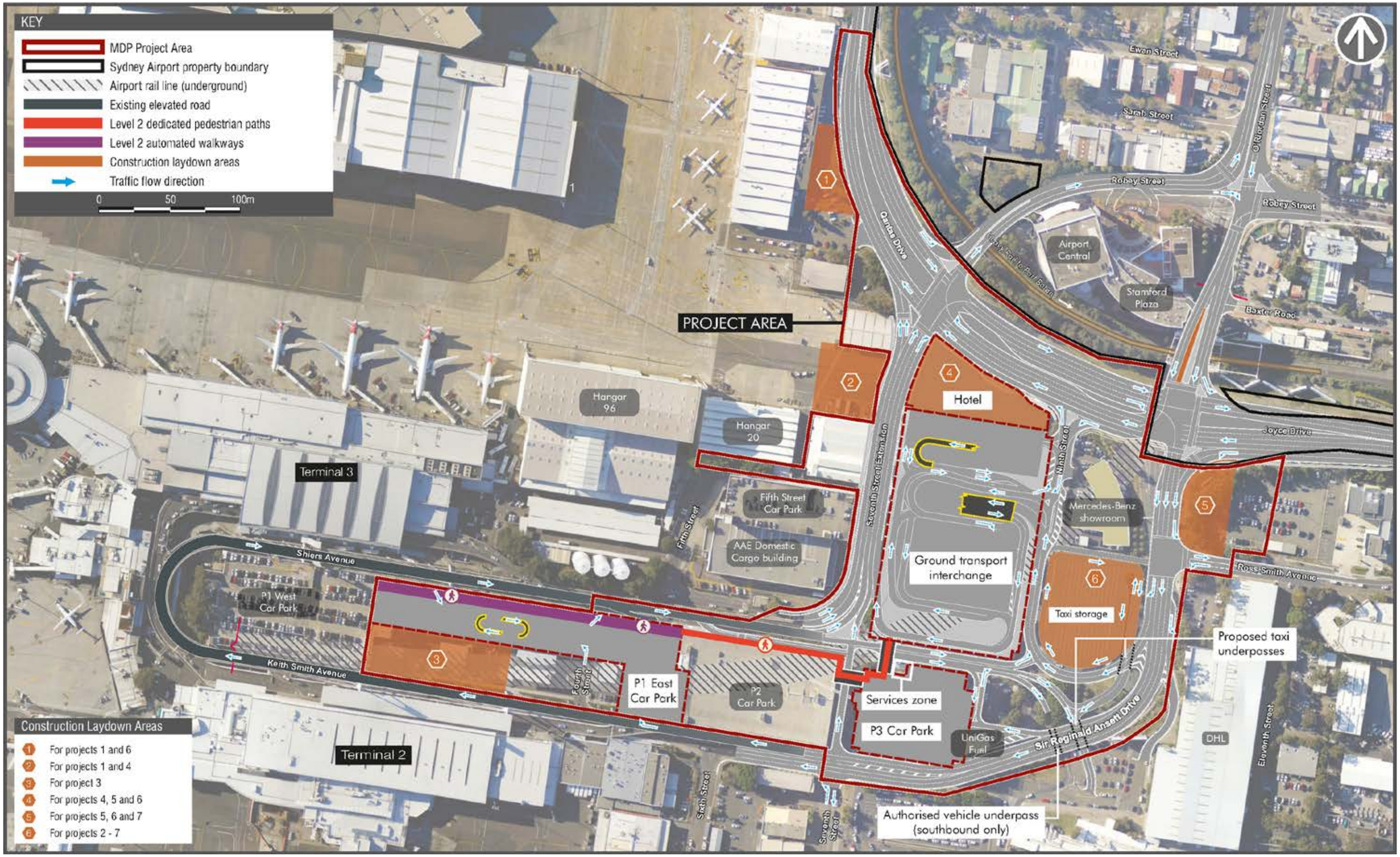
Figure 4.23 Proposed construction staging



Source: AECOM

Figure 4.23 (overleaf)

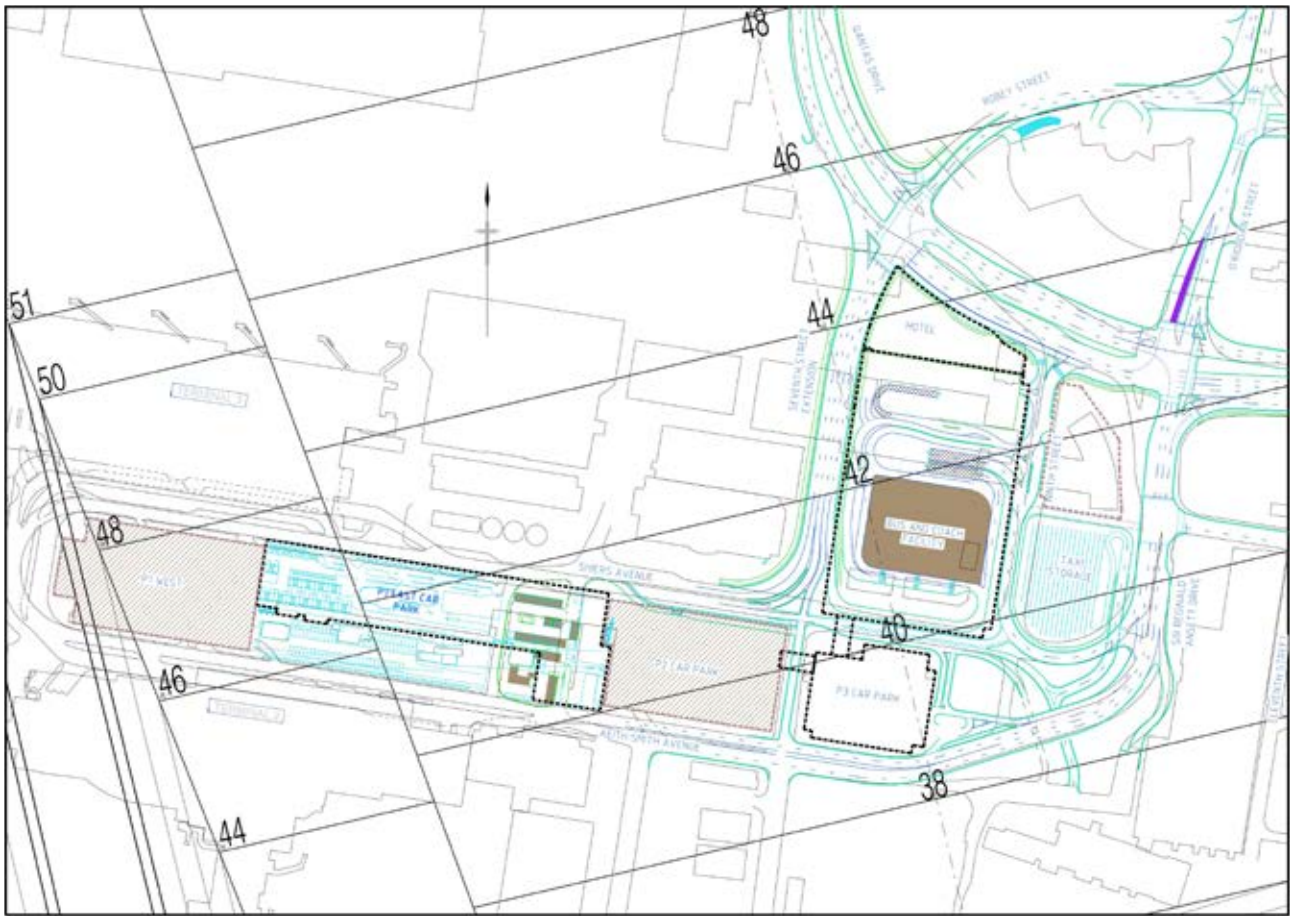
Figure 4.24 Construction laydown areas



Source: AECOM

← Figure 4.24 (overleaf)

Figure 4.25 Obstacle limitation surface (OLS)



- landscaping for on-site water management.

Plant efficiencies

- energy efficient chillers, boilers, and motors for heating, ventilation and air conditioning and water requirements; and
- maintenance and monitoring program.

Construction materials

- materials that are durable, low maintenance and recyclable;
- levels of finish and quality to minimise maintenance and/or replacement;
- materials with low embodied energy where possible; and
- locally manufactured materials where possible.

4.5 Landscaping and urban design

4.5.1 Urban design concept

The urban design concept for the new roadway arrangements will ensure that the gateway function to north-east precinct of the airport is suitably expressed at the new intersection of the Seventh Street extension and Qantas Drive. Modifications to the existing gateway design at the northern end of Sir Reginald Ansett Drive will be required.

The concept will allow for the eventual development of enhanced pedestrian facilities and active spaces between the proposed development and longer term terminal expansion consistent with the Master Plan 2033. The Ground Transport Interchange and hotel will provide quality facades and active ground level uses.

4.5.2 Landscaping

As discussed in Section 8.7, about 30 existing trees (both indigenous and exotic species) located within the site area boundary will be removed to enable construction of the proposed development.

Through the Sydney Airport Environment Strategy 2013-2018, Sydney Airport has committed to preserve and, where practicable, enhance the significant native biodiversity habitat on the airport. To meet this commitment, when tree removal is required for operational or development reasons, a qualified arborist is engaged

to undertake a value assessment of the trees proposed for removal. Appropriate replanting is then carried out elsewhere in the airport.

4.6 Directional signage and way-finding

Changes will be required to the directional signage and traffic information systems on roads leading to and within the north-east precinct to inform drivers of new access arrangements within the precinct and, in particular, the location of the entry in Ninth Street to the Ground Transport Interchange, access to the proposed hotel, and change to access P1 East.

Interactive way-finding will be provided along the above-ground pedestrian corridor from the Ground Transport Interchange and other car parks to facilitate pedestrian access to and from T2 and T3.

4.7 Advertising and signage billboards

Provision will be made for advertising and signage billboards on the eastern, western and southern facades of the Ground Transport Interchange and the north and south facades of P1 East. Building identification and/or corporate signage may be provided on the hotel's facades and also at street level.

4.8 Construction staging

4.8.1 Staging

As described in Section 4.2, the proposed works will be implemented via seven projects as shown on **Figure 4.23**. This approach will enable progressive review of resulting traffic outcomes in the T2/T3 landside precinct and reassessment of priorities, timings and any adjustment of designs for subsequent work elements.

4.8.2 Delivery method

Some of the proposed seven projects are likely to be delivered concurrently during the various construction phases as site, project management and other conditions permit (see Section 4.9).

Sydney Airport will progressively undertake detailed design of each project of the proposed works to enable competitive tendering by contractors for each project or parts thereof. On appointment, the successful contractor will be required to prepare a number of contract management documents including a construction environmental management plan to address all relevant issues identified in this MDP and other Sydney Airport requirements.

4.8.3 Construction issues

Piling to a depth of approximately 20 metres below the existing ground level to rock will be required to provide foundations for the Ground Transport Interchange, P1 East, the new vehicle/pedestrian links and the hotel. This type of construction has been used recently for buildings and structures in the north-east precinct such as the P3 parking structure.

In addition, the presence of the Airport Link rail tunnel beneath the south-east part of the Ground Transport Interchange and P1 East sites will require the installation of in-ground transfer beams to provide support for the above-ground structural grid.

Sufficient laydown area for construction activities will be provided (see **Figure 4.24**). Sydney Airport has considerable experience in managing major construction projects so that landside access to T2 and T3, car parking requirements and the aviation functions of the airport are not impeded.

During the construction period, it is anticipated that a peak construction workforce of some 500 personnel could be on-site.

4.9 Development program and construction cost

4.9.1 Development program

Following the issue of development approval and construction approval, Sydney Airport intends commencing construction of Projects 1-3 as a matter of priority considering project dependencies. The commencement of construction for Projects 4 to 7 will be assessed based on forecast demand for the capacity in combination with the completion of the WestConnex Enabling Works to be undertaken by the NSW Government to minimise long periods of disruption to the surrounding traffic network. Sydney Airport will continue to work closely with the NSW Government and its transport agencies to ensure a timely and coordinated development program.

4.9.2 Cost of construction

The total project construction costs of the proposed T2/T3 Ground Access Solutions and Hotel are estimated to be approximately $295 million (excluding GST). This cost estimate is subject to review and includes all on-airport road works, access enhancements/facilities, the hotel and other elements of the project.

4.10 Operation and maintenance

4.10.1 Hours of operation

As with P1, P2 and P3, the proposed Ground Transport Interchange and the redeveloped P1 East will operate 24 hours a day, seven days a week. Although the airport operates with a curfew on most aircraft movements between 11pm and 6am, the 24-hour operation of this facility will cater for a variety of users including operational vehicle storage whose work hours include the curfew period.

Similarly, the proposed hotel will operate 24 hours per day, seven days a week as is the usual practice for 4 to 5 star hotels.

4.10.2 Maintenance and life cycle

The buildings will be operated within the airport's overall asset management function.

Where appropriate, existing maintenance contracts could be extended to cover the proposed Ground Transport Interchange.

The hotel operator will be responsible for maintenance of the hotel and any associated retail floor space.

4.11 Relationship of the development to aviation operations and airport capacity

As the site of the proposed development includes areas of land currently designated as airside and which are used for aviation activities, consideration has been given to the relationship of the proposed T2/T3 Ground Access Solutions and Hotel MDP to aviation operations and airport capacity.

The proposed development will not affect any current operations elsewhere in the T2/T3 precinct. No changes of access to the existing departures, arrivals roads and car parks are proposed apart from vehicles that would make use of the bus and coach facility.

4.11.1 Relationship of the proposal to airport navigational aids and radar

The proposed development requires consideration from several perspectives in relation to aviation safety requirements by:

- Airservices Australia (Airservices) in relation to the integrity of its operational responsibilities and systems;
- Sydney Airport, CASA and the Department of Infrastructure and Regional Development in relation to the Obstacle Limitation Surface (OLS) and the Procedures for Air Navigation Services Operations (PANS-OPS) Surfaces.

Given the location and heights of the proposed development in what will be reconfigured as part of the landside area of the T2/T3 precinct, it is not anticipated that the proposed works would adversely impact the performance of any precision/non-precision navigational aids, HF/VHF communications, radar, PRM, ADS-B, WAM or satellite links.

Sydney Airport has been made aware by Airservices of a remote unit of the Sydney Airport A-SMGCS system that will require relocation to retain line-of-site with a reference transmitter. Sydney Airport will work with Airservices to relocate the unit to an alternative site to ensure the A-SMGCS system remains effective.

Sydney Airport will continue to engage with the relevant authorities during the detailed design phase of each project to ensure the proposed works do not affect the airport's navigational aids.

As defined by CASA, Obstacle Limitation Surfaces (OLS) are 'a series of planes associated with each runway at an aerodrome that defines the desirable limits to which objects may project into the airspace around the aerodrome so that aircraft operations at the aerodrome may be conducted safely'. The purpose of the OLS is to ensure both the safe operation of aircraft in the vicinity of the airport and the operational viability of all runways.

Building heights in the north-east precinct are determined by application of the OLS which have been defined for Sydney Airport. The site for the proposed development has height limits of 38 metres AHD at Shiers Avenue, 46 metres adjacent to T2 and T3 and approximately 44 metres AHD at Qantas Drive which are primarily dictated by the OLS from Runway 16L/34R. The OLS height limits across the project area are shown in **Figure 4.25**.

Any structure, including construction cranes, extending to a height greater than that permitted in prescribed airspace across the site will require approval from the Department. This situation also applies irrespective of runway closure due to overall airfield safety.

Any structure to be constructed or equipment to be used for construction will require an application to be lodged with Sydney Airport, the ABC and the AEO for assessment for approval in accordance with the *Airports Act 1996*; and with CASA, Airservices Australia and input from the airlines under the *Airports (Protection of Airspace) Regulations 1997*.

4.11.2 Impacts on aviation activities

Wind assessment

Given the proximity of the two new proposed buildings, the extensions to and redevelopment of the existing parking structures to Runway 25, located approximately 470 metres south of the south-eastern corner of the project area, an assessment using wind tunnel testing was undertaken in relation to wind shear[29] and wind turbulence. This assessment is reported in Wind Tunnel Tests for Ground Transport Interchange and Hotel MDP[30], Sydney Airport, NSW, Australia. Key findings are presented below.

Approach

The primary aim of this assessment was to determine the influence of the proposed development on the wind characteristics for landing aircraft at the airport. Landing aircraft decelerate and move slower than departing aircraft and are therefore more susceptible to changes in the relative wind speed between the aircraft and the wind. Departing aircraft also generally ascend more rapidly than landing aircraft descend, which further reduces their susceptibility to changes in wind conditions. As a result, the location of most interest for aircraft operations is on the immediate approach to the touchdown point and subsequent deceleration along the runway.

This assessment used the guidelines developed by the National Airports Safeguarding Advisory Group (NASAG) (2012) in relation to wind shear and results of wind tunnel testing undertaken. A model of the project was fabricated to a length scale of 1:600 with the runway centered on the turntable in the wind tunnel. A replica of the surrounding terrain within a 900 metre radius was constructed and placed on the turntable. The wind tunnel testing was performed in the natural boundary layer wind tunnel of Cermak Peterka Petersen Pty. Ltd., St Peters. Appropriate approach boundary layer conditions representative of a built-up environment were established in the test section of the wind tunnel. The wind flow had appropriate turbulence characteristics corresponding to Terrain Category 3 as defined in Standards Australia (2011).

Wind shear and Turbulence

The greatest effect of the proposed development on a landing aircraft would be when the wind is coming directly over the proposed buildings from the north to north-west and the aircraft was landing onto Runway 25 (approaching from the east). The touchdown point would lie directly downwind from the proposed buildings so the aircraft would be at a critical position of the flight path. Winds from the north to north-west occur about 7 per cent of the year.

Measurements of wind conditions at various locations along the glide slope to Runway 25 and on the runway itself were made for two critical wind directions. These measurements were compared against the NASAG (2012) wind shear criterion and the Nieuwpoort et al. (2010) turbulence criterion for aircraft operations.

Under standard operating procedures, the wind conditions would not exceed the wind shear and turbulence criteria established in Nieuwpoort (2010) and reproduced in NASAG (2012). The addition of the proposed buildings would not be expected to cause operational difficulties during standard operating procedures.

Dust generation

The implementation of the proposed dust mitigation measures proposed in Section 8.5 would adequately control dust generating activities especially during the preparatory works and early stages of construction. As a result, it is not anticipated that there would be any adverse impact on aircraft operations from any dust generated by construction activities.

Plumes

A vertical plume rise assessment will be undertaken where required in accordance Civil Aviation Safety Authority Circular 139-5(1) for any exhausts from the development.

4.11.3 Impacts on airport operations during construction

All the construction and related works will be undertaken on landside areas (once the airside/landside boundary is reconfigured in/adjacent to the site area as part of the enabling works) but close to airside aircraft operations. Given the scale of the proposed buildings, it is likely that large cranes will be used during construction. Any crane penetration through the OLS, if required during construction, will require temporary approval from Sydney Airport and will be managed to ensure that there is no impact on airport operations.

As a result, it is not anticipated that there would be any impact on airport operations during the construction of the proposed works.

To ensure that appropriate access is maintained to T2 and T3 and within the north-east precinct generally, some construction works will be undertaken during the overnight curfew period (between 11pm and 6am) that applies to aviation operations at the airport.

29 For the purposes of this assessment, wind shear is based on a difference in mean wind speed between two locations, while turbulence is the natural variation in the wind speed and direction due to the flow over the ground.

30 Cermak Peterka Petersen 2014

The operation of the proposed development will not affect any current operations elsewhere in the north-east precinct such as the one-way, two-level road access to T2 and T3 or to existing commercial and other facilities along the Ross Smith Avenue corridor (east of Sir Reginald Ansett Drive). No changes of access to the existing departures and arrivals roads and public car parks are proposed.

Current access for emergency vehicles will be maintained to the front of both T2 and T3 at both levels during construction and once the ground access improvements in this precinct are completed.

4.11.4 Relationship to airport capacity

Implementation of the proposed T2/T3 Ground Access Solutions and Hotel MDP will assist the realisation of planned airport developments presented in the recently approved Master Plan 2033 with appropriate levels of service and safety for vehicles, cyclists and pedestrians.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Chapter 5

NSW Government Off-Airport Complementary Works

CHAPTER

5 / NSW GOVERNMENT OFF-AIRPORT COMPLEMENTARY WORKS

KEY POINTS

- These Off-Airport Complementary Works discussed in this chapter are for information purposes only. They do not form part of this major airport development and will not be assessed in this MDP under the provisions of the *Airports Act 1996*.
- To function at an optimal level and to complete the integrated design solution, additional proposed roadworks outside the airport boundary would include:
  - Widening of Joyce Drive and General Holmes Drive between O'Riordan Street and Mill Pond Road to three lanes in each direction;
  - Improving the Mill Pond Road intersections with General Holmes Drive and Botany Road and the replacement of the rail level crossing with a road underpass that links General Holmes Drive, Botany Road and Wentworth Avenue;
  - Widening Marsh Street; and
  - Robey Street becoming one way northbound from Qantas Drive to the intersection of O'Riordan Street and O'Riordan Street becoming one way southbound between Robey Street and Joyce Drive with associated intersection improvements at Joyce Drive and O'Riordan Street
- Funding for the design and construction of the initial phase of works has been approved and detailed discussions on design and coordination with Transport for NSW and NSW Roads and Maritime Services has commenced.

THE NSW GOVERNMENT WILL BE CONTRIBUTING SIGNIFICANTLY TO THE INTEGRATED GROUND ACCESS SOLUTIONS FOR THE KEY TRANSPORT GATEWAYS AT SYDNEY AIRPORT, PORT BOTANY AND THEIR ENVIRONS. STRATEGIC LAND USE AND TRANSPORT PLANNING BY THE NSW GOVERNMENT ACKNOWLEDGES THE ECONOMIC IMPORTANCE OF SYDNEY AIRPORT AND COMMITS TO DELIVERY OF TRANSPORT PROJECTS WITH EARLY GROUND-ACCESS WORKS ALREADY ANNOUNCED.

5.1 Context for the Off-Airport Complementary Works

The Off-Airport Complementary Works discussed in this chapter do not form part of this major airport development described in Chapter 4 and will not be assessed in this MDP under the provisions of the *Airports Act 1996* (Cwth). These off-airport works will be assessed by the NSW Government and not Sydney Airport.

Sydney Airport understands that all of the proposed Off-Airport Complementary Works discussed in this chapter are subject to NSW Government approval and will be subject to approvals under relevant NSW legislation such as the *Environmental Planning and Assessment Act 1979* and the *Roads Act 1993* as well as the *Environment Protection and Biodiversity Conservation 1999 Act* (Cwth) as appropriate. The approval processes may involve the preparation of:

- an environmental impact statement for state significant works and approval by the Minister for Planning; or
- a review of environmental factors for works with lesser potential environmental impacts with approval by RMS.

As noted in Section 4.2, the proposed works described in this MDP will benefit from additional works beyond the airport boundary announced by the NSW Government on 29 June 2014 in a joint statement with Sydney Airport..

There is, and has been, on-going and detailed consultation between Sydney Airport and the NSW Government, particularly with TfNSW and RMS on ground-access issues related to the airport. Recent consultation has occurred in the context of the preparation and finalisation of the recently approved Sydney Airport Master Plan 2033.

As a result of the strong, productive working relationship, options have been explored between Sydney Airport and the NSW Government in relation to a range of road upgrade projects in the airport precinct.

Some of these works are under way, including the WestConnex Enabling Works package and the WestConnex route selection. RMS and TfNSW are identifying a future package of road projects for delivery in the precinct.

For the purposes of this MDP, these works are identified as the Off-Airport Complementary Works. The description of these works is provided in this chapter to give a complete picture of how both the proposed on-airport works described and assessed in this MDP and the Off-Airport Complementary Works will integrate to provide improved ground access to, from and near the airport.

As the Off-Airport Complementary Works discussed in this chapter will take place beyond the boundary of the airport, their approval and implementation is not under the *Airports Act 1996* and cannot be the responsibility of Sydney Airport (see Section 10.2). The description of the Off-Airport Complementary Works presented in this chapter also informs the assessment of cumulative impacts presented in Chapter 8 of this MDP, particularly in relation to the management of construction traffic and ground noise in and around the airport in the period to 2018.

The precise nature of the works described in this chapter is likely to evolve as the NSW Government is continuing to develop and finalise its WestConnex Enabling Works package and route selection for the WestConnex Motorway.

5.2 Strategic planning framework

The importance of the airport at a national, state and local level is clearly acknowledged in recent strategic planning documents prepared by the NSW Government as well as in Sydney Airport's Master Plan 2033 which was prepared to meet the requirements of the *Airports Act 1996*. This recognition underpins the ongoing co-operation between the NSW Government and Sydney Airport to ensure that the very significant strategic benefits of the airport to the NSW community and economy are optimised. By way of example, by 2031 the airport will be the fifth largest employment centre in the Sydney metropolitan area with approximately 56,000 jobs (see **Figure 5.1**). This role underlines the importance of efficient ground access to and from the airport.

5.2.1 The NSW Government's strategic planning consideration of the airport

Three recent inter-related strategic planning documents prepared by the NSW Government refer to the strategic importance of the state's two international gateways – the airport and nearby Port Botany – and the need to improve ground access in their vicinity. These documents are the Long Term Transport Master Plan[31], the State Infrastructure Strategy[32] and the Draft Metropolitan Strategy for Sydney to 2031[33].

Long Term Transport Master Plan

The NSW Government released the Long Term Transport Master Plan (LTTMP) in December 2012[33]. The LTTMP sets a clear direction for transport in NSW for the 20 years to

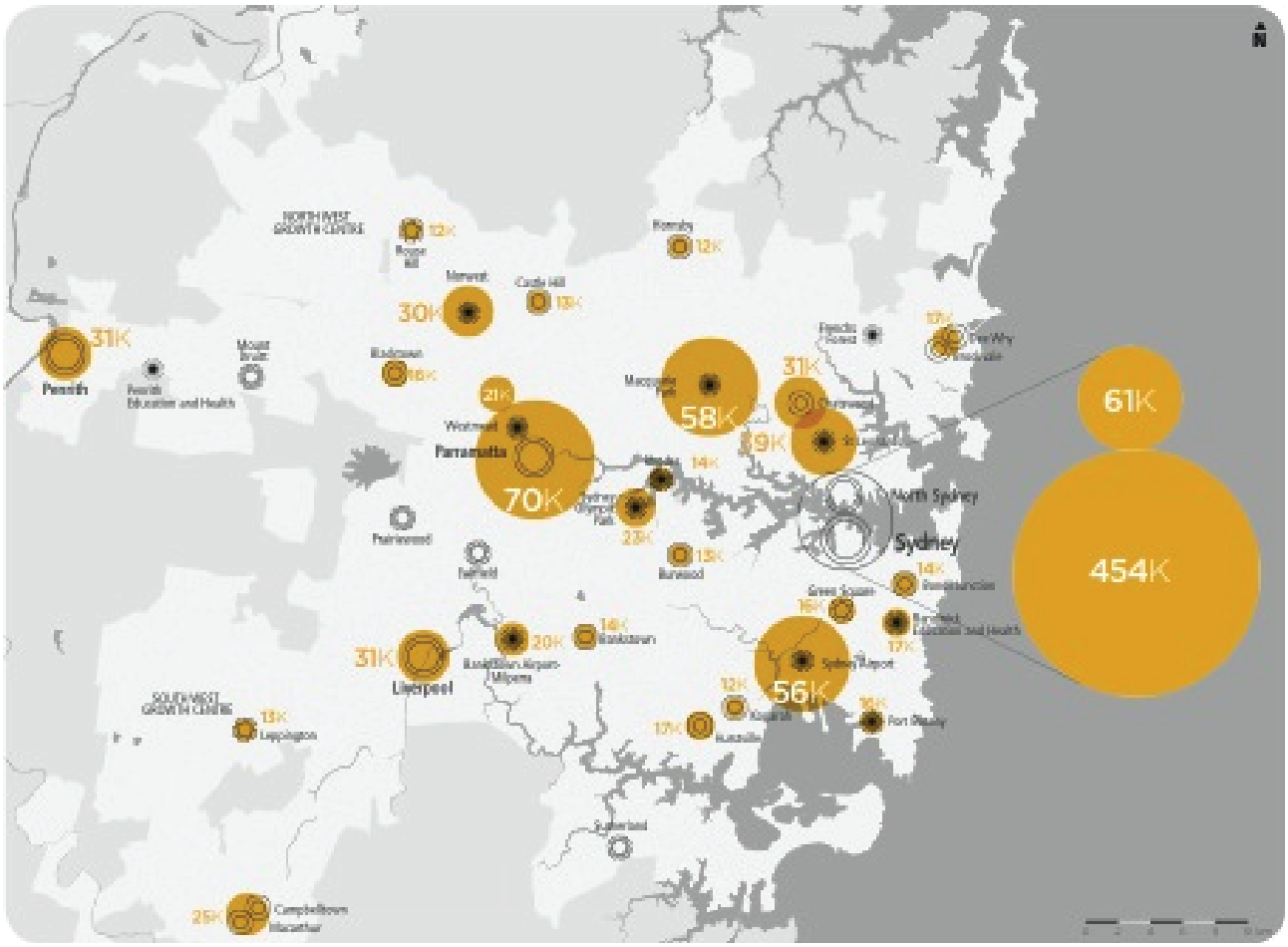
31 NSW Government 2012a

32 NSW Government 2012b

33 NSW Government 2013b

34 NSW Government 2012a

Figure 5.1 Major employment centres Sydney 2031



Source NSW Government 2012c, p.5

2031, bringing together all modes of transport across all regions of the state into a world class, integrated network that puts the customer first.

Based on analysis presented in the State Infrastructure Strategy[35], the LTTMP will guide the NSW Government's transport priorities over the next 20 years, providing the overall framework for how the NSW transport system develops – both the services that are delivered and the infrastructure that underpins them.

The extensive suite of actions proposed in the LTTMP responds to the following key transport challenges:

- keeping the city's most important transport corridors moving;
- providing travel options that support and enhance the strength and success of the central business district (CBD);
- improving connections across an expanded Sydney CBD;
- building a fully integrated city-wide transport system;
- sustaining growth in greater Sydney;
- providing better connections and services to Sydney's growth areas; and
- adopting a customer focus and adapting to the changing needs of customers.

The LTTMP identifies that two of metropolitan Sydney's six most constrained transport corridors link the airport and Port Botany with Liverpool to the south-west and the Sydney CBD to the north. Without action, travel times on these routes are likely to increase substantially over the next 20 years.

A number of proposed actions presented in the LTTMP to respond to these key transport challenges will enhance ground access to, from and around the airport.

Extracts relevant to the MDP from the LTTMP[36] are:

1. **A fully integrated transport system**, where customers move seamlessly across modes and between services, supported by the Opal ticketing system;

35 NSW Government 2012b

36 NSW Government 2012a pp12-13

2. **A modern railway system** – Sydney's Rail Future – to reform, improve and grow services on our rail network, leading to an overall capacity increase of 60 per cent;
4. **A modern bus system** that meets changing needs, particularly in growth areas, and complements the heavy and light rail networks;
5. **A connected motorway network in Sydney**, beginning with WestConnex, which will provide a step change in Sydney's connectivity, then the F3(M1)-M2 link, and then the F6(M1), alongside significant investments in arterial roads throughout regional NSW;
8. **Connecting regional communities** through major highway upgrades, improved NSW trains services including better connections with bus services, more community transport services, and protecting regional flights to Sydney Airport;
10. **Improve access to international gateways**, addressing road access pinch points around Port Botany and Sydney Airport, and improving public transport access to the airport through better rail and bus services and WestConnex serving the whole Port Botany and Sydney Airport precinct; and
11. **Boost walking and cycling and support its integration with public transport**, including extensions and improvements to the state's walking and cycling networks, better storage facilities and signs, and new interchanges that are attractive activity hubs for local communities.

Several of the principal recommendations in the LTTMP are well advanced in the planning and development stages or are already being implemented, namely WestConnex, the WestConnex Enabling Works, Sydney's Rail Future and Sydney's Bus Future. The key features of these proposals as they relate to the airport are presented in Section 5.3.

Draft Metropolitan Strategy for Sydney to 2031

In March 2013, the NSW Government released the Draft Metropolitan Strategy for Sydney to 2031 (the draft Metro Strategy) for community comment which was prepared by the Department of Planning and Infrastructure[37]. A key feature of the draft Metro Strategy is that for the first time land use planning for the metropolitan region is aligned with the Long Term Transport Master Plan[38] and the State Infrastructure Strategy[39].

In the draft Metro Strategy, the national gateways and employment hubs of the airport and Port Botany are identified as being located at the southern end of the Global Economic Corridor that will drive the economy for Sydney and NSW. In the Accessibility and Connectivity chapter, Objective 25 of the draft Metro Strategy is to 'improve access to major employment hubs and global gateways'. The draft Metro Strategy notes that:

> With the expected growth in demand for air travel and freight movements, access around Sydney Airport and Port Botany is vital to Sydney's international competitiveness. The Improvement Plan for Port Botany and Sydney Airport will address capacity constraints caused by competing demands on the road and rail networks. The WestConnex Motorway will also support connections to Sydney Airport and Port Botany.[40]

In relation to priorities for the Central subregion (within which the airport is located), the draft Metro Strategy identifies the following priorities for the Sydney Airport and Environs Specialised Precinct, all of which rely on an efficient transport system:

- protect and enhance industrial areas related to the economic function of Sydney Airport;
- manage the impact of surrounding development and passenger and freight growth on airport operations and transport systems; and
- provide capacity for at least 8,000 additional jobs in 2031[41].

Sydney Airport understands that after consideration of issues raised in submissions, the draft Metro Strategy is now being finalised.

5.2.2 Sydney Airport's strategic planning for ground transport

Under the *Airports Act 1996*, Sydney Airport is required to have an approved airport master plan incorporating a Five Year Ground Transport Plan and an Environmental Strategy. The most recent version – Sydney Airport Master Plan 2033 – was approved on 17 February 2014 by the Federal Minister for Infrastructure and Regional Development.

Sydney Airport Master Plan 2033

As discussed in Chapter 7 of this MDP and reflecting the content of the recently approved Master Plan 2033, Sydney Airport believes that the proposed T2/T3 ground access solutions together with NSW Government initiatives, including the WestConnex and WestConnex Enabling Works projects, have the ability to meet the forecast traffic demands around the airport up to and beyond the 2033 horizon of the Master Plan.

In the Master Plan 2033, the prospect of Off-Airport Complementary Works is identified as follows:

> The conversion of the lower sections of Robey Street and O'Riordan Street outside Sydney Airport's boundary into one-way roads northbound and southbound.

37 NSW Government 2013a
38 NSW Government 2012a
39 NSW Government 2012b
40 NSW Government 2013b, p71
41 NSW Government 2013b, p 84

Modelling shows that this configuration can support the forecast volume of traffic for 2018 and beyond at an improved service level when compared with today.

Sydney Airport will continue to advocate[42] for the widening of Joyce Drive and General Holmes Drive between O'Riordan Street and Mill Pond Road as this will result in higher traffic throughput capacity to and from the airport for non-airport through traffic including Port Botany heavy vehicle traffic[43].

The analysis underlying the 20 year ground transport strategy in the Master Plan 2033 incorporated modelling of all the roads and intersections on and immediately adjacent to the airport, and key roads and intersections in the vicinity.

The Master Plan 2033 sets out the short term ground access initiatives to be undertaken on the airport and foreshadows Off-Airport Complementary Works to assist in the optimal functioning of the integrated road network in the following manner:

Sydney Airport has consulted with TfNSW and RMS in developing this plan and will continue to work closely with them to ensure the transport network is consistent with the road network proposals identified in the LTTMP.

Sydney Airport sees the key development proposals of this integrated network including: ...

b) Outside Sydney Airport boundary

- Robey Street becoming one-way northbound from Qantas Drive to the intersection of O'Riordan Street and O'Riordan Street becoming one-way southbound between Robey Street and Joyce Drive with associated intersection improvements at Joyce Drive and O'Riordan Street; and
- The widening of Joyce Drive and General Holmes Drive to six lanes between Mill Pond Road and O'Riordan Street to provide consistent traffic access to the airport.[44]

Sydney Airport will continue to work closely with the NSW Government to discuss, prioritise and co-ordinate these proposed works with those proposed inside Sydney Airport's boundary, as the NSW Government is responsible for the road network changes outside Sydney Airport's property boundary[45].

5.3 Implementation of the NSW Long Term Transport Master Plan

5.3.1 WestConnex

In September 2013, the NSW Government confirmed that the $11.5 billion WestConnex project will be built in three stages (see **Figure 5.2**). The WestConnex project will help address existing issues on the wider metropolitan road network as well as cater for forecast traffic growth. This project is the responsibility of the NSW Government. Some local road links between WestConnex and the airport may be located on Sydney Airport land.

The relationship of the three stages of WestConnex to access to, from and around Sydney Airport is presented in **Table 5.1**.

5.3.2 WestConnex Enabling Works – Airport East

As part of the preparatory work for the construction of WestConnex, RMS is planning to upgrade roads east of the airport and remove the General Holmes Drive level crossing on the Sydenham to Port Botany Railway freight rail line that runs to the east of the airport, linking Port Botany to the metropolitan freight rail network. It is proposed that the rail level crossing will be replaced with a road underpass that will link General Holmes Drive, Botany Road and Wentworth Avenue (see **Figure 5.3**). This work will support the future duplication of the rail line.

Related road improvements included in this work are:

- extension of Wentworth Avenue to General Holmes Drive, and improvements to the Mill Pond Road intersection with General Holmes Drive and Botany Road respectively to support future traffic growth and efficient access to the airport; and
- widening of Joyce Drive and General Holmes Drive to three lanes in each direction between O'Riordan Street and Mill Pond Road to increase capacity and improve traffic flow around the airport and to Port Botany.

Given the direct and positive impact of this work on traffic safety and movements to, from and near the airport, close consultation on this project has been under way between RMS and Sydney Airport since 2011.

Implementation of the WestConnex Enabling Works – Airport East, would reduce congestion on the key approach roads to the airport such as Joyce Drive.

42 Subsequent to the lodging of the Master Plan 2033 for approval, RMS has started the approval process for the widening of Joyce Drive and the extension of Wentworth Avenue to General Holmes Drive on the east side of the airport.

43 Sydney Airport 2014a,p 80

44 Sydney Airport, p93

45 Sydney Airport p93

Figure 5.2 Overview of the WestConnex project

Source RMS 2013a

Table 5.1 WestConnex stages and relationship to airport access

WestConnex stage	Relationship to access to, from and around the airport
Stage 1 – M4 Parramatta to Haberfield This stage involves widening of the M4 from Church Street, Parramatta to near Concord Road and a 5km extension of the M4 via a tunnel under the Parramatta Road corridor to Parramatta Road and City West Link, Haberfield. Following the RMS's application in September 2013 for this element of WestConnex to be considered as state significant infrastructure under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (*EPA Act*), an Environmental Impact Statement (EIS) will be exhibited for public comment in early 2014. Detailed design and construction is due to start on this stage in early 2015 with completion scheduled for early 2017.	This stage will not directly change traffic patterns around the airport. However, it will reduce overall travel times to and from the airport and destinations in western and north-western Sydney and beyond. **Construction issues** As the closest works area will be at least 10km from the airport, it is not anticipated that any adverse traffic effects would be experienced in the airport environs during construction of this stage of WestConnex.
Stage 2 – M5 East Airport Link (Beverly Hills to St Peters) This stage involves duplication of the M5 East including the tunnels from Beverly Hills to Arncliffe, an 11km extension of the motorway from the tunnel portals at Arncliffe running north of the airport to St Peters and provision of a new access link to the Sydney Airport area – the Airport Link. Route development work is under way. The aim is to have identified a preferred option in mid-2014 for this stage. The EIS is expected to be exhibited for public comment in late 2015. Detailed design and construction work will commence in 2016 with Stage 2 scheduled to open to traffic in 2020.	The duplication of the M5 East will improve travel times to and from the airport and the south-western suburbs and along the Hume Freeway. The Airport Link will ultimately provide direct access to the airport from WestConnex from the western suburbs and inner west when Stage 3 is completed (see below). **Construction issues** The Airport Link will be completed in 2020 – two years after the T2/T3 Ground Access Solutions and Hotel in 2018. It is assumed that construction of this link will occur once the key elements of Stage 2 are complete (between 2018 and 2020) so there may not be an overlap with construction of the T2/T3 Ground Access Solutions and Hotel.

Table 5.1 WestConnex stages and relationship to airport access *continued*

WestConnex stage	Relationship to access to, from and around the airport
Stage 3 – M4 South (Haberfield to St Peters) This stage will deliver an 8.5km motorway tunnel with three traffic lanes in each direction connecting Stages 1 and 2 of WestConnex. From Haberfield, the tunnel will generally follow the Parramatta Road corridor before heading south near Camperdown. Route development work will be carried out ahead of community consultation in late 2015, with detailed design and construction work scheduled to start in late 2018. Stage 3 of WestConnex is due to open to traffic in 2023.	Completion of the WestConnex project in 2023 approximately five years after the completion of the T2/T3 Ground Access Solutions and Hotel will allow some non-airport traffic to bypass the airport (instead of using Qantas Drive and Airport Drive) and provide the opportunity for journey times to and from central Sydney to either precinct to be more reliable. With the completion of Stage 3 of WestConnex in 2023, travel times from Parramatta (Sydney's second CBD) to Sydney Airport are forecast to be reduced by 40 minutes. **Construction issues** Current planning indicates that construction of Stage 3 of WestConnex will commence after the completion of the T2/T3 Ground Access Solutions and Hotel.

Following environmental assessment and approval, it is estimated that this work would commence in 2016 and be completed by 2018. There is potential for some overlap of construction periods for this work and the early stages of the T2/T3 Ground Access Solutions and Hotel. Some road widening and extension works may impact on Sydney Airport land.

5.3.3 Sydney's Rail Future

Sydney's Rail Future – a plan to introduce new single deck high frequency trains as part of a major overhaul of the network which will eventually include a second rail crossing under Sydney Harbour – was announced by the NSW Government in June 2012[46]. The rapid transit trains will provide Sydney customers with more choice alongside suburban double deck trains and intercity trains.

The Airport Line will continue to be served by double deck trains. In a staged approach, a new timetable was implemented in October 2013 which now provides up to 10 services an hour for the Airport Line in peak periods.

Sydney's Rail Future foreshadows upgrades of the Airport Line to allow for more services to meet the needs of the growing south-west growth centre and Campbelltown region.

5.3.4 Sydney's Bus Future

Sydney's Bus Future – the NSW Government's long term plan to redesign the city's bus network to meet customer needs now and into the future – was released in December 2013[47]. Sydney's Bus Future will streamline more than 600 bus routes and will introduce a tiered network of rapid, suburban and local bus services. Each level will deliver a defined level of service:

- rapid routes will connect major centres and provide a 'turn up and go' service like existing Metrobuses, with a bus at least every 10 minutes on weekdays;
- customers on suburban routes will get a bus at least every 10 minutes in commuter peaks and every 15 minutes during the day on weekdays; and
- timetabled local services will complete the network with buses stopping every 400 metres.

The implementation of Sydney's Bus Future will improve journey times for customers by introducing bus priority infrastructure along key corridors, including more bus and transit lanes and traffic signal priority systems in areas like Parramatta, Macquarie Park, the Northern Beaches, the North-West and around Sydney Airport. High customer demand for travel from Southern Sydney to Sydney Airport can be met with a future proposed operation of a new suburban route between Miranda and Sydney Airport via St George, providing a minimum 15 minute all-day frequency.

5.3.5 Airport/Port Botany precinct works

In relation to the airport to the Sydney CBD corridor, the LTTMP notes that:

> Increasing activity at Sydney Airport, population and employment growth in the South Sydney and airport areas (including Green Square) and higher traffic along strategic connections to the south west growth centre, including the M5, will place increasing pressure on this corridor. Travel demand between the airport and the CBD is forecast to grow to 24,000 by 2031 for the morning peak, an equivalent of six lanes of traffic or more than 25 trainloads of seated passengers.
>
> Traffic to and from the airport mixes with through-traffic to and from the CBD. A solution for the corridor must address both types of traffic[48].

For the Sydney Airport to CBD transport corridor, key actions contained in the LTTMP are:

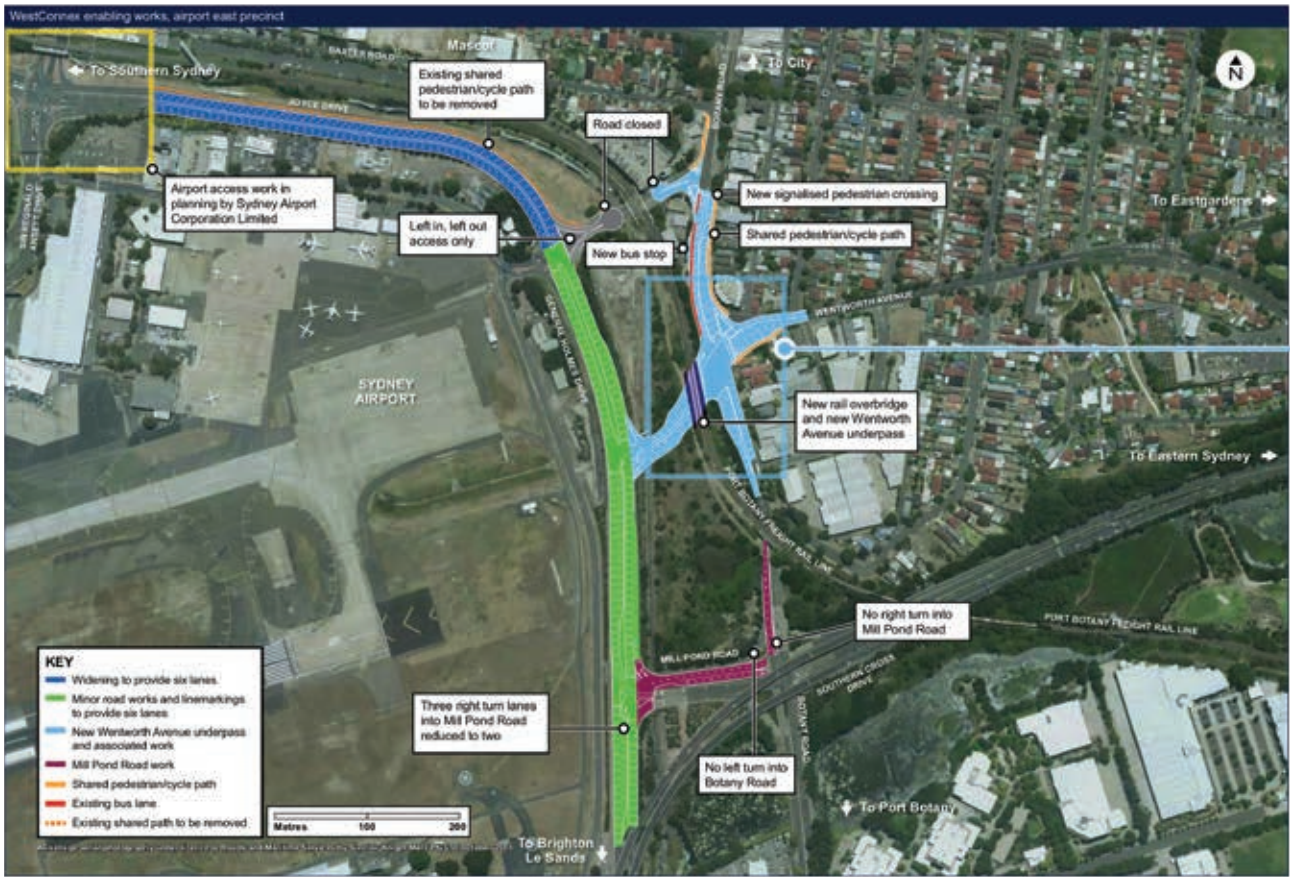
- added train capacity – the schedule of services on the Airport Rail Link is progressively being increased;

46 NSW Government 2012c

47 NSW Government 2013a

48 NSW Government 2012a, p 84

Figure 5.3 WestConnex Enabling Works – Airport East



Source RMS 2013b, 18

Source RMS 2013b, 18

- shifting more freight to rail or increasing capacity, reliability and safety of the rail line; and
- improvements to Botany Road.

Detailed planning is under way to address capacity constraints caused by competing demands on the road and rail networks in the precinct and identification of potential new and extended bus route options in the precinct has begun.

5.4 Scope of the Off-Airport Complementary Works

The scope of the Off-Airport Complementary Works is the responsibility of the NSW State Government. As discussed, Sydney Airport and the NSW transport agencies have a positive and co-operative working relationship and are working together to ensure that the final road network to be delivered by the T2/T3 Ground Access Solutions and Hotel and the Off-Airport Complementary Works function effectively.

The design concept presented and described in the Master Plan 2033 has progressed with the support of NSW transport agencies, however the concept identified here may undergo further revision and may not be fully representative of the final designs agreed to by RMS for implementation.

The design concept results in a one-way road pair formed by Robey and O'Riordan Streets feeding into and out of the airport's north-east precinct and are the subject to further design optimisation as a number of stakeholder issues are being considered. The proposed construction timing and co-ordination of the proposed Sydney Airport and NSW Government projects is currently under discussion. The works as proposed by Sydney Airport are described in the following sections and shown on **Figure 5.4**.

5.4.1 Proposed conversion of O'Riordan Street southbound and reconfiguration of the Qantas Drive/O'Riordan Street/Joyce Drive intersection

South of Robey Street, O'Riordan Street would be converted to one-way southbound to link direct to the main access route into the T2/T3 precinct.

As the Qantas Drive/O'Riordan Street/Joyce Drive intersection is outside the boundary of Sydney Airport, RMS would be responsible for its reconfiguration to accommodate the conversion of O'Riordan Street south of Robey Street to one-way southbound. The proposed reconfiguration would involve:

- lane marking to accommodate six lanes southbound – one lane connecting O'Riordan Street to Joyce Drive, two lanes feeding direct into Sir Reginald Ansett Drive within the airport leading to the T2/T3 precinct and three lanes accommodating right-hand turns into Qantas Drive westbound (including one bus-only lane);
- provision of a bus lane on O'Riordan Street south of Robey Street on the western side of the right turn lanes; and
- reconfiguration of traffic signal phasing to facilitate efficient south and westbound traffic movements and to enable the safe exit of buses from the bus stop.

5.4.2 Proposed conversion of Robey Street between O'Riordan Street and Qantas Drive to one-way north-east bound and reconfiguration of the intersection of Robey and O'Riordan Streets

North of the intersection reconfiguration to be undertaken within the airport boundary linking to the Seventh Street extension (see Section 4.2), this conversion would involve signalisation of the two-lane left turn from Qantas Drive to allow safe access to the Stamford Plaza Hotel and office tower.

Sydney Airport will continue to work with RMS and stakeholders to refine the overall design of the Off-Airport Complementary Works to provide appropriate access and exits for the existing hotel and commercial property and exits to the west from the underground car park on the west side of Robey Street.

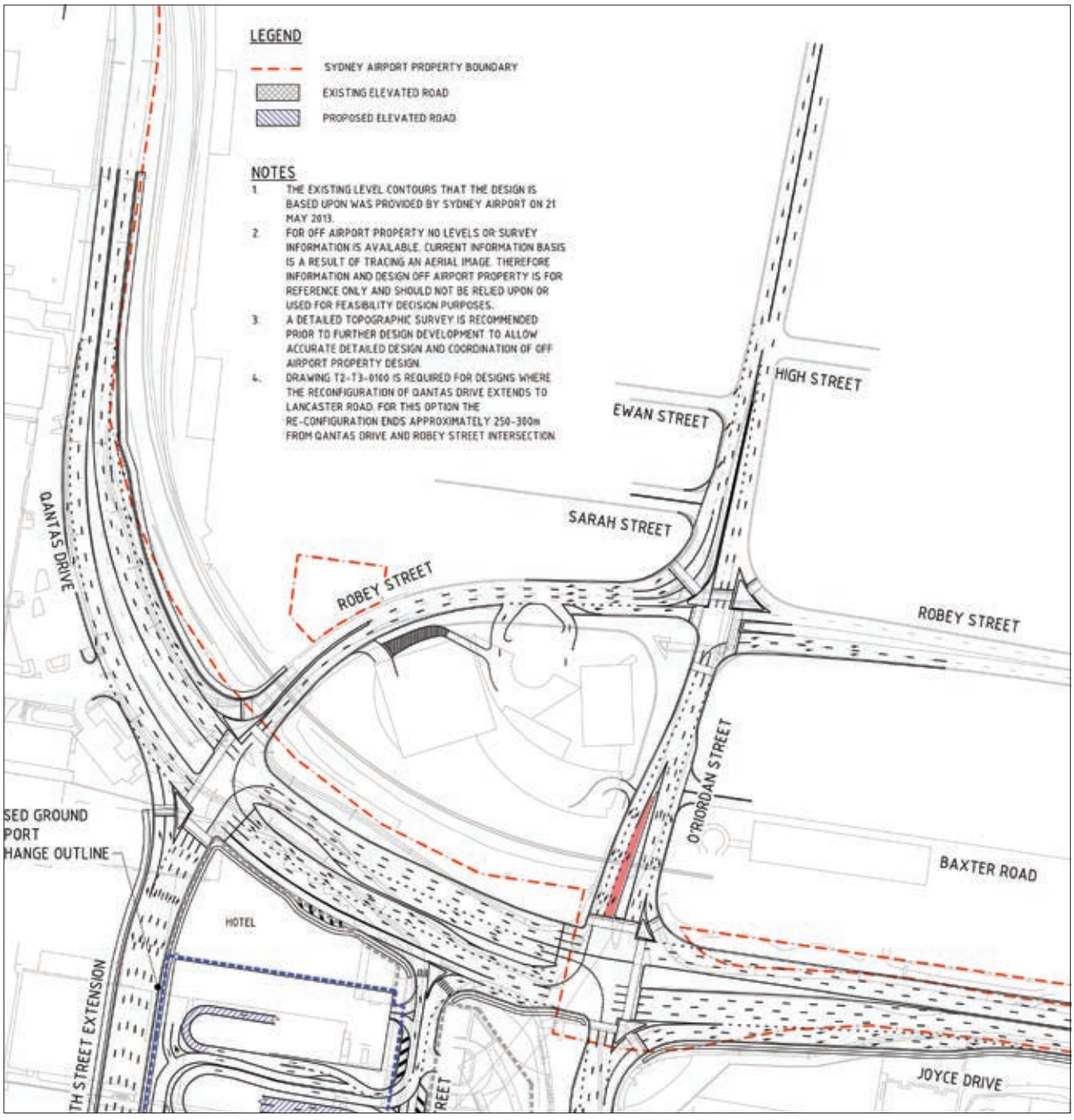
State Government and Sydney Airport traffic modeling supports the concept and the proposed arrangement would markedly reduce delays for northbound traffic on Robey Street by removing northbound traffic in O'Riordan Street between Qantas Drive and Robey Street. Consequently the northbound Robey Street traffic would flow freely onto O'Riordan Street and would only be held by pedestrians crossing Robey Street.

In the short to medium term north of Robey Street, O'Riordan Street would continue to accommodate two-way traffic.

5.4.3 Widening of Joyce Drive (west of the Ibis Budget hotel)

Some works may need to be undertaken in Joyce Drive by RMS from east of O'Riordan Street to General Holmes Drive to widen the existing carriageways from four traffic lanes to six.

Figure 5.4 Proposed Off-Airport Complementary Works



5.5 Implementation of Off-Airport Complementary Works

The scope and timing of the implementation of the proposed Off-Airport Complementary Works is the responsibility of the NSW Government. Sydney Airport will continue to support the NSW Government in their consultation with other stakeholders about the timing and scope of the proposed Off-Airport Complementary Works.

The key objective from Sydney Airport's perspective is that these works be delivered in a timely manner consistent with the proposed T2/T3 Ground Access Solutions and Hotel documented in this MDP so that optimum and coordinated ground travel outcomes can be achieved in this location for both airport and non-airport traffic.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Chapter 6

Approach to Assessment

CHAPTER

6 / APPROACH TO ASSESSMENT

SYDNEY AIRPORT'S PROPOSED GROUND ACCESS SOLUTIONS AND HOTEL HAVE BEEN THOROUGHLY ASSESSED AND PROVEN TO WORK. THIS CHAPTER PRESENTS THE APPROACH TO THE ASSESSMENTS OF THE CONSTRUCTION AND OPERATIONAL IMPACTS INCLUDING TRAFFIC AND TRANSPORT, ENVIRONMENTAL, ECONOMIC AND COMMUNITY ASSESSMENTS. A GENERAL DESCRIPTION OF THE LOCAL AND REGIONAL ENVIRONMENTS IS ALSO PRESENTED.

6.1 Approach to assessment

The description and assessment of the proposed T2/T3 Ground Access Solutions and Hotel has been prepared in accordance with the relevant provisions of the *Airports Act 1996*, the *Airports Regulations 1997* and the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). In relation to the assessment of environmental impacts of a major airport development such as the proposed development, Sections 91(h) and (j) of the *Airports Act 1996* require:

(h) the airport-lessee company's assessment of the environmental impacts that might reasonably be expected to be associated with the development; and

(j) the airport-lessee company's plans for dealing with the environmental impacts mentioned in paragraph (h) (including plans for ameliorating or preventing environmental impacts).

To meet this statutory requirement, impact assessments and specialist studies have been undertaken in relation to the proposed development for the aspects shown in **Table 6.1**.

The preparation of specialist studies generally involved:

- preparation of a detailed project description including plans showing area of investigation for specialist studies;
- preparation of the scope of work for each area of specialist assessment including standard report format and terminology;
- progressive technical review of specialist studies for accuracy, clarity and consistency; and
- sign-off of each specialist study by the relevant consultant.

The key aspects of each specialist study are presented in the relevant sections of Chapters 4, 7, 8 and 9 respectively. Each of these reports is available on request.

6.2 Approach to traffic impact assessment

The objectives of Sydney Airport's Ground Access Solutions include making it easier for airline passengers and other airport users to travel to and from the airport by car, taxi, coach or public transport and that the solutions also deliver improvements in the road network for local and regional communities. A traffic and transport assessment[49] was undertaken to review and validate the impacts of the proposed development on internal operations within the landside area of the T2/T3 precinct and the surrounding road network to evaluate road infrastructure improvements to accommodate future growth.

To assess the traffic implications of the proposed MDP and validate the objectives, the proposed ground access works have been assessed using demand, micro-simulation and corridor modelling analyses for the scenarios presented in **Table 6.2**.

The demand modelling used in the preparation of this MDP is a refinement of the process used for the Master Plan 2033. To inform the Master Plan 2033, Sydney Airport, together with TfNSW and RMS jointly commissioned Sweeney Research to survey more than 14,000 airport users (passengers, staff, and meeters and farewellers). The survey results provided a robust data set from which to extract key characteristics about traveller behaviour for input into the demand-modelling process.

The outcomes of this survey were used extensively to inform the development of the ground transport proposals in the Master Plan 2033 and hence this MDP. Some of the key metrics used in determining forecast travel demands included:

- mode share proportions for all traveller types – passengers, meeters and farewellers, and employees;
- travel behaviours of meeters and farewellers such as the size of group and time of arrival;
- passenger lead/lag times such as the time of arrival before flight departures;
- the proportion of travellers with a meeter or fareweller – to indicate the number of additional visitors to the airport; and
- traffic origins and destinations – to confirm the most common travel routes.

Table 6.1 Impact assessments and specialist studies

Assessment	Specialist studies
Wind shear impacts	Wind Tunnel Testing (Cermak Peterka Petersen 2014)
Traffic impacts	Traffic and Transport Assessment (AECOM 2014b)
Environmental impacts	Soil and Groundwater Contamination (Douglas Partners) Surface Water Quality and Hydrology (AECOM 2014b) Ground Noise (SLR 2014) Air Quality (Pacific Environment Limited 2014) Hazard and Risk (AECOM 2014c) Ecology (AECOM 2014d) Heritage (GML Heritage 2014)
Economic and community impacts	Economic Impact Assessment (AECOM 2014e) Visual Impact Assessment (AECOM 2014f)
Cumulative impacts	Included in environmental impact assessments

49 AECOM 2014a

Passenger demand forecasts for 2018 – the five year planning horizon for the Ground Transport Plan – were developed using the results from the survey and airside demand forecasts.

6.3 Approach to environmental assessment

6.3.1 Range of environmental impacts

The range of environmental impacts assessed in this MDP are based on Sydney Airport's consideration of the nature, size and location of the proposed T2/T3 Ground Access Solutions and Hotel as part of the overall project development process. This consideration resulted in the need for a range of specialist investigations to be undertaken by suitably experienced consultants (see Section 6.1). Other assessment material was prepared by Sydney Airport.

The following documentation has been referred to in the identification and assessment of environmental aspects relating to the construction and operation of the T2/T3 Ground Access Solutions and Hotel:

- Sydney Airport Master Plan 2033;
- Sydney Airport Environmental Strategy 2013-2018;
- *EPBC Act* Policy Statement 1.1 Significant Impact Guidelines – Matters of National Environmental Significance 2013;
- *EPBC Act* Policy Statement 1.2 Significant Impact Guidelines – Actions on or Impacting on Commonwealth Land and Actions by Commonwealth Agencies 2006;
- relevant existing studies where available; and
- specialist environmental studies prepared by consultants as part of the MDP process (see **Table 6.1**).

6.4 Approach to economic and community assessment

Potential impacts of the proposed T2/T3 Ground Access Solutions and Hotel on local and regional communities have been considered with regard to guidance provided by the Department of Infrastructure and Transport's Significant Impact on the Local or Regional Community Guide[50].

The identification of community issues relevant to assessment of the proposed development has also been informed by stakeholder consultation on the proposed development (see Section 3.2) as well by issues related to the planned development of the airport of interest to stakeholders identified by analysis of issues raised in submissions on the recently approved Master Plan 2033.

Specialist studies prepared by consultants as part of the MDP process in relation to economic and community issues are economic impact assessment[51] and visual impact assessment[52].

6.5 Approach to determination of level of impact

For each element assessed in Chapters 7, 8 and 9, based on the specialist studies and other information, impacts are identified by Sydney Airport as being either:

- unavoidable – within the parameters for the proposed development, there are no options to avoid the likely impacts;
- potential – through either detailed design considerations and/or the application of nominated mitigation measures, impacts can be mitigated so that the residual impacts will either:
  - meet the applicable (and usually quantitative) standards or guidelines for impact elements such as noise or air quality; or

Table 6.2 Traffic modelling scenarios

Scenario (software used)	Details
2012 Base (Commuter)	2012 base year
2018 Do Nothing (Commuter)	2018 demands with no road infrastructure changes
2018 MDP (Commuter)	2018 with MDP road infrastructure + network wide upgrades
2023 MDP+ (LinSig)	2023 demands with MDP road infrastructure plus any upgrades required to achieve satisfactory performance
2028 MDP+ (LinSig)	2028 demands with MDP road infrastructure plus any upgrades required to achieve satisfactory performance
2033 Master Plan (Commuter)	2033 demands with 20 year ground transport plan (MP2033) infrastructure and WestConnex

Source AECOM 2014a, p17

50 2012

51 AECOM 2014e

52 AECOM 2014f

Table 6.3 Level on impact assessment criteria

Assessment criteria	Assessment	Level of impact
Compliance with applicable statutory criteria or non-statutory guidelines	Fully complies	None, no change or negligible[53]
	Partly complies	Low to moderate
	No compliance	Severe or significant
Timing and duration of impact – either extensive proportion of the construction or operational period and/or sensitive time of day or day of week for both periods	Occasional	None, no change or negligible
	Short-lived but regular	Low to moderate
	Regular and consistent/long term	Severe or significant
Proximity to and number of nearest or sensitive receivers – construction and operations	Small number and at threshold distance for impact exposure	None, no change or negligible
	Medium number and mid-range	Low to moderate
	Large number and/or close	Severe or significant
Severity of impact and ability to mitigate	Full mitigation	None, no change or negligible
	Partial mitigation - reduction in severity, duration and/or timing of impact	Depending on extent of mitigation possible and resulting residual impact – low to moderate
	No mitigation	Severe or significant

– be consistent with qualitative levels for impact elements such as visual impact or local community impacts deemed to be acceptable to relevant stakeholders.

For each impact element, based on the assessments prepared during both construction and operational periods, a level of impact was ascribed generally as a combination of one or more of the following criteria in **Table 6.3**:

6.6 Approach to cumulative assessment

The *Airports Act 1996* does not explicitly require consideration of the cumulative impacts of a major airport development in a MDP. However, Sydney Airport considers it appropriate to include such an assessment in this MDP because of other development projects that may be undertaken concurrently on the airport with the T2/T3 Ground Access Solutions and Hotel.

The intent of the cumulative assessment presented in Section 8.9 is to provide information that will assist Sydney Airport and other relevant stakeholders to co-operatively manage any resultant concurrent and/or cumulative impacts during the construction and operation of the T2/T3 Ground Access Solutions and Hotel.

6.7 Local and regional environments

The assessment of the proposed T2/T3 Ground Access Solutions and Hotel is based on existing conditions in the local and regional areas. General descriptions of the local and regional environments are given below. Specific local and regional environmental characteristics that inform particular assessments are presented in the relevant sections of Chapters 7, 8 and 9.

6.7.1 Local environment

The project area for the proposed T2/T3 Ground Access Solutions and Hotel is located in the central part of the airport's north-east precinct. This precinct is largely occupied by T2 and T3, which have been progressively developed over many decades. These two terminals are currently the location of domestic and regional scheduled air services. The area between T2 and T3 is occupied by multi-level car parks serving parking demands of this precinct including passengers, meeters and farewellers, staff, and rental car and valet parking pick-up and drop-off locations.

The Southern Hangar Line adjacent to the Jet Base occupies airside land to the north and east of T3, extending to the western edge of the project area including buildings such as Hangars 58 and 85 which will be demolished to make way for the proposed development. Other airside

53 Negligible can cover situations where there is an impact, for example, an increase in traffic noise but the forecast levels are within the relevant levels specified

land in the precinct is largely occupied by apron areas for aircraft parking at terminal gates or remote stand-off areas as well as active taxiways providing access to and from Runways 16L/34R (the main north-south runway) and 07/25 (the east-west runway).

A horseshoe-shaped one-way two-level road system serves the two terminals and car parks west of Sir Reginald Ansett Drive. The principal connection point to the arterial road network beyond the airport is currently located beyond the airport boundary at the intersection of Sir Reginald Ansett Drive with Joyce Drive to the east, Qantas Drive to the west and O'Riordan Street to the north. Secondary road connections into and through the north-east precinct are provided by:

- Ninth Street (left in from and left out to Qantas Drive); and
- Ross Smith Avenue, which provides access to commercial developments on its north side as well as connecting to the wider road network at both Lords Road and General Holmes Drive.

The major parallel transport routes of Qantas Drive and Joyce Drive and the Sydenham to Botany freight rail line define the boundary of the north-east precinct of the airport. The heavy vehicle road traffic volumes (especially in peak periods) and freight train services contribute to the ground noise and air quality in this precinct (in addition to the aircraft noise and air emissions generated by the airport's operation).

The suburb of Mascot is immediately to the north-east of the north-east precinct of the airport. Areas close to the airport and along the main road corridors such as O'Riordan Street and Bourke Road leading to Sydney's CBD are the location of an increasing range of airport-related developments including freight forwarding companies, commercial offices, hotels and long-term car parks. Areas of lower density, older residential or redundant industrial sites are gradually being redeveloped into higher density residential and commercial properties. The visual environment of the areas adjoining the airport is now increasingly characterised by multi-level buildings with high site coverage.

The environment of the north-east precinct of the airport is dominated by this urban and transport infrastructure development. There are only small areas of natural environment remaining in the vicinity of this part of the airport, notably the waterway system formed by the Engine Ponds and Mill Pond (part of the nationally significant Botany Wetlands) and Mill Stream to the south of Wentworth Avenue and General Holmes Drive. The south and eastern part of the north-east precinct generally drains southwards to the Engine Ponds and ultimately to Botany Bay via the Mill Pond and Mill Stream. The remainder of the north-east precinct drains northwards through the airport drainage system to Alexandra Canal then to Cooks River and Botany Bay.

Apart from the vegetated areas in the vicinity of the Engine Ponds and Mill Pond in the south-east sector of the airport, vegetation in and near the project area is largely limited to amenity tree planting and incidental landscaping around buildings and transport infrastructure. As a result, the local area generally does not support a wide range of native flora or fauna.

6.7.2 Regional environment

A key feature of the regional environment is the proximity of the airport to Sydney's CBD. The location of the airport – and the T2/T3 precinct in particular – some 8km from the central area of Sydney is a major attribute in a global city such as Sydney. Access to and from business, retail and tourist destinations from the airport is provided by both road-based public and private transport as well as the underground Airport Link rail service.

Road-based access from the airport's T2/T3 precinct to central Sydney, the inner southern and eastern suburbs as well as the suburbs on the north side of Sydney Harbour is provided principally by two road corridors:

- the higher order, largely limited access, dual carriageway system of Joyce Drive, General Holmes Drive, Wentworth Avenue, Southern Cross Drive, and the Eastern Distributor (M1); and
- the existing street-based network of O'Riordan Street or Bourke Road to Green Square and then via Wyndham Street and Gibson Street or Botany Road and Regent Street to the southern edge of central Sydney.

The airport and the T2/T3 precinct in particular is well served by public transport – a fact that is helping to increase the mode share of rail and bus services as means of access to and from the airport. Public transport in 2012 accounted for 17 per cent of total trips to the airport. This share has been increasing by one percentage point annually over the past five years and is anticipated to continue to increase at that rate to 2018.

The Airport Rail link – accessed at the Domestic underground station some 400 metres to the west of the project area – forms part of City Rail's East Hills line. Connection to the whole City Rail and regional Train Link network is available at Central Station. Sydney Buses' 400 route from Burwood to Bondi Junction directly serves the T2/T3 precinct.

The suburbs between the airport and central Sydney such as Mascot, Rosebery, Alexandria and Green Square have been undergoing redevelopment and intensification of land use and population for many years in response to a range of factors such as:

- redevelopment of redundant brownfield sites as industry moves to more appropriate locations elsewhere in the metropolitan area;
- an increasing demand for apartment living; and
- State Government planning policy focusing high density development in proximity to rail stations such as Green Square and Mascot (suburb) on the Airport Link rail line.

This residential and commercial redevelopment has increased demand for transport services along the regional arterial roads and rail networks that access the airport.

Another defining feature of the airport's location is its proximity to NSW Port's Port Botany container terminal – Australia's second busiest container port. Port Botany has recently undergone a major expansion which resulted in the provision of a third container terminal and a number of local road access improvements. While Port Botany has direct road access to the metropolitan orbital network via Foreshore Road, a lot of port-related and other heavy vehicles use the arterial road network in the immediate vicinity of the north-east precinct of the airport – General Holmes Drive, Joyce Drive, Qantas Drive and O'Riordan Street.

Given its location in the inner south east of the Sydney metropolitan area, the airport is well served by the RMS metropolitan arterial road network. Via Qantas Drive, Airport Drive and Marsh Street around its northern boundary, the T2/T3 precinct is directly connected to the M5 Freeway which provides access to the south-western suburbs and, at Prestons, joins the M7 (the metropolitan ring road to the north) and the M31, which is the Hume Freeway serving the southern inland regions of NSW. An alternative connection to the M5 from the T2/T3 precinct is provided via Joyce Drive and General Holmes Drive, which provides direct access to the M5 at the south-western corner of the airport on the northern bank of Cooks River.

A distinctive regional environmental feature of the airport is that extensive sections of its boundary are formed by waterways – Alexandra Canal to the north and Cooks River to the west, by the Sydney Wetlands and Mill Stream to the south-east and the extensive maritime environment of Botany Bay to the south. The Towra Point Conservation Reserve in the south-west of Botany Bay is a declared Ramsar[54] wetland site of international importance. This maritime setting gives considerable visual exposure of the airport from areas including the foreshores of Botany Bay along Foreshore Drive to the south-east and Grand Parade to the south-west.

Specific regional environmental characteristics that inform particular environmental assessments are addressed in the relevant sections of Chapters 7, 8 and 9.

54 The Convention on Wetlands (Ramsar, Iran, 1971) – called the 'Ramsar Convention' – is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their wetlands of international importance and to plan for the wise use, or sustainable use, of all of the wetlands in their territories.


Coaches
Nikon

Chapter 7

Traffic and Transport Assessment

CHAPTER

7 / TRAFFIC AND TRANSPORT ASSESSMENT

KEY POINTS

- The proposed ground access solutions result in improved road and intersection performance in and around Sydney Airport in 2018 and beyond.
- Modelling of traffic in the wider airport precinct and T2/T3 precinct was undertaken to identify benefits, longevity and likely impacts of the proposed development when complete. Various modelling methods were undertaken to analyse both regional and local future traffic conditions.
- Results of the analysis indicate that in 2018, with the proposed development in place, the capacity of the Qantas Drive corridor will increase and intersection operating conditions will improve.
- The Ground Transport Interchange will cater for all existing and proposed new public bus services along with private coaches and minibuses. The road network design has been undertaken to cater for a range of bus types and will ensure greater reliability of journey times.
- An above-ground pedestrian corridor between the terminals and the Ground Transport Interchange with assisted walkways through the new P1 East car park and bridge links between P2-P3 and P3-Ground Transport Interchange will provide a safe and user friendly route that has minimal conflict with vehicles.
- Approximately 200 additional taxi storage spaces, representing an increase of over 50 per cent, will provide greater capacity during peak hours and reduce congestion related to overflow of the existing taxi storage facility on Sir Reginald Ansett Drive.
- The additional vehicle storage with improved way-finding will increase the airport's capacity to meet the forecast growth in passengers.
- The development provides for an improved pedestrian and cyclist experience with dedicated shared paths, amenities, safe road crossings and clear signage that are better linked to existing cycle/pedestrian pathways in the vicinity of the airport.
- The assessment identified potential or unavoidable construction and operational traffic impacts of the proposed development. However, through various mitigation measures such as a construction traffic management plan the residual impact would be either low or low to moderate.
- Sydney Airport is committed to on-going community and stakeholder engagement during the construction phases of the proposed T2/T3 Ground Access Solutions and Hotel to ensure the impacts of construction are understood by all and managed accordingly.

SYDNEY AIRPORT'S GROUND ACCESS SOLUTIONS WILL MAKE IT EASIER FOR AIRLINE PASSENGERS AND OTHER AIRPORT USERS TO TRAVEL TO AND FROM THE AIRPORT BY CAR, TAXI, ACTIVE OR PUBLIC TRANSPORT. THIS CHAPTER REPORTS ON THE EXISTING TRAFFIC CONDITIONS, THE MODELLING UNDERTAKEN AND THE OUTCOMES FOR THE ON-AIRPORT AND NEARBY TRAFFIC NETWORK.

7.1 Traffic and transport assessment overview

A traffic and transport assessment was undertaken by AECOM and details of the assessment are presented throughout this chapter.

It was assessed that the proposed network configuration will be able to support the forecast volume of traffic in 2018 with an improved level of service from that experienced in the base year, 2012. This will enable the precinct's road network to be 'unlocked' and result in improvements in performance and reliability for all ground access modes using the precinct.

The key traffic and transport benefits of the proposed development are:

- increase the capacity of the airport to cater for the forecasted growth in passengers;
- improved intersection operating conditions around the T2/T3 precinct that will provide greater reliability;
- provision of a high standard Ground Transport Interchange to improve existing and accommodate expanded future bus operations;
- enhanced passenger infrastructure linking the terminals with the Ground Transport Interchange;
- improved performance, efficiency and reliability for all airport users accessing T2 and T3;
- improved pedestrian experience with a dedicated above ground pedestrian corridor including assisted walkways where feasible, will minimise conflict with vehicle traffic;
- expanded storage areas for taxis to accommodate existing/future demands; and
- improved legibility of the internal road network and separation of entry/exit flows for greater efficiency.

The assessment identified potential or unavoidable construction and operational traffic impacts of the proposed development. However, through various mitigation measures such as a construction traffic management plan the residual impact would be either low or low to moderate.

7.2 Existing traffic and transport context

7.2.1 Scope of the transport assessment

The proposed T2/T3 Ground Access Solutions and Hotel (as described in Chapter 4) will enable Sydney Airport, in close collaboration with the NSW Government (see Chapter 5), to improve road and intersection performance in and around the T2/T3 precinct by 2018 and beyond consistent with the ground access proposals presented in Master Plan 2033.

A traffic and transport assessment was undertaken to review the impacts of the proposed development on internal operations within the landside area of the T2/T3 precinct and the surrounding road network to evaluate road infrastructure improvements to accommodate future growth (see **Figure 7.1**). This investigation is reported in Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development Plan – Traffic and Transport Assessment[55]. Key findings of this investigation are presented below.

7.2.2 Existing traffic operations

The existing road layout in the eastern section of the T2/T3 precinct is generally described in Section 4.1 and shown on **Figure 4.1**.

Most inbound vehicles enter the precinct via Sir Reginald Ansett Drive and continue on to Keith Smith Avenue to gain access to the frontages of T2 and T3 at both the arrivals and departures levels. This corridor within the precinct accommodates all vehicle types including taxis, limousines, buses and private vehicles and is subject to congestion at peak times. Vehicles exit via Shiers Avenue with onward connections to Ninth Street, Sir Reginald Ansett Drive and Ross Smith Avenue to gain access to the wider road network beyond the airport boundary.

Car parking within the precinct includes the P1 parking structure at the western end of the horseshoe, the P2 parking structure between Fifth Street and Seventh Street and the P3 parking structure on the eastern side of Seventh Street.

55 AECOM 2014a

Figure 7.1 Sydney Airport and surrounding roads

Source © AND, © MapData Sciences Pty Ltd, PSMA © 2014 Microsoft Corporation

Within the project area, Ninth Street serves as an access for the Mercedes-Benz car showroom, the rental car quick turnaround (QTA) facility and rental car storage.

Ross Smith Avenue provides access to Sir Reginald Ansett Drive to the west and Lords Road to the east. It services a range of airport-related businesses and some airport patrons. While not formally signposted as an entry to the T2/T3 precinct on General Holmes Drive, it is used by regular airport users. Ross Smith Avenue is an important route for the shuttle buses that connect the Blu Emu long term car park in the south-east sector of the airport and the passenger terminals.

O'Riordan and Robey Streets are located to the north of the precinct (outside the airport boundary) and form a triangle with Qantas Drive. The three intersections with traffic signals that connect these roads are linked in phasing and timing to co-ordinate the road network.

Traffic signals are also provided at the intersection of Sir Reginald Ansett Drive and Ross Smith Avenue, primarily to facilitate right-turning vehicles from the precinct into Ross Smith Avenue and onwards to the south-east sector of the airport. These signals are important as vehicles exiting the precinct have no other means to gain access to the south-east sector. Vehicles are not able to turn right from Joyce Drive at the intersection with Lords Road and General Holmes Drive.

7.2.3 Existing intersection operating conditions

Level of service was calculated using the delay bands as specified in **Table 7.1**, which is consistent with the Modelling Guidelines[56].

The existing (2012) level of service is provided for key intersections within and beyond the project area for the busiest hours in **Table 7.2**.

The traffic demand through the intersections of Joyce Drive and O'Riordan Street, Mill Pond Road and Botany Road, and Mill Pond intersections (combined) is either approaching or exceeds capacity during both morning and afternoon peak periods in the 2012 base scenario.

All other intersections perform at level of service C or better in the base year (2012) models.

7.2.4 Landside precinct modal operations

In addition to private vehicles, a wide range of transport modes operate within and through the T2/T3 precinct. The operation of the main modes which are considered in the assessment of the proposed development are described below.

56 Roads and Maritime Services 2013

Table 7.1 Level of service indication and description

Level of service (LoS)	Average delay per vehicle (sec/veh)	Description
A	< 14	Good operation
B	15-28	Good with acceptable delay
C	29-42	Satisfactory
D	43-56	Operating near capacity
E	57-70	At capacity; at signals, incidents will cause excessive delays
F	> 70	Extra capacity required

Source Roads and Maritime Services 2013

Table 7.2 Key intersections – level of service and delay in seconds (2012)

	2012 AM		2012 PM	
Intersection	7.00–8.00	8.00–9.00	16.30–17.30	17.30–18.30
King Street and O'Riordan Street	A (13s)	A (12s)	A (12s)	A (15s)
O'Riordan Street and Robey Street	C (29s)	C (38s)	C (35s)	C (40s)
Qantas Drive and Robey Street	B (27s)	B (25s)	B (28s)	C (31s)
Joyce Drive and O'Riordan Street	E (69s)	F (71s)	F (73s)	F (94s)
Sir Reginald Ansett Drive and Ross Smith Avenue	B (18s)	B (19s)	B (17s)	A (14s)
General Holmes Drive and Joyce Drive	B (24s)	C (29s)	B (28s)	B (26s)
Mill Pond Road and General Holmes Drive	C (40s)	C (42s)	C (38s)	C (35s)
Mill Pond Road and Botany Road	E (59s)	E (59s)	F (87s)	E (66s)
Mill Pond intersections (combined)	E (60s)	E (59s)	E (85s)	E (66s)
Wentworth Avenue and Botany Road	C (29s)	C (31s)	C (32s)	B (28s)
Wentworth Avenue and General Holmes Drive	–	–	–	–

Source AECOM 2014a based on micro-simulation modelling (Commuter)

*The average delay of Mill Pond Road/General Holmes Drive and Mill Pond Road/Botany Road when the delays on Mill Pond Road are ignored. Mill Pond Road can be argued to act as internal arms rather than approaches.

Public transport

Public buses

T2 and T3 are served by the Burwood to Bondi Junction service (Route 400) which runs at a 20 to 25 minute headway throughout the day. Bus stands are provided for all services at ground level on Shiers Avenue adjacent to the T3 terminal.

The Rockdale to Bondi Junction service (Route 410) operates along Airport Drive but does not enter or stop within the T2/T3 precinct. The closest stop is located on Qantas Drive near Lancastrian Road, approximately 1.6km from the T3 frontage.

Airport buses

The Blu Emu Express runs a constant loop between the Blu Emu car park located in the south-east sector of the airport and T2 and T3. The bus uses Ross Smith Avenue to connect to Sir Reginald Ansett Drive.

The TBus service uses Airport Drive to travel between the T1 and T2/T3 precincts to drop off and pick up passengers and staff.

Private buses

Other private buses operating to and from the terminals, including hotel shuttle services, staff/crew services, off-airport parking shuttle services and coaches, drop off their passengers on the departures roadway above ground immediately outside both T2 and T3. Buses returning to pick up their passengers at the arrivals level are required to circulate using the U-turn facility at the eastern end of Shiers Avenue. These buses can then pick up at one of the bus loading bays located at the ground level at the end of the horseshoe between T2 and T3.

Taxis

Taxis dropping passengers at T2 and T3 enter via Sir Reginald Ansett Drive before proceeding to the drop-off areas on the above ground departures roadway. Taxis can then either circulate to the storage area via Shiers avenue and the U-turn facility to Sir Reginald Ansett Drive or exit the precinct. There are currently 330 taxi bays in the storage area located south of Keith Smith Avenue between Seventh and Ninth Streets.

Taxis arriving in the precinct with no passengers proceed directly to the storage area via the roads on the northern and southern side of Sir Reginald Ansett Drive. The road to the north enables use of the UniGas refuelling facility and then use of the underpass of Sir Reginald Ansett Drive to access the storage area. The taxi storage area is currently operating at or exceeding practical capacity during peak hours. Taxis queuing to enter the storage area at this time often queue through the underpass and trail onto Sir Reginald Ansett Drive, causing delays and tighter weaving areas for other motorists accessing the airport.

Taxis picking up passengers are marshalled from the storage area and meet passengers at the taxi ranks adjacent to T2 or T3 at ground level.

Rail

T2 and T3 have a dedicated train station entrance for the Airport Link and East Hills line on the City Rail network located within and under the P1 car park. This mode has little or no impact on surface level ground traffic issues.

Active transport – cycling and walking

Cycling

Bicycle access to the T2/T3 precinct is available for airport staff and visitors. End of trip facilities including bicycle racks are located to the east of Fifth Street, north of the P2 car park. However, there are currently no dedicated off-road cycle connections from outside Sydney Airport's boundary into the precinct. None of the roads in the area tend to have wide lane provisions for cyclists and there are no shared paths. Cyclists may currently use footpaths to access the precinct, which is not permitted for independently travelling adults under NSW road rules[57].

The Alexandra Canal cycleway is located to the west along Qantas Drive, about 1.5km from the precinct. Although there is a pathway on the northern side of Qantas Drive that connects to this route, it is not a designated cycleway.

Walking

Pedestrian facilities in the precinct provide an active means of transport for those located within walking distance of the airport or who use public transport services operating near the precinct. There are a number of formalised pedestrian facilities for people walking to and from the airport. There are pedestrian crossings with signals located at the following intersections:

- O'Riordan Street and Robey Street – on all approaches;
- Qantas Drive and Robey Street – on the eastern approach;
- Joyce Drive and O'Riordan Street – on the southern and western approaches; and
- Sir Reginald Ansett Drive and Ross Smith Avenue – on the eastern approach.

These facilities cater for pedestrians approaching the T2/T3 precinct from the north or east. From the west, there is a footpath on the northern side of Qantas Drive, which extends from Robey Street to about 170 metres west of Lancastrian Road. An informal walkway provides an onward connection with the Alexandra Canal cycleway and, ultimately, T1 as well as a pedestrian route from the bus stop near Lancastrian Road to Robey Street.

Access to the T2/T3 precinct from the pedestrian paths on Sir Reginald Ansett Drive or Ninth Street requires crossing a number of priority controlled intersections using pedestrian islands that divide inbound and outbound vehicles. At these intersections, pedestrians do not have priority and need to give way to turning vehicles.

The P3 car park is located on the eastern side of Seventh Street. For access to T2/T3, pedestrians are currently required to cross Seventh Street via a marked crossing and then proceed through the P2 and P1 car parks along pathways that are not direct, involve changes in level and are not entirely protected from the weather.

Private vehicles

The roads within the T2/T3 precinct are generally signposted at 40km/h with the drop-off plazas and multi-storey car parks signposted at 20km/h. The U-turn facility for eastbound traffic on Shiers Avenue is restricted to authorised vehicles and taxis only so private vehicles are required to exit and re-enter the precinct if they wish to recirculate.

Parking

The T2/T3 precinct is served by three multi-storey car parks (P1, P2 and P3) that currently provide approximately 4,400 parking spaces serving public, valet and rental cars. These parking facilities provide short and long term parking options for passengers and visitors.

The Blu Emu car park, which is in the south-east sector of the airport, is connected to the T2/T3 precinct along Ross Smith Avenue and generally provides long-term parking. This car park has about 6,000 parking spaces.

A number of private parking areas are in the T2/T3 precinct for use by airlines or airport staff. These areas are outside the horseshoe, variously on Fifth, Sixth, Seventh and Ninth Streets.

57 BicycleInfo NSW, 2014

Rental cars

Rental car drop-off and pick-up facilities are currently located in the P1 car park. Entry and exit to the car parks are via the routes for public vehicles, marked by overhead gantry signs by operator or company. The rental car companies have access to a quick turnaround (QTA) facility on the eastern side of Ninth Street, which provides refuelling, washing and vacuuming facilities that are primarily accessed during off-peak times. Rental car storage spaces – in addition to those provided in the three multi-storey car parks – are on the eastern and western side of Ninth Street.

Other private modes

Other private modes – short term free passenger pick-up, kerbside drops and limousines and valet parking – all access the horseshoe system and use a variety of specific-purpose and/or general access facilities.

7.2.5 Other traffic-generating land uses

Within and beyond the project area, the following adjacent land uses have particular traffic generating characteristics:

- Qantas Freight, formerly known as Australian Air Express;
- Mercedes-Benz showroom;
- Businesses on Ross Smith Avenue; and
- Gate 1 on Qantas Drive.

7.2.6 Freight routes

Given the proximity to the Sydney CBD, Port Botany and industrial facilities in Beaconsfield-Alexandria-Waterloo, the road network serving the T2/T3 precinct caters not only for air freight but also for strategic freight generated at Port Botany using the adjacent road network. A number of 25-26 metre B-double restricted-access vehicle routes apply to all the major roads surrounding the airport; including General Holmes Drive, and the Joyce Drive, Qantas Drive and Airport Drive corridor.

The primary route in the area for port-generated traffic is Port Botany, Joyce Drive, O'Riordan Street and Alexandria, which leads to a large proportion of heavy vehicles turning right from Joyce Drive into O'Riordan Street – through the main intersection providing access to and from the T2/T3 precinct.

Table 7.3 Construction period traffic impacts

Project	Nature and location of works	Construction traffic characteristics
1	Construction and connection of Seventh Street extension	For the most part, this construction can occur independently of landside airport traffic operations. However, tie-in of this roadway with Shiers Avenue will need to be carefully managed. On opening of the Seventh Street extension, the majority of exiting traffic will be directed towards Robey Street and, as a result, remove a substantial volume of traffic from the eastern section of Shiers Avenue, allowing other works to commence.
2	Expansion of P3, above grade connection between P2 and P3 and new lifts for P2	The expansion of P3, to add three additional floors to the top of the car park, is also unlikely to have an impact on precinct operations. Most work would be able to occur during airport operational hours, although the timing of deliveries by large construction vehicles would have to be carefully scheduled.
3	Construction of new P1 East structure	Demolition and reconstruction of the P1 East Car Park will need to be carefully managed given its premium location in the precinct. Construction traffic will be able to access the worksite via Fourth Street and Fifth Street. Most work would be able to occur during airport operational hours, although the timing of deliveries by large construction vehicles would have to be carefully scheduled. The loss of parking spaces in the precinct during the construction period, which will only be partially offset by the additional spaces provided in the expanded P3.
4	Construction of Ground Transport Interchange	This construction will mainly occur within the site area independent of landside airport traffic operations and should not have a detrimental effect on ground traffic operations in the T2/T3 precinct.
5	Augmentation and reconfiguration of some of T2/T3 precinct's major roadways	As this project work will be undertaken on operational roadways, it will need to be carefully staged and managed so that impacts on the road network operations are minimised.
6	Alteration of Qantas Drive eastbound (north side)	These works will need to be carefully staged and managed so that impacts on the road network operations are minimised for airport and non-airport traffic
7	Construction of the proposed hotel	This construction will mainly occur independent of landside airport traffic operations and, as a result, should not have a detrimental effect on operation of the T2/T3 precinct.

7.3 Impact assessment – construction and operation

7.3.1 Construction period traffic impacts

Construction of the T2/T3 Ground Access Solutions and Hotel is expected to occur progressively in an overlapping manner with Projects 1-3 to start as soon as possible after the MDP is approved and considering project dependencies. The commencement of construction for Projects 4 to 7 in particular will be assessed based on forecast demand for the capacity in combination with the completion of the WestConnex Enabling Works to be undertaken by the NSW Government. Sydney Airport will continue to work closely with the NSW Government and its transport agencies to ensure a timely and coordinated development program.

As a result, construction impacts will vary depending on the phase of work, its timing and its location. Some construction work, where it will not impact on existing precinct operations, will occur 24 hours a day whereas other project work may need to occur overnight (during curfew hours).

As shown in **Table 7.3**, each discrete construction project will have particular characteristics that will influence whether it is likely that there would be any impacts on the local airport traffic system and, if so, the nature of such impacts.

As noted in Section 4.8.3, a peak workforce of about 500 is anticipated. Assuming that 50 per cent of the peak construction workforce may undertake a shift change at the same time and that every worker has their own private vehicle, this would equate to 500 arriving/departing vehicles during the peak hour. Modelling (using Commuter) and analysis shows that the road network would have sufficient capacity to support these movements during non-peak periods (06.00-08.00, 09.00-10.00, 16.30-18.30).

7.3.2 Operational period

Traffic modelling

Modelling of traffic in the wider airport precinct and T2/T3 precinct was undertaken to identify likely impacts of the proposed development when complete. Various modelling methods were undertaken to analyse both regional and local future traffic conditions.

A demand model was used to generate a base year (2012) volume profile that replicated observed traffic flows in relation to passenger movements. From this, a micro-simulation model was developed to replicate 2012 traffic volumes and performance for operational assessment purposes. These base year models were verified by RMS and were regarded as fit for purpose.

Future year demand and forecasted traffic were obtained from a combination of Sydney Airport's forecasts of airside passenger demands and outputs from the RMS Sydney Highway Assignment (SHA) model, from which network demands were extracted. These demands were used to model the forecast future performance under the Five Year Ground Transport Plan presented in the Master Plan 2033 and post-opening (beyond 2018) scenarios using micro-simulation and corridor modelling.

The Master Plan 2033 makes provision for co-location of domestic and international flights at both T1 and T2/T3. For the purpose of this assessment, it was assumed that co-location in either location will not have occurred by 2018.

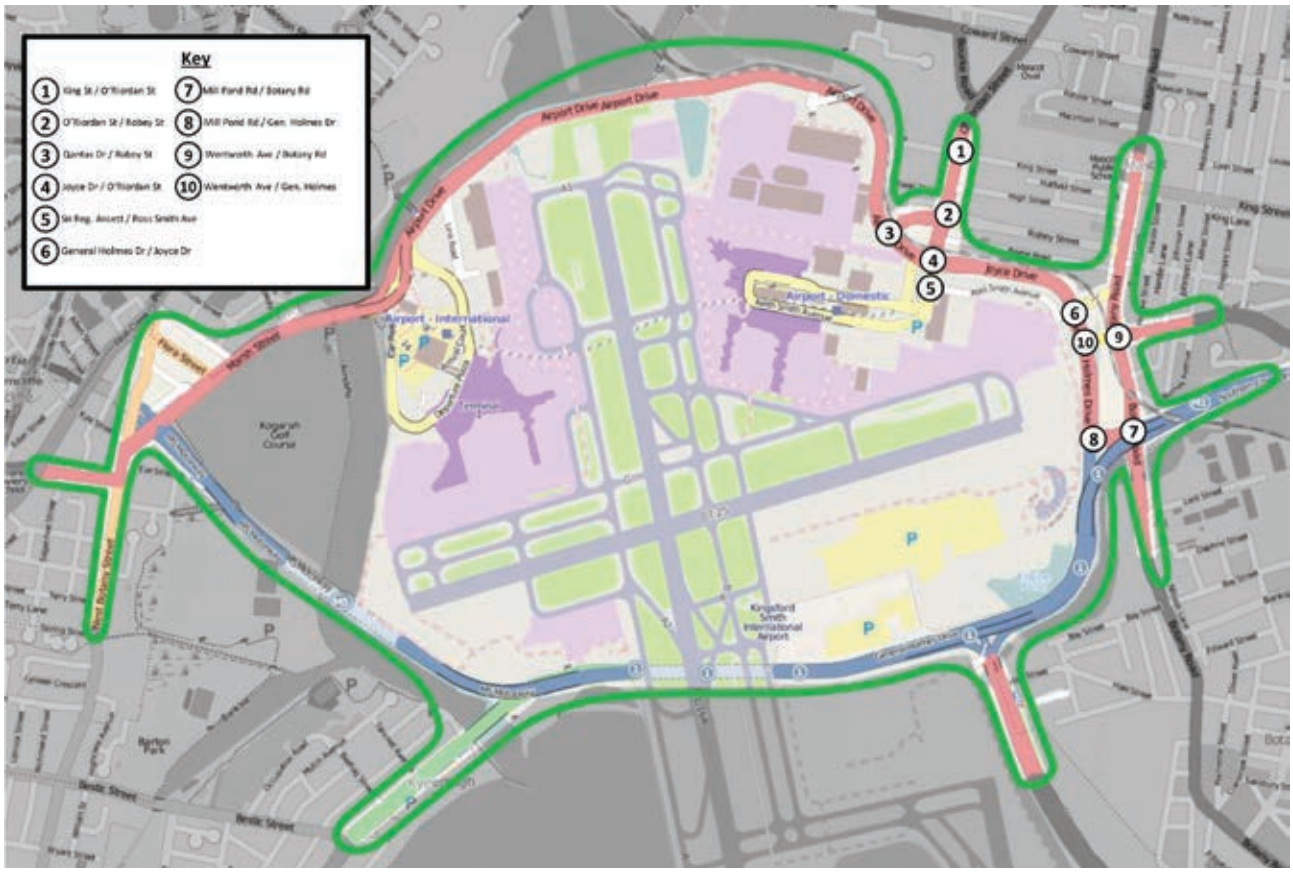
Table 7.4 presents the scenarios that were assessed in the preparation of this MDP.

Operational impacts were assessed by comparing the 2018 'do nothing' scenario (no infrastructure changes have been made to the current network) with the 2018 MDP scenario (includes the proposed infrastructure works). Both scenarios were assessed in traffic-modelling software called Commuter, which compared both future traffic flows on key links and levels of service (traffic volume weighted average delay in seconds) at key intersections. This

Table 7.4 Scenarios assessed

Scenario name (software used)	Details
2012 Base (Commuter)	2012 base year
2018 Do Nothing (Commuter)	2018 demands with no infrastructure changes
2018 MDP (Commuter)	2018 with MDP infrastructure + network wide upgrades
2023 MDP+ (LinSig)	2023 demands with MDP infrastructure plus any upgrades required to achieve satisfactory performance
2028 MDP+ (LinSig)	2028 demands with MDP infrastructure plus any upgrades required to achieve satisfactory performance
2033 Master Plan (Commuter)	2033 demands with 20 year ground transport plan (MP2033) infrastructure and WestConnex

Figure 7.2 Commuter model area and assessed intersections



Source: © OpenStreetMap contributors, with edits by AECOM, 2014

modelled area and the intersection locations that have been assessed in this report are shown in **Figure 7.2**.

Results of the analysis indicate that in 2018 with the proposed development in place, traffic flows on Qantas Drive grow with increased capacity created in the corridor while improving intersection operating conditions.

In contrast to the 2018 'do nothing' base link flows, Qantas Drive eastbound, O'Riordan Street southbound, and Joyce Drive westbound all carry more traffic and experience growth when compared with the 2012 base year link flows. This growth indicates an increase in the capacity of the road infrastructure compared with the existing operations.

Level of service

The results of the level of service (LoS) analysis for selected intersections in and around the project area are presented in **Table 7.5**.

2018 'do nothing' scenario

In the 2018 'do nothing' scenario, LoS indicates that a number of intersections perform above practical operational capacity with levels of E or F.

The O'Riordan Street and Robey Street as well as the Joyce Drive and O'Riordan Street intersections are among the worst performing, with the average delay ranging from 70 to 120 seconds during peak periods. Most intersections in the morning peak are performing at or above practical capacity with the exception of Sir Reginald Ansett Drive and Ross Smith Avenue as well as Qantas Drive and Robey Street.

Queues observed in the Commuter model extend beyond the model study area and result in unreleased vehicles from O'Riordan Street. In both peak periods, queues are forecast to extend for kilometres north of King Street and will interfere with the operation of intersections to the north. Due to the large queues in this scenario, it is likely that vehicles would change their travel behaviour to avoid the congestion. Traffic performance reliability would likely decrease.

2018 MDP scenarios

The 2018 MDP scenario performs at LoS D or better for all intersections beyond the T2/T3 precinct within the modelled area. All major approaches to this precinct – O'Riordan Street, Qantas Drive, Joyce Drive, Robey Street between Qantas Drive and O'Riordan Street – perform at LoS D or better. Queues on these approaches generally clear each cycle. That is, future intersection performance of surrounding intersections would be far better compared

Table 7.5 Summary of intersection performance results for each modelled year

Intersection	2012	2018 DN	2018 MDP	2023 MDP+	2028 MDP+	2033
Morning peak hour – 7:00–8:00am						
1. King Street / O'Riordan Street	A (13s)	E (67s)	A (15s)	B (26s)	B (28s)	B (17s)
2. O'Riordan Street / Robey Street	C (29s)	F (97s)	B (29s)	B (18s)	B (19s)	B (25s)
3. Qantas Drive / Robey Street	B (27s)	C (42s)	C (43s)	D (48s)	C (40s)	C (40s)
4. Joyce Drive / O'Riordan Street	E (69s)	F (83s)	C (41s)	D (49s)	C (30s)	D (45s)
5. Sir Reginald Ansett Drive / Ross Smith Avenue	B (18s)	B (20s)	B (18s)	C (36s)	B (28s)	A (9s)
6. General Holmes Drive / Joyce Drive	B (24s)	D (52s)	B (23s)	C (40s)	D (43s)	C (40s)
7. Mill Pond Road/General Holmes Drive	C (40s)	E (61s)	C (36s)	–	–	D (45s)
8. Mill Pond Road / Botany Road	E (59s)	E (67s)	D (44s)	–	–	E (58s)
Mill Pond intersections combined	E (60s)	F (81s)	C (43s)	–	–	D (55s)
9. Wentworth Avenue / Botany Road	C (29s)	F (86s)	D (44s)	–	–	D (54s)
10. Wentworth Avenue / General Holmes Drive	–	–	B (25s)	–	–	D (49s)
Afternoon peak hour – 16:30–17:30pm						
1. King Street / O'Riordan Street	A (12s)	E (67s)	A (15s)	C (34s)	C (32s)	B (20s)
2. O'Riordan Street / Robey Street	C (35s)	F (83s)	B (29s)	B (27s)	B (17s)	B (21s)
3. Qantas Drive / Robey Street	B (28s)	C (34s)	C (43s)	C (33s)	B (28s)	C (37s)
4. Joyce Drive / O'Riordan Street	F (73s)	F (74s)	C (41s)	C (38s)	C (33s)	D (46s)
5. Sir Reginald Ansett Drive / Ross Smith Avenue	B (17s)	B (20s)	B (18s)	B (24s)	B (20s)	A (14s)
6. General Holmes Drive / Joyce Drive	B (28s)	C (38s)	B (23s)	D (44s)	D (43s)	B (28s)
7. Mill Pond Road / General Holmes Drive	C (38s)	D (45s)	C (36s)	–	–	C (31s)
8. Mill Pond Road / Botany Road	F (87s)	D (47s)	D (44s)	–	–	C (47s)
Mill Pond intersections combined	E (85s)	E (64s)	C (43s)	–	–	C (42s)
9. Wentworth Avenue / Botany Road	C (32s)	C (41s)	D (44s)	–	–	D (44s)
10. Wentworth Avenue / General Holmes Drive	–	–	B (25s)	–	–	C (41s)

Source AECOM, 2014a (based on microsimulation modelling)

with the 2018 'do nothing' option with the MDP proposals and surrounding road network improvements in place.

The combined Mill Pond intersections would continue to operate at LoS E in the 7.00 to 8.00am period but otherwise performs at LoS D or better. This is due to large demands from Southern Cross Drive (E) and General Holmes Drive (S) heading westbound on General Holmes Drive and Joyce Drive.

Modelling of the +5, +10 and +15 (beyond 2018) year scenarios shows that the proposed road infrastructure is viable over the longer term. The assessment indicates that intersection delays can be maintained at LoS D or better with the inclusion of the following works by the assessment years:

- 2023 – widening of O'Riordan Street southbound to three through lanes between Robey Street and Joyce Drive (off-airport land);
- 2028 – provision of a grade-separated link between Qantas Drive and the Ground Transport Interchange (as defined in Master Plan 2033); and
- 2033 – implementation of the complete ground access strategy presented in the Master Plan 2033.

Modelling of the proposed road infrastructure demonstrates that it will provide a long term solution to operational efficiency that will provide traffic performance reliability

58 AECOM 2014a

during the years 2018, 2023, 2028 and 2033. Further information on future operating conditions can be found in the appendices to the Traffic and Transport Report[58].

Impact on access by mode

The proposed road infrastructure works located in the landside area of the T2/T3 precinct include new and reconfigured roadways, redevelopment of existing car park structures, a Ground Transport Interchange (including a ground level bus facility and multi-modal parking) and the proposed hotel.

The location of the Ground Transport Interchange will allow a number of existing user groups to access the T2/T3 precinct without the need to travel around the horseshoe. In turn, this will reduce demands circulating the frontages of T2 and T3.

The implementation of a one-way system through the development of a new exit road – the Seventh Street extension – will create a better distribution of traffic movements and improve overall network efficiency due to reductions in delay and simplification of the T2/T3 precinct's roadways.

As indicated in **Table 7.5**, the proposed network configuration will be able to support the forecast volume of traffic for 2018 with an improved LoS than experienced in the base year (2012). This will enable the precinct's road network to be 'unlocked' and result in improvements in traffic performance and reliability for all ground access modes using the precinct.

Public transport

Buses

The bus and coach facility within the Ground Transport Interchange will cater for all existing and new public bus services along with private coaches and minibuses. The road network design has been undertaken to cater for a range of bus types. However, some buses including Blu Emu, TBus and staff/crew buses will continue to access the horseshoe roadways between T2 and T3.

The bus and coach facility will provide a dedicated, safe and high quality facility that will be accessible to and from T2 and T3 via high quality above ground, all weather routes using the new pedestrian corridor connecting through P3, P2 and the new P1 East car park which will include assisted walkways.

The bus and coach facility will provide increased capacity for storing and waiting buses and, due to its position near the T2/T3 precinct's entry and exit roads, provide greater reliability of journey times. This is an important factor for TfNSW in determining the viability of providing new or re-routed services to the airport. These elements will provide an improved experience for bus and coach users and encourage and support an increase in the travel share of this mode to and from the airport into the future.

Taxis

The approximate 200 additional taxi storage spaces, representing an increase of over 50 per cent, will provide greater capacity during peak hours and reduce congestion related to overflow of the existing taxi storage facility on Sir Reginald Ansett Drive.

The dedicated taxi recirculation route will maintain travel times for taxi drivers returning to storage from departures. This route will also mean minimal conflict with other airport users, as is currently the case on Shiers Avenue and Sir Reginald Ansett Drive, which will result in lower delays. Additionally, if queues form for returning taxis, they will be isolated on minor roads with minimal conflict for other airport traffic. Additional storage will be provided when compared with the existing layout.

Rail

There are no proposed changes to access or exit for rail users and thus no impacts as a result of the proposed development.

Active transport

Pedestrians

The proposed pedestrian facilities will provide an improved experience for pedestrians entering and exiting the precinct by means of:

- connections into the Ground Transport Interchange and then access to the above-grade, dedicated pedestrian corridor that connects to T2 and T3 through the P3, P2 and the new P1 East car parks as previously described; and
- a dedicated pedestrian and cycle shared path on the western side of the Seventh Street extension to provide a direct connection between T2 and T3 and off-airport locations.

The proposed above-grade pedestrian corridor between T2 and T3 and the Ground Transport Interchange will also support other users of this facility, including valet, rental cars and public and hotel parking. This corridor will provide a safe and user friendly route designed to have minimal conflict with vehicles.

The proposed development, by the resumption of airside land, opens up pedestrian routes to and from the airport terminals and other nearby areas, the proposed Ground Transport Interchange and hotel development. Increasing the accessibility of these areas facilitates additional growth in active transport and pedestrian access, particularly from the growth area of Mascot.

Table 7.6 Proposed pedestrian improvements

Intersection	Scope of improvements
O'Riordan Street and Robey Street	Pedestrian crossings are proposed on all approaches. Staged pedestrian crossings are proposed on the northern approach allowing for vehicles to operate without filtering over any crossing. Full pedestrian access at this intersection will facilitate the two major pedestrian corridors – from O'Riordan Street to the Precinct via Robey Street and to the land uses along Sir Reginald Ansett Drive via the west side of O'Riordan Street.
Qantas Drive and Robey Street	The pedestrian crossing on the eastern approach is to be removed and replaced with a crossing on the western approach. A new crossing is proposed on the northern arm, which will facilitate pedestrian and cyclist access between Qantas Drive and Joyce Drive. The southern arm will have full pedestrian facilities, which will enable access to the Hotel development from the north and west. Placement of the crossing on the western approach also provides for greater connectivity between the pathway on the northern side of Qantas Drive and the proposed shared path on the western side of the Seventh Street extension providing the shortest path between the terminals from the north and west. For safety and capacity reasons, a pedestrian crossing on the eastern approach could not be accommodated as it would have a detrimental impact on intersection efficiency and require a staged, offset crossing arrangement.
O'Riordan Street, Joyce Drive and Qantas Drive	The existing pedestrian crossing on the western approach is proposed to be removed and replaced with a staged crossing on the eastern approach. This provides the shortest path for pedestrians from the north to Ross Smith Avenue and areas along Sir Reginald Drive. A new crossing is proposed on the northern arm will facilitate pedestrian and cyclist access between Qantas Drive and Joyce Drive. The existing crossing on the southern arm would be retained, which will facilitate access between the Ground Transport Interchange and commercial properties along Ross Smith Avenue. For safety and capacity reasons, a pedestrian crossing on the western approach could not be accommodated as it would have a detrimental impact on intersection efficiency and require a staged, offset crossing arrangement.
Sir Reginald Ansett Drive and Ross Smith Avenue	The pedestrian crossing on the eastern approach is retained. Crossing on the northern and southern arms is not proposed as these connections are not considered to be on pedestrian desire lines and suitable alternative access to the properties between Sir Reginald Ansett Drive and Ninth Street can be made from the pedestrian facilities at the O'Riordan Street, Joyce Drive and Qantas Drive intersection.. For connections between the internal area of the T2/T3 precinct and Ross Smith Avenue, pedestrians have the choice of pathways on the southern side of Sir Reginald Ansett Drive and Keith Smith Avenue or via the Seventh Street extension.
Ninth Street and Qantas Drive	Pedestrian crossings (zebra) will be provided on both the entry and exit slip lanes which will enable access to the Hotel development from the north and east.
Shiers Avenue	The existing pedestrian crossing will be replaced by a signalised pedestrian crossing to improve pedestrian and cyclist safety.

Pedestrian crossings at intersections

Each of the upgraded intersections will make provision for pedestrian crossings that will be developed in accordance with latest design standards during detailed design (see **Table 7.6** and **Figure 4.3**).

For all upgrades proposed at intersections with signals, RMS requires that accommodation be made for pedestrian crossings on all approaches. Any lack of provision or removal of pedestrian crossings should be justified on safety or capacity grounds. Locations where pedestrian crossings are not proposed in the design concept on all approaches on the grounds of safety and capacity are described in **Table 7.6**.

All of the slip lanes in the upgraded intersections are proposed to be signal controlled rather than priority (zebra) controlled. This arrangement reduces delays for vehicles and improves safety for pedestrians. Marked pedestrian crossings will be provided on the entry and exit lanes of Ninth Street.

Cyclists

The proposed development will improve access to the T2/T3 precinct and facilities for cyclists.

A dedicated pedestrian and cyclist shared path on the western side of the Seventh Street extension will provide a direct at-grade route for movements between T2 and T3

and off-airport locations. Using the crossings at the upgraded intersection of Qantas Drive and Robey Street, cyclists will be able to connect to pathways on Robey Street for access to the north, and the pathway on the northern side of Qantas Drive which ultimately connects to the Alexandra Canal cycleway and on to the growth areas of Mascot and Green Square.

Within the T2/T3 precinct, upgraded crossings on Shiers Avenue will provide a connection between the shared path and the existing bicycle racks in P2. In addition to improved shared path links planned as part of the proposed development, other facilities to promote cycling will include:

- undercover bicycle racks within the Ground Transport Interchange adjacent to P2 and P1 East car park to provide storage for at least 90 bicycles; and
- end-of-trip facilities including bicycle storage, showers, lockers and amenities which can be located under internal ramps within the Ground Transport Interchange and P1 East car park.

Private transport

Parking

When operational, redevelopment of existing car parks and the construction of the Ground Transport Interchange will increase the availability of parking spaces and, as a result, reduce time spent searching for available car spaces. The Ground Transport Interchange will also be the first parking offering within the T2/T3 precinct which will mean that motorists can access them quickly without the need to enter the horseshoe. This will result in improvements in traffic conditions and reliability for all ground access modes using the precinct by providing a convenient and easily accessible parking/storage location for vehicles entering the precinct.

Connectivity from the Ground Transport Interchange to Ninth Street will be provided so that departing westbound vehicles can exit directly onto Qantas Drive.

During the construction period for expansion of P3 (Project 2), parking spaces on the top two levels of this structure will not be usable for parking resulting in a temporary loss of approximately 250 spaces. This short-term reduction is not expected to cause a significant negative impact to the precinct's parking capacity.

The demolition of P1 East (Project 3) will result in the loss of approximately 800 existing parking spaces in this old structure which would be mitigated by the return of 680 spaces on completion of the P3 expansion (two unusable levels plus three new levels).

Additional parking options during the construction periods may include promoting use of the Blu Emu car park in the south east sector, with customers being able to use existing shuttle/transfer services to reach the precinct, or encouraging other travel modes such as public transport.

During the construction period, the short stay public pick up area, currently located at 4th street, may be relocated outside the project area.

Changes to other modes

No changes are proposed to rental car pick-up / drop-off in the P1 West car park. As part of increasing the capacity of the P1 East car park, the P1 West car park will be used for valet and rental car services. This will increase the amount of storage and reduce the amount of vehicles entering / exiting to move between storage areas.

This MDP does not propose any changes to kerbside drop off operations.

The Ground Transport Interchange will provide a new QTA and storage facility for rental cars so that these vehicles do not have to leave the T2/T3 precinct and create unwanted traffic movements on the network.

Access and recirculation routes will be retained for limousines and therefore no impacts have been identified for this mode. The proposed new at-grade service road on the northern side of the P2 car park will enable limousines, taxis and other airport operational vehicles to re-circulate along Shiers Avenue via Seventh Street. This roadway will provide a direct route to the Ground Transport Interchange, the hotel or the south side of Sir Reginald Ansett Drive. This means that these vehicles will avoid having to exit and re-enter the precinct and creating unwanted movements on the precinct's primary roadways.

No changes are proposed to valet operations.

Future conditions for on-airport businesses

Australian Air Express (AAE) building

Access to the AAE building will be retained on Fifth Street. Currently, exits from it are available onto Fifth Street or directly onto Shiers Avenue to the south-east of the building. The development of the Seventh Street extension will require removal of the exit directly on to Shiers Avenue. All vehicles will now use Fifth Street (to the west) for exit onto Shiers Avenue. Arrangements for heavy vehicles that use the loading docks on the eastern side of the building have been incorporated into the design to facilitate full access for all vehicle classes currently servicing the facility with those heavy vehicles.

Mercedes-Benz showroom

Access to the Mercedes-Benz showroom on the east side of Ninth Street will remain generally as currently provided with some minor modifications. The design concept provides for car transport vehicles with the inclusion of a dedicated layby on the eastern side of Ninth Street. These vehicles would be required to enter from the south and exit to the north (westbound) on Qantas Drive.

Commercial properties on Ross Smith Avenue

The proposed development does not include any changes to Ross Smith Avenue. However, due to the proposed road arrangements in the precinct, traffic will no longer be able to turn right from Sir Reginald Ansett Drive (northbound) into Ross Smith Avenue. Vehicles from the T2/T3 precinct will be required to exit on the Seventh Street extension and then return on Sir Reginald Ansett Drive (southbound) for left turns into Ross Smith Avenue. There are no proposed changes to exit routes from Ross Smith Avenue.

Pedestrian movements between T2/T3 and Ross Smith Avenue will be facilitated by the pathways on the south and eastern side of Sir Reginald Ansett Drive. Designated crossing at the northern end of Sir Reginald Ansett Drive and Ninth Street will provide connections between Ross Smith Avenue and the Ground Transport Interchange or Hotel.

Airport Gate 1, Qantas Drive

Due to the widening and realignment of Qantas Drive, a median is proposed on the western approach to the intersection with Robey Street (see **Figure 4.3**). As a

Table 7.7 Summary of traffic and transport impacts – construction and operation

Impacts – potential or unavoidable	Mitigation measures and further investigations	Level of residual impact
Construction period		
Construction impacts will vary depending on the phase of work and its location. While some components of work can be undertaken with no impact, others may cause localised impacts on some on-airport roads. Some construction work, where it will not impact on existing precinct operations, will occur 24 hours a day whereas other project work may need to occur overnight (during the airport's curfew period).	Where required, a construction traffic management plan (CTMP) will be prepared. The CTMP would mitigate the impact on airport and non-airport traffic by measures including: • defining appropriate extents of work, the timing and duration of construction activities, and movements of construction vehicles; • making accommodation for heavy vehicle access, parking and transport of site workers; and • staggering shift changes for the construction workforce and arrange these changes so that they occur outside of peak traffic periods.	Low to moderate
A reduction in available parking will be experienced during construction of the additional levels to P3 and the redevelopment of P1 East.	Where required, vehicles can be directed to off-precinct parking facilities and make use of existing shuttle/bus facilities to access the precinct.	Low
Operational period **Changes to access arrangements for on–airport businesses and facilities**		
AAE air freight – exit to Shiers Avenue used by heavy vehicles.	Alternative exit arrangements for heavy vehicles that use the loading docks on the eastern side of the building have been catered for with full access available to vehicle classes that currently service the facility.	Low
Mercedes-Benz car showroom – changes to access arrangements for car transportation vehicles.	The design concept makes provision for car transport vehicles with the inclusion of a dedicated layby on the eastern side of Ninth Street. These vehicles would be required to enter from the south via Sir Reginald Ansett Drive and exit to the north (westbound) via Ninth Street onto Qantas Drive.	Low
Gate 1 – right turns into and out of this gate will not be achievable under the proposed works. Access to this site from Qantas Drive will be limited to left-in, left-out movements only.	No mitigation measures proposed or required.	Low to moderate
Changes for travel time and distance for Port Botany heavy vehicle traffic		
Under the proposed development, northbound traffic from Joyce Drive will be diverted via Robey Street to O'Riordan Street, requiring navigation through an additional intersection and a slight increase in travel distance.	Better intersection operation and increased capacity through the corridor past the precinct will achieve a balance between the impacts of some rerouting of traffic with reduction in delays for airport and non-airport traffic moving more efficiently on the surrounding road network. Additional queue storage will mitigate current issues of spillback from right turning lanes.	Low to moderate

consequence, a right turn into and out of Gate 1 will not be achievable under the proposed works. Access to this site from Qantas Drive will be limited to left-in, left-out movements only.

Impact on freight movements

As described above, the assessment of the 'do nothing' 2018 scenario indicates that the road network will perform poorly without any road upgrades in place. Queues at the intersections surrounding the T2/T3 precinct are forecast to increase significantly, which will increase travel times.

One of the primary freight routes near the airport is between Joyce Drive and O'Riordan Street. These movements are currently facilitated at the Joyce Drive and O'Riordan Street intersection. These movements currently experience delays, which will continue to worsen without any road upgrades.

Under the proposed development, northbound traffic from Joyce Drive will be diverted via Robey Street, requiring navigation through one additional intersection and a slight increase in travel distance in the context of the immediate surrounding area.

However, the proposed road network will substantially improve performance and provide greater efficiency and reliability. As shown on **Table 7.5**, the proposed infrastructure will perform at LoS D or better, with queues clearing during most cycles. Therefore, northbound freight movements will be able to move through the intersections more efficiently with travel time savings for these vehicles. The reductions in delay due to improved intersection performance will more than offset the slight additional travel distance. Southbound movements from O'Riordan Street to Joyce Drive will benefit from improvements in throughput and reduced delays.

As part of the design the proposal creates an additional 160 metres of queue storage for northbound vehicles turning from Joyce Drive to O'Riordan Street via Robey Street. Therefore the current linear storage is increased by 84 per cent from 190 metres to over 350 metres, which, in addition to the efficiency benefits will assist in the expected growth in freight movements from Port Botany.

Future conditions for off-airport businesses

Stamford Plaza Hotel and office tower

As noted in Chapter 5, the scope of works outside the airport boundary is the responsibility of the NSW Government. Sydney Airport will continue to work with RMS and stakeholders to refine the overall design of works outside the airport boundary to provide appropriate access and exit arrangements for the existing hotel and commercial property and exit to the west from the underground car park on the west side of Robey Street.

Nevertheless, under the design as presented in the Master Plan 2033, access and exit from the Stamford Plaza Hotel would be altered but not impaired. Access to this hotel from the west and south from the airport will be improved via easy access and shorter travel time to its porte cochere northbound along Robey Street. Access from the east along Joyce Drive would be substantially the same requiring vehicles to turn right into Robey Street rather than right into O'Riordan Street and then left into Robey Street as required under the existing configuration. Access to the hotel from the north along O'Riordan Street would have a slightly longer travel time as vehicles would need to turn right into Qantas Drive and then right again into Robey Street to access the porte cochere.

Importantly, patrons, staff and suppliers to the Stamford Plaza Hotel and the office tower will experience less delay in contrast with the 'do nothing' scenario. The proposed development will enhance pedestrian connectivity between the hotel and commercial buildings and the airport precinct by shortening the travel distance, increasing safety and improving ease of access.

7.4 Mitigation measures

7.4.1 Construction period

Preparation of a construction traffic management plan (CTMP) will be undertaken during detailed design to assess the impacts associated with construction activities and the impacts of construction-related vehicles.

The CTMP would seek to mitigate the impact on airport and non-airport traffic by defining appropriate extents of work, the timing and duration of construction activities, movements of construction vehicles and making accommodation for parking and transport of site workers. The CTMP would also seek to stagger employee shift changes and arrange these changes so that they occur outside of peak traffic periods.

7.4.2 Operational period

As the proposed road improvements will provide long-term benefits by alleviating congestion and facilitate T2 and T3 to accommodate forecast growth in passengers over the 20 year master planning horizon, no mitigation measures are required or proposed for the operational period.

7.5 Outcomes of traffic and transport assessment

The traffic and transport impacts of the proposed development as identified in this assessment are summarised in **Table 7.7** below for the construction and operational periods.

Chapter 8

Environmental Assessment

CHAPTER

8 / ENVIRONMENTAL ASSESSMENT

KEY POINTS

- Sydney Airport recognises that its success can be enhanced by conducting business in a way that is environmentally, socially and economically responsible.
- Sydney Airport has assessed the environmental impacts of the proposed development, commissioning specialist assessments in relation to soil and groundwater contamination, surface water quality and hydrology, ground noise, air quality, hazard and risk, ecology and heritage.
- The assessments have considered the cumulative impacts of other developments which may have concurrent construction and/or operational periods.
- The assessments identified potential or unavoidable construction environmental impacts resulting from the proposed development. However, through various mitigation measures the residual construction impacts were assessed as ranging only between negligible to moderate. Operational impacts have been assessed as negligible to low.
- The proposed development will result in unavoidable heritage impacts. A heritage interpretation strategy will define and recommend a variety of interpretative methods and media to minimise this impact.
- The proposed development will deliver positive environmental improvements such as:
  - Promoting active transport through improvements to facilities and connectivity for cyclists and pedestrians;
  - Encouraging increased use of public transport with a high standard Ground Transport Interchange;
  - Road designs that reduce traffic congestion in the precinct, improving both air quality and noise impacts; and
  - Incorporation of sustainability measures into the detailed design of the proposed development to improve environmental outcomes such as resources efficient lighting and water recycling.
- Contractors engaged by Sydney Airport will be expected to comply with the environment strategy and the commitments of this MDP, submitting environmental management plans which are developed and implemented to reduce environmental risk and prevent or minimise environmental impacts.

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED T2/T3 GROUND ACCESS SOLUTIONS AND HOTEL HAVE BEEN ASSESSED AND A STRATEGY PUT IN PLACE TO MITIGATE THOSE IMPACTS. ENVIRONMENTAL IMPACTS ARE ASSESSED IN RELATION TO SOIL AND GROUNDWATER CONTAMINATION, SURFACE WATER QUALITY AND HYDROLOGY, GROUND NOISE, AIR QUALITY, HAZARD AND RISK, ECOLOGY AND HERITAGE. LIKELY IMPACTS DURING THE CONSTRUCTION PERIOD WILL BE MANAGED TO ACCEPTABLE LEVELS THROUGH A RANGE OF MITIGATION MEASURES INCORPORATED IN A PROJECT-SPECIFIC CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN.

Likely impacts during the construction period will be able to be managed to acceptable levels through a range of mitigation measures incorporated in a project-specific construction environmental management plan. Where there may be unavoidable adverse impacts, mitigation measures are proposed.

8.1 Environmental assessment overview

The outcomes of the environmental assessments for the T2/T3 ground access solutions and hotel concluded that the development is not likely to have significant environmental or ecological impact.

The key environmental benefits of the proposed development include:

- Improvements to facilities and connectivity for cyclists and pedestrians;
- Encouraging increased use of public transport by providing a high standard Ground Transport Interchange that caters for the additional public bus services to Sydney Airport announced by the NSW Government;
- Reducing air and noise impacts associated with traffic congestion by improving the road network in and around the airport;
- Reducing greenhouse gas emissions by the installation of a parking guidance system that increases the efficiency of vehicle circulation; and
- Incorporation of sustainability measures into the detailed design of the proposed development to improve environmental outcomes including:
  - Low emission technologies such as LED lighting;
  - Resource efficiency, including reusing existing materials for construction and using alternative construction materials such as material with recycled content; and
  - Water recycling such as within the rental car wash bay.

Sydney Airport recognises the assessments identified potential or unavoidable construction and operational environmental impacts resulting from the proposed development. However, through various mitigation measures such as archival recording of impacted buildings, preparation of a heritage interpretation strategy, and the development of a construction environment management plan, the residual impacts were assessed as ranging only between negligible to moderate.

8.2 Soil and groundwater contamination

A specialist investigation was undertaken to assess the potential for contamination on the project area based on review of past and present site use and site inspection to identify potential areas of environmental concern and to recommend further investigations and mitigation measures if required. This investigation is reported in Report on Preliminary Site Investigation of Contamination – Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development Plan[59]. Key findings of this investigation are presented below.

59 Douglas Partners 2014

8.2.1 Existing conditions

Geology

The 1:100,000 series Geological Map for Sydney and the accompanying notes indicate that the airport is underlain by man-made filling and Quaternary alluvium. The man-made filling is essentially dredged sand from various parts of Botany Bay or imported from other areas of the airport. However, the levels in the T2/T3 precinct have been essentially unchanged since the early 1950s, suggesting there is unlikely to be extensive dredged sand filling in this particular part of the airport.

The Quaternary alluvium around Botany Bay is predominantly of a marine origin deposited in an open tidal estuarine environment. Soft mud deposits are extensive over the entire airport site with the deepest deposits, noted during previous investigations near the Northern Pond in the western part of the Jet Base. These soft mud deposits are fine-grained soils which have formed behind aeolian sand barriers around the foreshores of Botany Bay.

Acid sulphate soils

The Acid Sulphate Soil Risk Map for Botany Bay[60] indicates that the airport is underlain by filling (disturbed terrain) for which no specific information is available on acid sulphate soils (ASS). Botany Bay and Cooks River are highlighted as having a high probability of ASS occurrence and severe environmental risk if bottom sediments are disturbed by activities such as dredging. This soil type has the potential to be encountered across the project area given the potential historic filling of the site with dredged sand from Botany Bay.

Surface water and groundwater

Most stormwater at the project area is expected to flow towards the north-west, entering the Northern Pond and Alexandra Canal, which drains into the Cooks River and Botany Bay. This flow will be either as run-off or directed flows via stormwater drains.

Groundwater under the project area is similarly expected to flow to the north-west and eventually enter Cooks River and Botany Bay.

A review of the NSW Groundwater Works database[61] showed that there are numerous groundwater bores surrounding the project area. However, only three bores are located near the project area and considered relevant, namely:

- GW024036 – an industrial bore located near the corner of Seventh Street and Keith Smith Avenue drilled to a depth of 6 metres but no water-bearing zones were recorded; and
- GW024655 and GW031808 – industrial bores located north of Ross Smith Avenue;
  - GW024655 was drilled to a depth of 9 metres and water bearing zones at 5.4 metres with a yield of 1.01 litre/second; and
  - GW031808 was drilled to a depth of 18 metres with water bearing zones at 5.6 metres, 9.1 metres and 11.8 metres. No yield information was available.

Historical land use

An examination of available air photos of the airport from the 1940s to the present enabled a compilation of the historical use of the project area. The potential for site contamination is directly related to the nature of historical land use.

Up to the 1940s, the project area was part of the private aerodrome and included some minor roads and facilities as well as cleared unused areas. From the 1950s to the 1970s, additional hangars and buildings were constructed along with new roads running both north-south and east-west including part of what is now Shiers Avenue and Keith Smith Avenue.

Between 1951 and 1965, the partial expansion and diversion of what is now Qantas Drive on the northern boundary of the project area had been undertaken. Between 1965 and 1970 the northern section of Ninth Street was constructed. By 1978, the remaining sections of the residential Lauriston Park estate along the eastern side of the project area were removed or demolished and by 1986 were completely replaced by larger commercial buildings and outdoor car parks areas associated with the expanding domestic terminals precinct.

During the 1990s, development on the project area intensified on both the airside and landside areas. A wash bay (Building 402) and a ground support equipment (GSE) maintenance building (Building 415) were developed in the northern part of the project area as well as the addition of two buildings in the western area – Fifth Street car park and domestic freight buildings. To the south-east of the project area, Sir Reginald Ansett Drive was restructured to curve to the south-west to provide more direct road access to the domestic terminals.

Since 2000, development on and adjacent to the eastern section of the project area has continued with the conversion of an outdoor car park in the south-west to form part of a multi-storey car park (Building 592 now known as P3) and the development of the Mercedes-Benz showroom to the east of the site.

The western section of the project area between Keith Smith Avenue and Shiers Avenue comprises three buildings of 428 (P1), 509 (P2) and 592 (P3) that accommodate

60 Department of Environment and Heritage, viewed online at http://www.nratlas.nsw.gov.au

61 www.waterinfo.nsw.gov.au

vehicle parking. The interiors and perimeters of these buildings show little evidence of contamination, however, given the age of their construction, or earlier components of their construction, it is possible some hazardous buildings materials may be present. The road network within and surrounding the multi-storey car parks showed little sign of significant contamination on its running surface though the asphalt is slightly worn with some patches of mild to moderate staining.

8.2.2 Impacts – construction and operation

Construction

Identification of the primary sources of contamination of the project area is based on the current and previous site uses, site observations and results of previous investigations. Overall, the potential for widespread soil and groundwater contamination to be encountered as part of the proposed works is considered to be low to moderate, although there is a possibility of encountering pockets of serious contamination, especially from asbestos as this was a common building material used until the 1980s.

Primary sources of contamination and key areas of risk on the project area are considered to be:

Leakage and spillage of fuels and oils

Leakage and spillage of fuels and oils are a potential source of hydrocarbon contamination particularly across the airside area of the project area (which is currently adjacent to the Jet Base) including maintenance areas, workshops, hangars, wash factories/cleaning facilities and airport apron areas.

No records or site observations specifically indicated the presence of underground storage tanks (USTs) for diesel or fuel within the project area. A liquid petroleum gas (LPG) UST is suspected in the Unigas taxi area and a UST for collection of liquid and aggregate waste was noted within Building 499 during a site inspection.

Given the various hangars, maintenance sheds, wash facilities, rental car wash and refuelling areas in the project area, it is possible that USTs associated with jet fuel, unleaded or leaded fuel, waste oil storage and separation, and solvents may also exist or have previously existed in the project area.

Imported filling

Imported filling present in the project area as a result of past and present site activities and migration of contaminants from neighbouring sites presents potential for a range of contaminants including but not limited to heavy metals, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), benzene, toluene, ethylbenzene and xylenes (BTEX), pesticides, phenols and asbestos. As a result, contamination from imported filling is considered to present a risk across the project area.

The primary sources of contamination are considered to be imported filling including building rubble fill (with potentially asbestos-containing building materials) and sands dredged from Botany Bay. Previous investigations undertaken within or adjacent to the project area generally indicate sandy, silty or gravelly fill to a maximum depth of 4 metres with elevated concentrations of heavy metals (particularly zinc), TPH and PAH[62].

In 2001, an airport-wide investigation similarly detected heavy metals (copper, lead, nickel, zinc) and petroleum hydrocarbons in the groundwater as well as arsenic and PAHs (especially benzo(a)pyrene) in the soil profile. Slag and ash has also been observed in filling to the north-west of the project area[63]. Building materials such as brick and metals were observed in the filling encountered at the wash bay (Building 561) and adjacent storage area for cars[64].

Potential filling from sands dredged from Botany Bay as well as other unknown fill are also indicators of ASS or potential acid sulphate soils (PASS). Potential ASS has been identified in various areas of the project area by previous investigations[65].

Hazardous building materials

Given the pre-1970s age of several of the buildings proposed for demolition (see Section 9.3) as well as their potential past industrial uses, there is high potential for hazardous building materials including asbestos, lead-based paints, and capacitors in light fittings containing polychlorinated biphenyls (PCB). Buildings and structures of concern noted from the review of the project area's history and site inspections are:

- Ninth Street substation adjacent to the rental car maintenance area (Building 325);
- Hangar 85, Store and Workshop (Building 84), Hangar 58 and the wash facility (Building 402);
- a meter box adjacent to Building 402 on Ninth Street;
- Seventh Street substation/transformer adjacent to the intersection of Seventh Street; and
- Shiers Avenue.

Demolition of the Ninth Street substation and the Seventh Street substation/transformer is required for the proposed development. As a result, PCB-impacted soils may be encountered. PCB contamination may pose a risk to human health and the wider environment if mishandled, especially to those undertaking intrusive works in the area such as piling or excavation.

62 Douglas Partners 2014
63 Douglas Partners 2014
64 Douglas Partners 2014
65 Douglas Partners 2014

The airside area west of the corner of Ninth Street and Qantas Drive is considered to present a potentially moderate to high risk in relation to soil and groundwater contamination from current and suspected previous site practices and uses.

In the multi-storey car park areas in the west of the project area, it is likely that filling will be encountered based on observations in previous studies[66]. The presence of filling is often an indicator of contamination consistent with the rest of the project area.

The potential contaminants of concern across the project area, based on the available data, are likely to include heavy metals, TPH, PAH, PCB, ASS and asbestos with a lesser likelihood of BTEX, organo-chlorine and organo-phosphate pesticides (OCPs/OPPs), volatile organic compounds (VOCs) and phenols.

Some of the services installed across the project area would have been installed many decades ago so there is potential for soil and groundwater contamination from leaking sewers, even though none has been encountered in previous investigations.

Operation

As a result of the increase in the extent of hard surfaces in the project area and the relatively low environmental risk associated with roadways and buildings to be used for the Ground Transport Interchange and hotel, the potential for soil contamination once the development is completed is considered to be low.

As noted in Section 4.2, an above ground refuelling facility containing both diesel and petrol in separate tanks is proposed to be located within the ground level of the Ground Transport Interchange. Given that this facility would be located in a bunded area of concrete or similar flooring with finished levels that would result in any spills or leaks being retained within the bunded area, it is anticipated that the potential for soil contamination from any leakage from this facility would be low.

8.2.3 Mitigation measures – construction and operation

Pre-construction

Prior to the start of construction, given the potential for contamination of soil and groundwater across the project area, further site investigations will be undertaken to ascertain the contamination status of the site in greater detail. These investigations will include:

- a detailed site investigation (DSI) to be undertaken across the areas proposed for excavation to confirm site suitability for the proposed land use (covering both soil and groundwater to the expected depth of excavation). In addition, the results of the DSI will inform the excavation and construction works and ensure there are no human health or environmental risks from the material encountered as well as assist with waste classification of material for off-site disposal (if required). The DSI will be undertaken for the whole project area with particular focus on the key areas of risk and primary sources of contamination including the substations, relevant areas adjacent to the Jet Base and rental car maintenance area;
- testing will be undertaken on all areas to be excavated as part of the proposed works to confirm the potential or otherwise for ASS;
- documentation relating to USTs that were or are present on-site (if any) and previous recorded spills or contaminating events will be made available to facilitate the DSI investigations involving detailed and/or targeted sampling across the project area;
- a destructive hazardous building materials survey will be undertaken on all buildings proposed for demolition in particular Hangar 85, Store and Workshop (Building 84), Hangar 58 (and associated ground handling equipment service office), wash facility (Building 402) and Ninth Street substation (Building 325). Inspection will also be undertaken of a suspected asbestos-containing meter box adjacent to Building 402 along Ninth Street;
- sampling will be undertaken from all easily accessible groundwater bores to update any currently available groundwater quality data. Groundwater migration is a very good indicator of likely soil contamination; and
- an 'unexpected finds' protocol will be implemented during any investigation works because of the potential for encountering filling such as building rubble that may comprise asbestos-containing materials.

Management of any identified contamination will occur in consultation with the Airport Environment Officer.

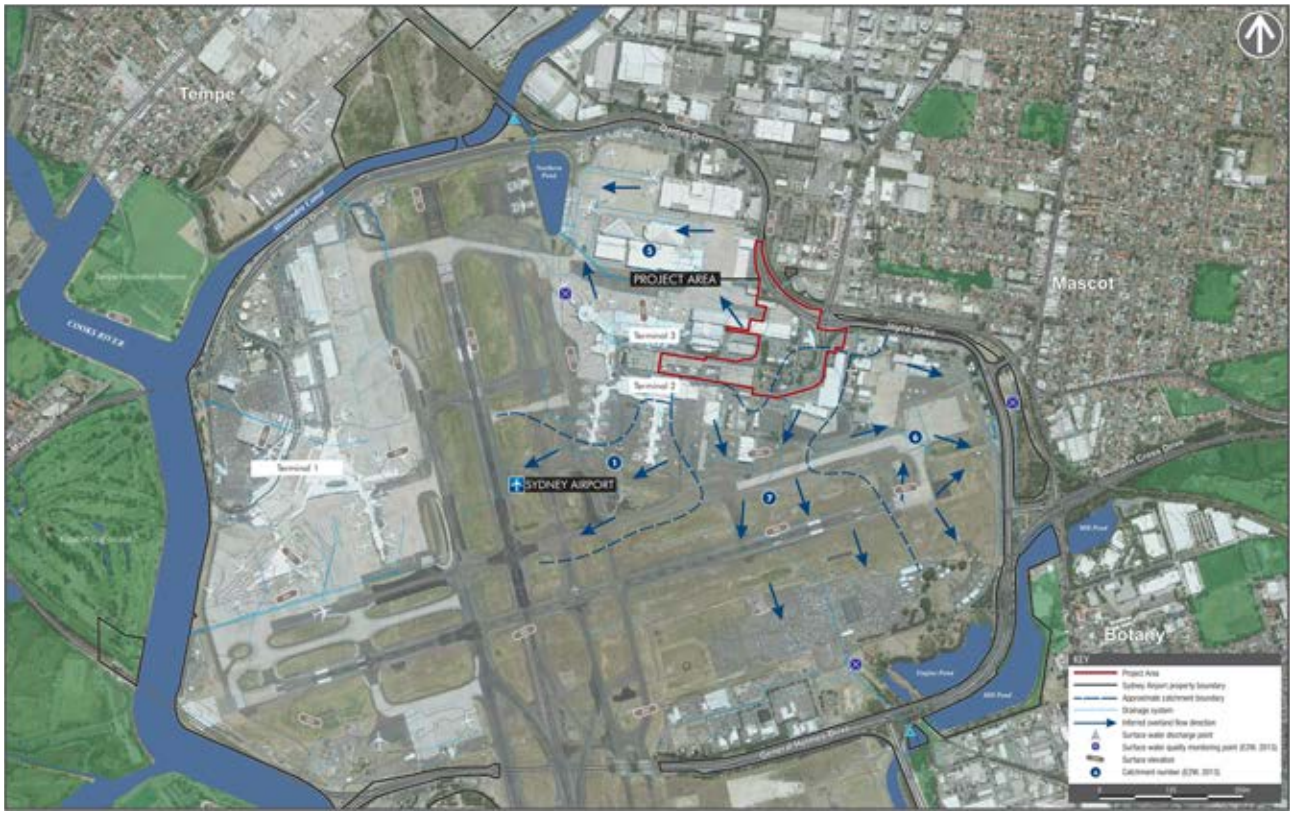
Construction

If any ASS is encountered during construction (especially any piling works), it will be managed in accordance with the relevant measures set out in the Acid Sulfate Soil Manual[67] including preparation of an ASS management plan. Contingency plans for managing any ASS and dewatering will be included in the project construction environmental management plan (CEMP). If any ASS is identified in the spoil generated, the material will be appropriately disposed of off-site or an area – either within the project area or elsewhere on the airport – will be set aside for the storage and/or treatment.

66 Douglas Partners 1983

67 NSW Acid Sulfate Soil Management Advisory Committee 1998

Figure 8.1 Receiving environments for stormwater collected within the project area



Source AECOM 2014b

As piling to a depth of at least 20 metres and site excavation to a depth of approximately 1 metre below ground surface will be required, an 'unexpected finds' protocol for any contaminants or hazardous materials will be developed.

Operation

Appropriate provisions will be included in operational management plans for both the refuelling facility and the Ground Transport Interchange overall to ensure there will not be any contamination as a result of their operation.

8.3 Surface water quality and hydrology

A specialist investigation was undertaken to assess surface water quality impacts of the proposed development and to nominate relevant mitigation measures for any identified adverse impacts. This investigation is reported in Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development Plan – Surface Water Impact Assessment[68]. Key findings of this investigation are presented below.

8.3.1 Existing conditions

Catchment characteristics

The project area lies within catchments 5 and 7 of Sydney Airport as defined in the draft Sydney Airport Surface Water Quality Plan[69] (see **Figure 8.1**). The extent of catchments 5 and 7 relative to the wider Sydney Airport site is also shown in **Figure 8.1**. The project area, including areas draining to the project area, comprises approximately 95 per cent impervious surfaces including:

- roads managed by RMS (Joyce Drive, O'Riordan Street and Robey Street) providing northern access to and from the T2/T3 precinct;
- roads managed by Sydney Airport (Qantas Drive, Shiers Avenue, Seventh Street, Ninth Street, Ross Smith Avenue, Sir Reginald Ansett Drive, Fourth Street and Keith Smith Avenue) within the T2/T3 precinct;
- building roofs; and
- hard-stand areas including T3 aircraft aprons, multi-storey car parking facilities, taxi holding bays, pedestrian footpaths, and various traffic furniture such as concrete medians.

68 AECOM 2014b

69 E2W, 2013

Figure 8.2 Main project area surface features and subsurface drainage network layout

Source AECOM 2014b

Pervious surfaces within the project area consist primarily of landscaping corridors providing visual amenity. Landscaping includes grassed and vegetated medians, trees and grassed corridors running parallel to the shoulders of access roads, arterial roads, buildings and car parks and mature vegetation providing visual screening[70].

Stormwater network characteristics

The project area's stormwater network comprises various typical drainage infrastructure including surface drains and a subsurface pit and pipe network. The majority of stormwater within the project area is collected as overland flow and collected either by kerb and gutter, grated drains or drainage inlet pits. **Figure 8.2** shows the main surface features and subsurface drainage network of the project area.

Stormwater is discharged either northwards to Alexandra Canal via the Northern Pond or southwards towards Mill Stream. Details of the stormwater network include:

- Alexandra Canal – stormwater captured within the northern portion of the project area consisting of approximately 95 per cent impervious area is conveyed north-west and is ultimately discharged from the Northern Pond into a ponding area north of Airport Drive. Stormwater is then discharged into Alexandra Canal to the north-west of the project area. It then flows to Cooks River and drains south to Botany Bay.
- Mill Stream – stormwater captured from the southern portion of the project area, the smaller of the two catchments again consisting of approximately 95 per cent impervious area, is conveyed south/south-east and is ultimately discharged downstream of the Mill Pond weir. The discharge point is located within the environmentally sensitive Sydney Airport Wetlands (Engine Pond East). Stormwater water is ultimately discharged into Botany Bay via Mill Stream.

Figure 8.1 shows a plan view of the receiving environments for stormwater collected within the project area.

Flooding

Relevant flood studies in the vicinity of Sydney Airport are:

- Alexandra Canal Catchment Flood Study (Draft)[71]
- Cooks River Flood Study[72]
- Sydney Airport Services Master Plan[73]

Based on the Cooks River Flood Study completed in 2009, it is evident that stormwater leaving the project area via the Northern Pond discharges to flood prone land to the north

70 AECOM 2014d
71 Cardno, 2010
72 MWH + PB, 2009
73 AECOM, 2012

during the 1 in 100 year ARI event. However, no flooding impacts for the project area were identified in the above assessments.

Surface water quality

Sydney Airport water quality targets

The *Airports (Environment Protection) Regulations 1997* is the primary source for allowable criteria of pollutants/contaminants of concern (CoCs) for freshwater collected from Sydney Airport. This includes the project area. However, in the absence of criteria for certain CoCs such as polycyclic aromatic hydrocarbons or phenolic compounds, the Australia and New Zealand Guidelines for Fresh and Marine Water Quality[74] provide additional guidance. The Sydney Airport Environment Strategy 2013–2018 provides the overarching goals and objectives of surface water quality management for Sydney Airport, primarily minimisation of the impact of airport operations on water quality in water bodies on or adjacent to the airport.

Selected criteria for CoCs that correlate with water quality targets for the downstream receiving environment of Botany Bay are specified in **Table 8.1**. A detailed listing of adopted criteria for each CoC is provided in Table 1 of Water Quality Plan for Sydney Airport (Draft)[75].

Botany Bay water quality targets

The Sydney Metropolitan Catchment Management Authority (SMCMA) developed the Botany Bay and Catchment Water Quality Improvement Plan[76]. The objective of the water quality improvement plan (WQIP) is to improve the quality of water discharged into Botany Bay as a result of activities carried out in the wider Botany Bay catchment.

Sydney Airport falls within the sub-catchment draining directly into Botany Bay, with Sydney Airport forming approximately 1 per cent of the catchment area[77].

The WQIP sets targets for pollutant load reductions relating to gross pollutants, total nitrogen, total phosphorus, and sediments (turbidity). Target pollutant load reductions for water discharged into Botany Bay provided in the WQIP are shown in **Table 8.2**.

With reference to **Table 8.2**, the project area falls within the major redevelopment category. Therefore the applicable water quality targets specified for this category apply to the operation of the project. This requires a reduction of each of the pollutants identified in **Table 8.2** relative to that generated within the catchment (for example, if a catchment generates 10mg/L total suspended solids, an 85 per cent reduction would equate to an average discharge concentration of 1.5mg/L total suspended solids for a major redevelopment).

Existing surface water quality management

Stormwater run-off within the northern portion of the project area is currently managed by directing stormwater captured within kerb and gutter or dish drains discharging to the drainage network that reaches the Northern Pond before release to Alexandra Canal. A floating containment boom prevents floating gross pollutants from entering the Alexandra Canal. Gate valves have also been installed at the discharge location for the Northern Pond to Alexandra Canal to manage stormwater discharges from Sydney Airport during wet weather events. As a result, stormwater quality is improved through the detention of stormwater within the Northern Pond before controlled discharges to Alexandra Canal.

No stormwater quality infrastructure has been identified for stormwater captured within the southern portion of the project area draining to Mill Stream in the south/south-east.

Table 8.1 Selected criteria for contaminants of concern relevant to downstream receiving environments

	Fresh Water Criteria		Marine Water Criteria	
Pollutant	**A(EP) Regs 1997**	**ANZECC (95%)**	**A(EP) Regs 1997**	**ANZECC (95%)**
Gross pollutants	–	–	–	–
Suspended solids (SS) (mg/L)	+/- 10%1	6	–	0.5
Total phosphorus (TP) (mg/L)	0.005	0.01	–	0.03
Total nitrogen				
(TN) (mg/L)	0.01	0.35	–	0.3

Note 1: Seasonal mean variation of total suspended solids in receiving environment

Source: ANZECC, 2000, and Australian Government, 1997

74 ANZECC, 2000

75 E2W, 2013

76 SMCMA, 2011

77 SMCMA, 2011

Table 8.2 Pollutant reduction targets for water discharged into Botany Bay

Pollutant	Greenfield developments and major redevelopments	Multi-unit, commercial, industrial and small developments
Gross pollutants	90%	90%
Total suspended solids (TSS)	85%	80%
Total phosphorus (TP)	60%	55%
Total nitrogen (TN)	45%	40%

Source SMCMA, 2011

Existing surface water quality monitoring

Surface water quality monitoring is conducted at Sydney Airport in accordance with the *Airports (Environment Protection) Regulation 1997* and to comply with the Sydney Airport Environment Strategy 2013–2018[78].

The latest rounds of sampling were conducted at seven locations across Sydney Airport in May/June and December 2012 and May 2013. Surface water quality monitoring is completed as part of the wider Sydney Airport environmental monitoring program, with the following parameters analysed:

- diffuse source pollutants:
  - suspended solids
  - total nitrogen as N
  - total phosphorus as P
- point source pollutants:
  - heavy metals
  - pesticides
  - phenols
  - polycyclic aromatic hydrocarbons (PAH)
  - total petroleum hydrocarbons (TPH)
  - benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN)
  - hydrocarbons
  - anionic surfactants as methylene blue active substances (MBAS)
- faecal coliforms

The stormwater network upstream of existing surface water quality monitoring sites drains both airside and landside catchments. As such, water quality monitoring results specific to the project area are not available. Because of these limitations, and with consideration of the water quality risks to receiving environments, the Botany Bay water quality targets will be adopted where practicable for the project. Currently, based on results reported for other parts of the landside portion of Sydney Airport with similar catchment characteristics, there is the potential for the following contaminants to be generated within the project area:

- gross pollutants such as rubbish from hard-stand areas, including access roads and car parks;
- nutrients collected from landscaping areas and the ambient environment during rainfall events;
- heavy metals, TPH, PAH, oil and grease collected from hard-standing, car parks and access roads as a result of spills and residues; and
- detergents from the rental car facility's wash bay (Building 561) located on Shiers Avenue.

The airside portion of the project area (see **Figure 8.1**) consists predominantly of aircraft apron used for facilitating aircraft taxiing and temporary storage as well as buildings used for aircraft maintenance, known as the Southern Hangar Line. Contaminants generated within the airside portion of the project area are expected to be similar to landside contaminants as a result of aircraft movements and maintenance activities.

8.3.2 Impact assessment

Construction

The demolition and construction phases of the project have the potential to impact on the quality of surface water collected in the project area and adversely impact receiving environments. This could result from:

- erosion of unconsolidated soils exposed during demolition and earthworks, including spoil handling and stockpiling, to be completed in stages as detailed in Section 4.9;
- dewatering works for deep excavations; and
- localised spills from construction machinery and equipment.

The potential impacts of the above activities during construction are discussed below.

78 Sydney Airport 2014b

Erosion and sedimentation

The following works in **Table 8.3** involving excavation would have the greatest potential to result in erosion and sediment transportation:

The generation of exposed soil surfaces and dust would mainly occur during earthworks, stockpiling and materials handling. If surface run-off comes into contact with these exposed soil surfaces during wet weather events, fine-grained materials and sediments may be discharged to the stormwater network eventually reaching Mill Stream or the Northern Pond (which ultimately discharges into Alexandra Canal). Both watercourses discharge downstream into Botany Bay.

The majority of excavations for pavements and underground services across the project area would generally be to a depth of approximately 1 metre below ground surface. However, construction of building foundations, which would include piling works or other deep excavation works, would be carried out to much greater depths to facilitate construction of the Ground Transport Interchange. Excavation would also occur beneath Shiers Avenue to construct the taxi underpass. Spoil materials would be generated during excavation within these areas, with greatest spoil volumes likely to be generated in the Ground Transport Interchange construction footprints.

With the exception of the Ground Transport Interchange and P1 East construction areas, other construction works as detailed in Section 4.9 are predominantly localised with limited ability to expose large soil surface areas. The risk of erosion in these areas is considered to be low with localised impacts mitigated through conventional surface water quality control measures.

Sedimentation of the Northern Pond may reduce its storage capacity. Localised impacts may also be apparent in other construction areas where small quantities of stockpiled materials are stored temporarily adjacent to, or within, drainage lines draining to the project area discharge points.

Dewatering of excavations

During deep excavations for the Ground Transport Interchange, dewatering may be required to remove groundwater related to the construction of piers and foundations. Water bearing zones were reported to be at 5.6, 9.1 and 11.8 metres below ground surface to the north of Ross Smith Avenue adjacent to the project area[79]. As a result, there is the potential for groundwater of varying qualities to be encountered during subsurface excavation works[80]. This could result in groundwater of poor quality being pumped to the surface. If this groundwater is not managed appropriately, it may cause localised surface contamination if discharged to surrounding surfaces, or degradation of receiving environments downstream if discharged to the existing stormwater drainage network. Refer to Douglas Partners 2014 for details regarding contaminated groundwater.

Localised spills and wastes

As with all construction works utilising plant and equipment during construction works, there is the potential for the release of harmful chemicals during construction. This could impact on surface water quality in the project area if not managed appropriately. Typical chemicals and substances stored or utilised within the project area would include fuels, oils, lubricants, hydraulic fluids and other chemicals related to the operation of machinery and equipment. Release of these substances could occur from accidental spillage, refuelling operations, failure of plant and equipment, conducting maintenance operations or the inappropriate storage, handling and use of substances. These substances have the potential to be mobilised in surface run-off during rain events or to be directly discharged into the stormwater network.

Table 8.3 Excavation works by project

Project	Description of works
Project 1	demolition works causing excessive settled dust on ground surfaces
Project 1	excavation for the Seventh Street extension, road pavement augmentation/reconfiguration/ realignment of Qantas Drive, Joyce Drive, Sir Reginald Ansett Drive and other associated hard-stands and access roads including the Shiers Avenue taxi underpass
Project 3	demolition of P1 East excavation required for the construction of building and car park foundations
Project 5	road works and the construction of new roads
Projects 1, 2, 3, 4, 5, 6 and 7	stockpiling and handling of spoil materials associated with the above activities
Projects 1, 3, 4, 5 and 6	stockpiling and handling of spoil materials associated with the above activities

79 Douglas Partners, 2014

80 Douglas Partners, 2014

Operation

Operational impacts to surface water quality relate primarily to contaminants collected from surfaces within the project area reaching the stormwater drainage network. Potential operational impacts include:

- contamination of surface run-off collected from external impervious surfaces (for example in catchments of the Seventh Street extension, pavement additions to Qantas Drive, Joyce Drive and Sir Reginald Ansett Drive); and
- direct discharge of contaminants to the stormwater network (for example from internal surfaces of the Ground Transport Interchange and expanded car park structures where vehicle movements will occur conveying oils, greases and fuels to the stormwater network).

The potential impacts of the above activities during operation of the proposed development are identified below.

Contamination of surface water run-off

Pavements across the project area would be either augmented or constructed to facilitate light vehicle and bus movements, provide access and car parking within the Ground Transport Interchange, P1 East, P3 car park areas and the service road on the northern side of P2. Potential pollutants generated within the project area include exhaust by-products, fuels, lubricants, heavy metals from corrosion of vehicle parts, rubbers, gross pollutants and sediments. During wet weather events these contaminants would be collected by surface run-off and conveyed to the drainage network, discharging either into the Northern Pond or into Mill Stream.

For the northern portion of the project area some contaminants (such as gross pollutants, larger sediments and pollutants attached to larger sediments) would be removed before discharging into Alexandra Canal. This would be achieved through continued use of existing floating booms and detention of surface run-off prior to discharge. Dissolved contaminants and nutrients would continue to be discharged to Alexandra Canal and Mill Stream. Contaminants would impact on receiving watercourses, including Botany Bay, and marine flora and fauna.

Discharge of contaminants direct to the stormwater drainage network

The quick turnaround (QTA) rental car facility is proposed to be on the ground floor of the Ground Transport Interchange. This facility would allow refuelling of rental cars and would contain above-ground storage tanks containing diesel and petrol. During refuelling or deliveries of diesel and petrol, there is the potential for spills and overflows of hazardous liquids to enter the subsurface drainage network directly and discharge to Alexandra Canal via the Northern Pond.

Loss of containment of wastewater from car washing

A quick turnaround facility for rental cars to be located in the Ground Transport Interchange will include facilities for vehicle cleaning and washing. Any loss of containment of waste water from vehicle washing may potentially harm water quality if the wastewater were to reach receiving waters.

8.3.3 Mitigation

Construction

Mitigation and management measures to be implemented during demolition and construction to achieve surface water quality improvements are set out below.

Administrative controls

Administrative controls to ensure construction works minimise impacts to the environment would be detailed in a site-specific construction environmental management plan (CEMP) developed for the project. The CEMP would be prepared by the managing construction contractor and would include a soil and water management plan (SWMP). Work method statements would be prepared for construction activities carried out across each phase of construction works, including surface water quality management measures.

Erosion and sediment control

Temporary works would be carried out to manage disturbed areas during demolition and construction. Temporary works would be installed and regularly inspected consistent with the CEMP and the Blue Book[81]. Temporary works would include:

- installation of temporary sedimentation traps, sandbags, silt fences or other appropriate devices to capture sediment from disturbed areas during earthworks until disturbed areas are re-established. This would be particularly important around temporary material stockpiles in dedicated construction laydown areas if close to drainage lines and for materials particularly susceptible to erosion;
- removal of temporary soil and water management structures only after areas have been stabilised; and
- regular visual inspections of stockpiles temporary and permanent drainage lines, and construction areas to assess the effectiveness of mitigation and management measures.

81 Landcom, 2004

Impermeable surfaces where stormwater run-off would come into contact with excessive amounts of settled dust would be managed through a dust management plan detailed in the CEMP. Measures to reduce the potential for sedimentation of drainage lines and downstream receiving environments include:

- where possible, minimisation of tracking equipment and plant across hard-stand surfaces following earthworks, particularly during wet weather events. This is to reduce the potential to track earthen materials into drainage lines or overland flow areas;
- provision of a vehicle wash-down and sediment-removal facility;
- provision of dust suppression measures such as water sprays and coverage of exposed surfaces with permeable sheeting on roads and within earthworks areas to prevent the migration and settlement of dust;
- minimisation of exposed surfaces at any one time to minimise dust generation within the project area; and
- use of dedicated construction laydown areas for each stage of the project.

Further details regarding mitigation and management of dust generation during construction are presented in Section 8.5.

Groundwater management during dewatering

Groundwater extracted for dewatering purposes during deep excavation works would be managed in accordance with a groundwater management plan contained within the CEMP. Testing would characterise water quality, with appropriate discharge options determined based on sampling results. If extracted groundwater is determined to exceed relevant criteria, it would be either removed and disposed of to an appropriately licensed facility, or treated and discharged from the project area. Criteria for any discharges of any groundwater brought to the surface and discharged to the drainage network would be included in the CEMP. Extracted groundwater would not be discharged from the project area without prior approval to ensure groundwater discharges meet relevant water quality discharge criteria.

Operation and maintenance of plant and equipment

Plant and machinery would be operated in a responsible manner by suitably qualified operators to ensure that spills of construction materials are minimised. All plant and machinery would be regularly maintained to ensure good working order to minimise the risk of fuel and oil leaks. In the unlikely event of a spill or leak, the use of spill kits and emergency containment would reduce the impacts on surface water quality. Details of the operation and maintenance of plant and equipment would be detailed in the CEMP.

Operation

In order to meet the water quality targets described in Section 8.3.1, the following management measures would be considered subject to the identified physical constraints.

Surface water run-off quality

Management of surface water run-off quality is critical within the project area due to the high proportion of impervious surface areas (approximately 95 per cent). These surfaces would continue to have a high potential to generate pollutants due to their impermeable nature, which can then be conveyed to the stormwater drainage network during wet weather events. There are a number of options, or a combination of these options, to mitigate surface water quality impacts on downstream receiving environments for surface water captured within the project area. These options include:

- pollution control at the source to reduce the volume of surface run-off required to be treated before discharge; and
- treatment of surface water run-off including detention of surface run-off for non-potable reuse.

Examples of these options are presented in the following sections and are subject to consideration during detailed design phase.

Green roofs

Green roofs provide reduction in areas that generate pollutants and can decrease the need for downstream treatment devices to treat surface run-off, depending on catchment characteristics. As there is limited ground space in the project area and the requirement for a high proportion of impervious areas to facilitate ground movements, the potential for a green roof located on part of the hotel roof may provide benefits such as:

- reduced impervious surface generating pollutants reaching the Northern Pond and ultimately Botany Bay via Alexandra Canal;
- provision of stormwater detention, subject to the footprint size of the green roof, reducing peak flows into the Northern Pond; and
- addition to the amenity of the roof space of the hotel.

This option would be subject to the consideration and acceptance of the future hotel operator to construct and maintain a green roof or roof-top garden. Flooding impacts within the Northern Pond could also be limited through the detention of stormwater within the green roof. However, this would require further investigation.

Passive filtration management measures

The use of granular filter drains or passive filtration techniques utilising trees and/or vegetation has been used extensively to provide pretreatment of stormwater upstream of conventional subsurface treatment devices. These systems could be used along the Seventh Street extension carriageway and portions of Sir Reginald Ansett Drive as grading of the existing pavement allows. Passive filtration techniques assist in the reduction of contaminant entry to the subsurface stormwater network.

Using the Seventh Street extension as an example of a passive watering system, stormwater would be conveyed via overland flow across the road surface to kerb and gutter as is typically done within conventional stormwater drainage systems. At allotted distances along the kerb line, perforations would allow stormwater to penetrate the kerb during low flow conditions, with a conventional inlet pit installed downstream to cater for high flow conditions. Stormwater then infiltrates the subsurface through a permeable filter media removing contaminants such as gross pollutants, sediments, and pollutants attached to sediments. Filtered water then reaches subsurface drainage piping and is discharged into the conventional subsurface drainage network. Modular designs of the vegetated filtration system are also available that may be applied in areas of confined space, both above and below ground, noting underground services are proposed along both sides of the Seventh Street extension. These systems can also add to the visual amenity of the Seventh Street extension and, where possible, along Sir Reginald Ansett Drive.

Subsurface treatment devices

A number of proprietary treatment devices are available to treat stormwater flows in the subsurface network before discharge. These devices assist in removing contaminants such as gross pollutants, sediments, hydrocarbons and nutrients (nitrogen and phosphorus). Treatment devices are typically separated into primary and secondary treatment categories, with primary treatment relating to the removal of larger contaminants such as gross pollutants (for example rubbish), coarse sediments and some nutrients.

Stormwater reuse

Opportunities exist for the capture and storage of surface run-off collected from impervious surfaces within the project area for reuse on-site. Collected water could be used for non-potable water demands such as rental car washing within the QTA facility, watering of landscaping and for non-potable requirements within the commercial facility and Ground Transport Interchange (for example, toilet flushing). Storage also provides the added benefit of reducing the peak discharge into the Northern Pond during wet weather events, an area reported as susceptible to flooding (see Section 8.3.1). Available catchment and storage volumes would be determined during detailed design to cater for identified demands, including any treatment required before reuse depending on the nature of proposed uses.

Management of spills and direct discharge of contaminants to the stormwater network

Management of any spills and direct discharges of contaminants within the QTA refuelling and vehicle washing facilities to the stormwater network would be managed by the installation of:

- bunding around the refuelling and fuel storage area to cater for emergency spills and prevent the migration of diesel to the subsurface drainage network;
- sump(s) within bunded areas with sufficient capacity to capture any spills or overflows of fuel before discharge to the drainage network;
- appropriate design of vehicle washing area(s) and controls to contain waste and wastewater; and
- the implementation of environmental management plans.

Surface water quality compliance monitoring

Continued water quality monitoring of surface water discharged from the project area, as well as the wider Sydney Airport site, would be carried out in accordance with the Draft Water Quality Plan[82].

8.4 Ground noise

A specialist investigation was undertaken to identify and assess the noise and vibration impacts of the proposed development and to nominate relevant mitigation measures for any identified impacts. This investigation is reported in T2/T3 Ground Access Solutions and Hotel Sydney Airport – Acoustic Assessment[83]. Key findings of this investigation are presented below.

Sydney Airport is on Commonwealth land and, as a result, noise emission requirements are based on Commonwealth legislation – *Airports Act 1996* and *Airports (Environment Protection) Regulations 1997 – Schedule 4 – Excessive Noise – Guidelines*. These guidelines do not provide indicators for excessive noise but instead provide general considerations for noise emission and control. The NSW Environment Protection Authority's (EPA) Interim Construction Noise Guideline (ICNG) and Industrial Noise Policy (INP) are considered to provide appropriate mechanisms for the assessment of potential noise impacts and have been adopted for this assessment.

82 E2W, 2013

83 SLR Consulting Pty Ltd, 2014

8.4.1 Existing conditions

Noise monitoring

Environmental noise monitoring:

- characterises the existing noise environment in the vicinity of the airport; and
- establishes the noise levels on which to base the operational noise emission objectives.

The noise monitoring locations selected correspond to residential areas around the airport and are applicable to the T2/T3 Ground Access Solutions and Hotel project area. Noise loggers were located at the following four residences:

- 105 Baxter Road, Mascot;
- 25 Baxter Road, Mascot.
- 57 McBurney Avenue, Mascot; and
- 27 Bay Street, Botany.

These monitoring locations are shown in **Figure 8.3**. The locations selected are shielded from traffic on major roads so that the long-term background noise levels are representative of the nearest residential receivers to the project area. **Figure 8.3** also shows residential and commercial assessment locations. The noise data were processed in accordance with the procedures documented in the Industrial Noise Policy[84] (INP). Note the four locations above are both assessment and ambient noise monitoring locations while 32 Ewan Street (shown in **Figure 8.3**) is an assessment location only.

Table 8.4 presents rating background level (RBL) or background (LA90) and LAeq ambient noise levels for the noise monitoring locations adjacent to the project area.

8.4.2 Impact assessment

Construction noise and vibration

Assessment criteria

Based on ambient noise levels at representative locations (see **Table 8.4**), noise management levels (NMLs) for construction noise have been set in accordance with the Interim Construction Noise Guideline[85] (ICNG).

Site-specific NMLs at residences based on the RBL noise levels presented in **Table 8.4** are presented in **Table 8.5**. Specific non-residential receivers in the vicinity of the project area and their recommended NMLs are presented in **Table 8.6**.

In relation to sleep disturbance, guidance from the NSW Road Noise Policy[86] (RNP) concludes that:

- maximum internal noise levels below 50-55 dBA are unlikely to cause awakening reactions; and
- one or two noise events per night with maximum internal noise levels of 65-70 dBA are not likely to significantly affect health and wellbeing.

Guidance in relation to acceptable vibration levels from construction activities for human comfort are provided in Assessing Vibration: A Technical Guideline[87]. This guideline provides three assessment methods, depending on whether the vibration is continuous, impulsive or intermittent.

Noise modelling

In order to determine the acoustic impact of the construction of the proposed T2/T3 ground access solutions and hotel, a three dimensional noise model was implemented using SoundPLAN v7.1 software, incorporating the significant noise sources and the intervening terrain and buildings to the residences. The noise model applies the CONCAWE noise prediction algorithm and is a suitable approach to predict the noise emissions from the operation of various components that comprise the elements of the proposed development.

As indicated in Section 4.9, there is likely to be some overlap in the construction periods for the seven projects/stages which comprise the proposed development. Based on the proposed phasing and identification of relevant sound power levels corresponding to equipment likely to be used, modelling scenarios (see **Table 8.7** were developed that are representative of typical 'worst case' construction impacts during both daytime and evening/night-time periods. These scenarios are:

Impacts

Construction noise impacts on residential receivers

The major potential sources of construction noise include excavators with hammers, excavators, concrete saws, angle grinders and concreting activities. Construction noise from the worst case from each of the construction phases was predicted at each of the five residential receiver areas (see **Figure 8.3**).

The resultant noise levels predicted for each of the scenarios outlined above are presented in **Table 8.8** for daytime (or standard construction hours), evening and night-time periods. The predicted noise levels correspond to the most impacted receiver within the noise monitoring location area.

The daytime results indicate:

- compliance with the NMLs is predicted for all scenarios at the eastern and north eastern receivers (25 Baxter Road, Mascot; 57 McBurney Avenue, Mascot, 105 Baxter Road, and 27 Bay Street, Botany); and

84 NSW EPA, 2000
85 NSW EPA, 2009
86 2011
87 DEC, 2006

Figure 8.3 Noise monitoring locations

Source SLR consulting Australia Pty Ltd 2014, p12 (on Google Earth base)

- at the northern receiver (32 Ewan Street), there are predicted exceedances of the NMLs of up to 4 dB during scenario 5. The exceedances are a result of the proximity of the works undertaken on Qantas Drive (Project 6 roadworks) to the receivers. As the exceedances are less than 5 dB, they are considered to be relatively minor.

The evening/night-time results indicate:

- compliance with the NMLs is predicted for scenarios 3 and 4 at all the eastern receivers (25 Baxter Road, Mascot; 57 McBurney Avenue, Mascot and 27 Bay Street, Botany);
- at the northern and north-eastern receivers (32 Ewan Street and 101 to 133 Baxter Road), the evening NMLs

Table 8.4 Summary of existing background and ambient noise levels (dBA)

	LA90 (15minute) Rating background level			LAeq (period) Existing ambient noise level		
Residential location	**Day 07.00–18.00**	**Evening 18.00–22.00**	**Night 22.00–07.00**	**Day 07.00–18.00**	**Evening 18.00–22.00**	**Night 22.00–07.00**
105 Baxter Road, Mascot	54	54	46	65	65	61
25 Baxter Road, Mascot	52	52	41	62	63	57
57 McBurney Avenue, Mascot	53	52	45	64	67	59
27 Bay Street, Botany	52	51	46	61	61	55

Source SLR Consulting Australia Pty Ltd 2014, p13

Table 8.5 Project-specific NMLs for residential assessment – construction

Monitoring location	NML LAeq (15 minute) assessment criteria (dBA) 1		
	Day	Evening	Night
32 Ewan Street, Mascot	64	59	51
105 Baxter Road, Mascot	64	59	51
25 Baxter Road, Mascot	62	57	46
57 McBurney Avenue, Mascot	63	57	50
27 Bay Street, Botany	62	56	51

Notes

Source SLR Consulting Australia Pty Ltd 2014, p15

1. The NML as based on the ambient noise levels at 105 Baxter Street are applicable to other receivers in that area including 32 Ewan Street, Mascot.
2. In accordance with the ICNG, daytime NMLs are based on the RBL + 10dB and evening and night-time NMLs based on the RBL + 5dB.

Table 8.6 NMLs at commercial and industrial premises – construction

Land use	LAeq (15minute) construction NML
Stamford Plaza Hotel, Robey Street, Mascot	Internal noise level 35 dBA1
Commercial and offices, including McDonalds, Ross Smith Avenue	External noise level 70 dBA
Industrial premises, including Hangar 20	External noise level 75 dBA
Scenario 4	Projects 4, 5 and 6 daytime

Note: Based on recommended internal noise levels from AS2107:2000

Source SLR Consulting Australia Pty Ltd 2014, p15

for Scenarios 3 and 4 are predicted to be exceeded by up to 9 dB at Ewan Street and up to 6 dB at Baxter Road; and

- at the northern and north-eastern receivers (32 Ewan Street and 101 to 133 Baxter Road), the night-time NMLs for Scenarios 3 and 4 are predicted to be exceeded by up to 17 dB at Ewan Street and up to 12 dB at Baxter Road.

The three projects undertaken during this scenario are roadworks related, with exceedances a result of the relative close proximity of the receivers to the construction works. As it is likely that the noise would be audible to the nearest residential receivers, the impact would be considered low to moderate, consequently mitigation measures will be implemented.

Predicted night-time exceedances are mostly a result of roadworks (Project 5 Roadworks and Project 6 Roadworks) undertaken on Joyce Drive and Qantas Drive in relative close proximity to the receivers. Residential receivers are potentially located as close as 65 to 100 metres from the proposed works. However, given the length of these roadworks - approximately 550 metres, for most of the construction works, lower noise levels are likely to be experienced at the sensitive receivers.

Sleep disturbance

The LAeq predicted noise levels are for a typically noisy 15 minutes of equipment operation in each stage and represent a summation of noise levels. LAmax noise levels are predicted to be up to 6 dB higher than the maximum LAeq (15 min) during Scenario 3. Sleep disturbance is

Table 8.7 Construction period modeling scenarios

Project	Description of works
Scenario 1	Enabling works Project 1, including hangar demolition and pavement removal – daytime;
Scenario 2	Projects 1 and 2 – daytime;
Scenario 3	Projects 3 and 5 daytime, evening and night-time;
Scenario 4	Projects 4 and 6 – evening and night-time; and
Scenario 5	Projects 4, 6 and 7 daytime

Source SLR Consulting Australia Pty Ltd 2014, p21

Table 8.8 Scenario 1 – Predicted construction noise levels – residences

Construction stage	Residential receiver	Project specific NML	Predicted LAeq (15min) noise level	Complies
DAYTIME				
Scenario 1 Project 1A enabling works	32 Ewan Street, Mascot	64	59	Y
	105 Baxter Road, Mascot	64	57	Y
	25 Baxter Road, Mascot	62	45	Y
	57 McBurney Avenue, Mascot	63	46	Y
	27 Bay Street, Botany	62	38	Y
Scenario 2 Project 1B Project 2	32 Ewan Street, Mascot	64	64	Y
	105 Baxter Road, Mascot	64	68	N
	25 Baxter Road, Mascot	62	46	Y
	57 McBurney Avenue, Mascot	63	47	Y
	27 Bay Street, Botany	62	37	Y
Scenario 3 Project 3A Project 5 road works	32 Ewan Street, Mascot	64	55	Y
	105 Baxter Road, Mascot	64	63	Y
	25 Baxter Road, Mascot	62	46	Y
	57 McBurney Avenue, Mascot	63	44	Y
	27 Bay Street, Botany	62	39	Y
Scenario 5 Project 4 Project 6 road works Project 7	32 Ewan Street, Mascot	64	68	N
	105 Baxter Road, Mascot	64	63	Y
	25 Baxter Road, Mascot	62	47	Y
	57 McBurney Avenue, Mascot	63	48	Y
	27 Bay Street, Botany	62	43	Y
EVENING/NIGHT-TIME				
Scenario 3 Project 3A Project 5 road works	32 Ewan Street, Mascot	59/51	55	N
	105 Baxter Road, Mascot	59/51	63	N
	25 Baxter Road, Mascot	57/46	46	Y
	57 McBurney Avenue, Mascot	57/50	47	Y
	27 Bay Street, Botany	56/51	36	Y
Scenario 4 Project 4A Project 4B Project 6 road works	32 Ewan Street, Mascot	59/51	68	N
	105 Baxter Road, Mascot	59/51	58	N
	25 Baxter Road, Mascot	57/46	42	Y
	57 McBurney Avenue, Mascot	57/50	44	Y
	27 Bay Street, Botany	56/51	37	Y

Source SLR Consulting Australia Pty Ltd 2014, pp22-24

Table 8.9 Project 1 – Predicted construction noise levels – non-residential properties

Construction stage	Commercial receiver	Project-specific NML	Predicted noise level	Complies
Scenario 1 Project 1A enabling works/ demolition	Qantas Hangar	75	89	N
	Pump House – water storage	75	63	Y
	AAE Cargo Building	70	84	N
	Mercedes Benz Dealership	70	81	N
	Terminal T3 South	70	54	Y
	Terminal T3 East	70	54	Y
	Terminal T2	70	57	Y
	Flight kitchen	70	63	Y
	DHL Building	70	65	Y
	McDonalds Restaurant	70	58	Y
	FAC House admin office	70	66	Y
	Hangar 96 – office	70	76	N
	Stamford Plaza Hotel	35[1]	69 (34)	Y
	Ibis Budget Hotel	35[1]	60 (25)	Y
Scenario 2 Project 1B, Project 2	Qantas Hangar	75	85	N
	Pump House – water storage	75	69	Y
	AAE Cargo Building	70	82	N
	Mercedes Benz Dealership	70	62	Y
	Terminal T3 South	70	57	Y
	Terminal T3 East	70	52	Y
	Terminal T2	70	59	Y
	Flight kitchen	70	63	Y
	DHL Building	70	67	Y
	McDonald's Restaurant	70	48	Y
	FAC House admin office	70	69	Y
	Hangar 96 – office	70	74	N
	P1 Valet	70	57	Y
	P2 Valet	70	73	N
	Stamford Plaza Hotel	35[1]	64 (29)	Y
	Ibis Budget Hotel	35[1]	53 (18)	N
Scenario 3 Project 3A Project 5 roadworks	Qantas Hangar	75	64	Y
	Pump House – water storage	75	77	N
	AAE Cargo Building	70	78	N
	Mercedes Benz Dealership	70	70	N
	Terminal T3 South	70	81	N
	Terminal T3 East	70	67	Y
	Terminal T2	70	74	N
	Flight kitchen	70	84	N
	DHL Building	70	83	N
	McDonald's Restaurant	70	67	Y
	FAC House admin office	70	71	N
	Hangar 96 – office	70	72	N
	P1 Valet	70	77	N
	P2 Valet	70	82	N
	Stamford Plaza Hotel	35[1]	69 (39)	Y
	Ibis Budget Hotel	35[1]	76 (43)	N
Scenario 4	Hangar 20	75	74	Y

continued on following page

Table 8.9 Project 1 – Predicted construction noise levels – non-residential properties

continued

Construction stage	Commercial receiver	Project-specific NML	Predicted noise level	Complies
Scenario 4 Project 4A construction Project 4B road works Project 6 Road works	Hangar 20	75	74	Y
	Pump House – water storage	75	60	Y
	AAE Cargo Building	70	75	N
	Mercedes Benz Dealership	70	87	N
	Terminal T3 South	70	53	Y
	Terminal T3 East	70	53	Y
	Terminal T2	70	56	Y
	Flight kitchen	70	60	Y
	DHL Building	70	86	N
	McDonalds Restaurant	70	54	Y
	FAC House admin office	70	64	Y
	Hangar 96 – office	70	63	Y
	P1 Valet	70	56	Y
	P2 Valet	70	65	Y
	Stamford Plaza Hotel	35[1]	74 (39)	N
	Ibis Budget Hotel	35[1]	62 (27)	Y
Scenario 5 Project 4A construction of Ground Transport Interchange Project 4B Road works Project 6 Road works Project 7	Qantas Hangar	75	75	Y
	Pump House – water storage	75	60	Y
	AAE Cargo Building	70	75	N
	Mercedes Benz Dealership	70	87	N
	Terminal T3 South	70	55	Y
	Terminal T3 East	70	56	Y
	Terminal T2	70	60	Y
	Flight kitchen	70	63	Y
	DHL Building	70	70	Y
	McDonalds Restaurant	70	61	Y
	FAC House admin office	70	64	Y
	Hangar 96 – office	70	68	Y
	P1 Valet	70	56	Y
	P2 Valet	70	65	Y
	Stamford Plaza Hotel	35[1]	77(42)	N
	Ibis Budget Hotel	35[1]	67 (32)	Y

Notes

Source SLR Consulting Australia Pty Ltd 2014, pp25-26

1 The Stamford Plaza Hotel and Ibis Budget Hotel NML is an internal noise level

2 Hotel predicted internal noise levels are shown in brackets for comparison with the NML.
The predicted noise levels are based on 6.38 mm laminate glazing and a window area of 2m² per hotel suite

anticipated at the northern (32 Ewan Street) and north-eastern receivers (105 Baxter Road, Mascot) with exceedances predicted of up to 13 dB and up to 8 dB respectively for Scenario 3 and Scenario 4.

Construction vibration

Due to the significant distance from the construction works to the nearest residences, no adverse impacts are predicted to any residence due to vibration from the construction activities.

Construction noise impacts on commercial and non-residential receivers

The commercial receivers considered are expected to operate during the daytime period only, with the exception of the Stamford Plaza Hotel and Ibis Budget Hotel and the McDonald's cafe/restaurant (see **Figure 8.3**), which operate 24 hours a day, 7 days a week. For the hotels, an internal noise target of not greater than LAeq 35 dBA at all times has been assumed. This is in accordance

Table 8.10 Safe Working Distances for Vibratory Rollers[1]

Roller Class	Weight Range	Centrifugal Force Range	Distance from Building	
			A[2]	B[3]
I Very Light	Less than 1.25 tonnes	10–20 kN	3 m	No effect
II Light	1 to 2 tonnes	20–50 kN	5 m	No effect
III Medium	2 to 4 tonnes	50–100 kN	6 m	12 m
IV Medium Heavy	4 to 6 tonnes	100–200 kN	12 m	24 m
V Heavy	7 to 11 tonnes	200–300 kN	25 m	50 m
VI Very Heavy	12 tonnes and over	Over 300 kN	25 m	50 m

Source: SLR Consulting Australia Pty Ltd 2014, pp28–30

Note 1: Source of data: ARRB Special Report No.11, *Ground Vibrations: Damaging Effects to Buildings*"

Note 2: A – Values suggested to prevent damage to buildings.

Note 3: B – Values suggested to minimise strongly adverse comment from residents.

with the recommendations of AS2107:2000 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors. The predicted noise levels at these locations are presented in **Table 8.9**.

The results of this assessment are:

- due to the proximity to the construction works (typically 10 to 20 metres), the NMLs will be exceeded at most commercial receivers. The exceedances are typically less than 10dB. However, exceedances of up to 17 dB are predicted at the Mercedes-Benz showroom, up to 15 dB at the AAE freight building, up to 14 dB at the flight kitchen and Qantas Hangar, up to 12 dB at the DHL building, up to 11 dB at the Qantas Terminal T3 South and less than 7 dB at the remainder of the receivers. No exceedances are predicted at the McDonalds Restaurant and the Qantas Terminal T3 – South.
- at the hotel receivers which accommodate sleeping areas, exceedances of up to 6 dB and 7 dB are forecast at the Ibis Budget Hotel and at the Stamford Plaza Hotel respectively. These exceedances would generally occur as a result of roadworks adjacent to the two hotels.

Construction vibration impacts on commercial and non-residential receivers

The major potential sources of construction vibration include auger-driven piling, excavators and vibratory rollers.

Levels of ground vibration caused by vibratory rollers can be up to 1.5 mm/s at 25 metres. The highest levels of vibration usually occur as the roller is brought to rest and the frequency of the centrifugal forces passes through resonance with the natural frequency of the roller/ground structure.

Based on recommendations used by the NSW Roads and Maritime Services, Table 8.10 sets out safe working distances for the use of vibratory rollers adjacent to buildings.

As indicated on Table 8.10, the use of all classes of roller is allowable when operating greater than 50 metres from the closest on-site buildings to the T2/T3 project area.

Due to the distances between the proposed work areas and nearby structures, vibration produced by earthworks and pavement forming operations is expected to lie below structural damage criteria. Where vibration-intensive operations are being conducted in close proximity to the buildings nearest to the earthworks, judicious selection of plant and equipment would be necessary.

Vibration may be perceptible for occupants of the buildings for relatively short periods of time when construction activities are immediately adjacent to specific buildings.

Operational noise

Assessment criteria

The NSW Industrial Noise Policy (INP) was adopted to assess the operational impacts of the proposed development associated with changes to traffic noise generated by vehicle movements within the project area. While the NSW EPA has no role in regulating the activities occurring within the airport boundary, the INP criteria are considered to be a valid means of identifying potential acoustic impacts.

In accordance with the INP, amenity criteria have been set having regard to the prevailing land use (urban/industrial interface) and modified to account for existing levels of industrial noise around the airport. The resulting operational intrusive and amenity noise emission criteria are presented in **Table 8.11**.

Table 8.11 INP project-specific intrusive and amenity noise assessment criteria

Residential location	Intrusive LAeq(15minute) Assessment Criteria 1			Amenity LAeq(day/evening/night) Assessment Criteria 2		
	Day	Evening	Night	Day	Evening	Night
32 Ewan Street, Mascot	59	59	51	65	55	50
105 Baxter Road, Mascot	59	59	51	65	55	50
25 Baxter Road, Mascot	57	57	46	62	53	47
57 McBurney Avenue, Mascot	58	57	50	59	57	48
27 Bay Street, Botany	57	56	51	63	51	45

Notes:

Source SLR Consulting Australia Pty Ltd 2014, p22

1 The intrusive criterion is applicable over any 15 minute period

2 The amenity level is applicable over the whole daytime, evening or night-time period, as appropriate

Noise modelling

Noise from the traffic associated with the proposed development was calculated using the CoRTN algorithm[88] within the SoundPLAN V7.1 noise modelling software package. Traffic volumes for the 2012 (existing scenario) and 2018 (future scenario) were derived from the traffic assessment[89]. Hourly traffic volumes over the 24 hour day for the number of vehicles arriving and departing from the T2/T3 precinct were used to predict the daytime, evening and night-time noise levels at the residential areas to the north-west, north and east of the project area. **Table 8.12** presents a summary of the traffic volumes used in the modelling.

Impacts on residential receivers

Noise levels predicted at the residential receivers resulting from traffic on the internal road network associated with the proposed development, are presented in **Table 8.13**. Year 2012 represents the current 'do nothing' scenario and Year 2018 the future with operation of all elements of the proposed T2/T3 ground access solutions and hotel.

The results presented in **Table 8.13** show compliance with the INP assessment criteria with either a 1 dB to 2 dB decrease, no change, or an increase of typically 1 dB to less than 2 dB associated with the T2/T3 upgrade compared to the 'do nothing' scenario. Small variations in noise levels are due to a combination of increase in overall traffic volumes from 2012 to 2018, different distribution of the traffic volumes on the project roads with the addition of Seventh Street in 2018 and locations of the receivers in respect of the project roads.

8.4.3 Mitigation measures – construction and operation

Construction period

During detailed design of the proposed development and as part of the overall CEMP, a construction noise and vibration management plan would be prepared and include best practice mitigation measures such as:

- use of localised acoustic hoarding around all significantly noise generating items of plant. This would be expected to provide between 5 dB and 10 dB of additional noise

Table 8.12 Traffic volumes used in operational modelling

Location	Year 2012 (no. of vehicles)			Year 2018 (no. of vehicles)		
	Day	Evening	Night	Day	Evening	Night
Sir Reginald Ansett Drive	36,115	10,638	7,918	22,555	7,104	4,981
Ninth Street	3,748	1,082	748	1,069	468	192
Seventh Street extension	n/a	n/a	n/a	20,841	7,587	4,331

Note: The volumes shown are inclusive of light and heavy vehicles

Source SLR Consulting Australia Pty Ltd 2014, p28

88 Calculation of Road Traffic Noise, UK, 1988

89 AECOM 2014a

Table 8.13 Predicted traffic noise levels – residential receivers

Residential locations	LAeq (period) assessment criteria 1			LAeq (day/evening/night) predicted noise levels Year 2012/Year2018		
	Day	Evening	Night	Day	Evening	Night
32 Ewan Street, Mascot	59	59	51	47/46	46/46	41/40
105 Baxter Road, Mascot	59	59	51	52/50	51/50	46/44
25 Baxter Road, Mascot	57	57	46	34/35	32/35	29/29
57 McBurney Avenue, Mascot	58	57	50	37/37	36/37	31/31
27 Bay Street, Botany	57	56	51	32/33	31/33	26/27

Notes: Source SLR Consulting Australia Pty Ltd 2014, p28

1 The LAeq criteria presented is the lower of the INP intrusive and amenity criteria

2 The predicted amenity level is applicable over the whole daytime, evening or night-time period, as appropriate

attenuation, if adequately constructed, to ensure line-of-sight between all receivers and the construction equipment is broken;

- selection of plant and equipment to minimise noise emission where possible while maintaining efficiency of function. Residential grade silencers will be fitted and all noise control equipment will be maintained in good order;
- installation of silencers to truck parking (compressed air release) brake;
- restriction on the use of tonal reversing alarm to daytime only. Tonal reversing alarms can be replaced with squawker types and OH&S procedures implemented during the night-time, such that alarms are not required during this period;
- where possible, reschedule night-time roadworks located close to the northern residential receivers to occur during the evening period only;
- consideration of using temporary noise barriers where feasible and reasonable;
- no dropping of materials from height/throwing metal and metal to metal contact to be minimised; and
- a program to liaise with and inform potentially affected residents (see Section 3.5).

In terms of the potential for impact on the commercial buildings operated within the airport precinct, a review of the construction plan would be required to confirm whether pre-construction building condition surveys would be warranted.

The construction methodology, plant and equipment, management of vibration impacts, and the consultation protocol would be reviewed before commencing construction. This should be addressed as part of the construction noise and vibration management plan for the proposed development.

Operational noise

As no noise impacts are forecast, no specific mitigation measures are proposed.

Through implementation of its environment strategy, Sydney Airport will continue to manage and minimise ground based noise emissions from airport operations generally.

8.5 Air quality

A specialist investigation was undertaken to identify and assess the air quality impacts of the proposed development and to nominate relevant mitigation for any identified adverse impacts. This investigation is reported in Sydney Airport T2/T3 Ground Access Solutions and Hotel – Air Quality Assessment Major Development Plan[90]. The key findings of this assessment are presented below.

8.5.1 Existing conditions

Meteorology

On an annual basis, the predominant winds at the airport are from the south and north-west. Southerly and north-easterly winds dominate in summer and north-westerly winds are prominent in the other seasons. The prevailing winds vary across the seasons, with summer experiencing strong southerly and north-easterly wind influences. In winter, the winds are almost wholly contained within the north-western quadrant. There is a broadly consistent seasonal pattern across all years.

90 Pacific Environment Limited, 2014

The annual average temperature at Sydney Airport between 2008 and 2012 was 18°C. On average, January and February were the hottest months, with an average of 23°C and a maximum of 41°C. June was the coldest month for the five year period, with average minimum temperature of 3°C.

The annual average relative humidity reading collected at 9am at the Sydney Airport site was 65 per cent. The month with the highest relative humidity on average was June, with a 9am average of 71 per cent. The months with the lowest relative humidity were August and September.

Air quality in the vicinity of the airport

In order to understand whether the T2/T3 ground access solutions and hotel would be likely to have a significant impact on local air quality, the existing levels of air pollution on and in the vicinity of the airport were established.

The NSW EPA currently has 14 active monitoring sites in NSW but none are in the immediate vicinity of the airport. The closest active EPA monitoring sites to the airport are at Earlwood (approximately 3km north-west of the airport) and Randwick (approximately 4.5km east of the airport) (see **Figure 8.4**). The RMS also conducts monitoring at several sites near the M5 East tunnel with the following sites considered in this assessment: Site T1 (Thompson Street, Turrella), Site U1 (Jackson Place, Undercliffe), Site X1 (Wavell Parade, Earlwood), Site CBMS (Gipps Street, Bardwell Valley).

Air quality monitoring was undertaken within the airport boundary at several sites from 1994 to 2005.

The absence of air pollution measurements for Sydney Airport since 2005 means that the current air quality environment can only be inferred for the air quality assessment as follows:

Figure 8.4 Location of air pollution monitoring stations near the airport

Source Pacific Environmental Limited 2014, p19

- air quality at the EPA and RMS monitoring sites in Sydney has generally improved between 2000 and 2012;
- between 2000 and 2005 air quality at Sydney Airport was broadly comparable to that at the EPA and RMS monitoring sites; and
- given the above, it is likely that air quality at the airport has also probably improved between 2000 and 2012, although this cannot be stated definitively given the increase in airport traffic during this period. Nevertheless, annual mean pollutant concentrations at the airport are likely to be well below the corresponding standards.

The air pollution data also suggest that there are likely to be few, if any, exceedances of the annual mean and short-term limits for NO_2, CO and SO_2. However, there will probably continue to be exceedances of the 24-hour limit for PM_{10} (primarily due to natural events).

8.5.2 Impact assessment

Construction

The construction impacts were assessed using a semi-quantitative risk based approach. The main air pollution and amenity issues at construction sites are:

- annoyance due to dust deposition (soiling of surfaces) and visible dust plumes;
- elevated PM10 concentrations due to dust-generating activities; and
- exhaust emissions from diesel-powered construction equipment.

Dust emissions can occur during both site preparation (demolition and earth moving) and construction itself. Such emissions can vary substantially from day to day depending on the level of activity, the specific operations being undertaken, and the weather conditions. A significant portion of the emissions results from site plant and road vehicles moving over temporary roads and open ground. If mud is allowed to get onto local public roads, dust emissions can occur at some distance from the construction site[91].

The assessment considered the following dust impacts:

- annoyance due to dust soiling; and
- the risk of health effects due to an increase in exposure to PM10.

For simplicity, all the construction projects were examined in combination and a general focal point for the construction activity was assumed to be the junction of Qantas Drive and Sir Reginald Ansett Drive. As shown on **Figure 8.5**, there are multiple off-site[92] receptors within 350 metres of the boundary of the project area.

The assessed risks in terms of dust soiling and PM_{10} for demolition activity were assessed to be either negligible risk or low risk. Earthworks and construction activity was assessed to be either low risk or medium risk. All tracked-out soil was found to be medium risk.

Operation

Approach to assessment

The following scenarios were used in the assessment of air quality impacts:

- 2012 – considered to be a base case year against which future scenarios could be compared;
- 2018 do nothing (DN) – traffic growth from forecasts based on projected growth in airport passenger numbers from the approved Master Plan 2033. This scenario also includes forecast growth of non-airport related traffic that uses the adjacent road network. This scenario retains the same infrastructure as the 2012 baseline; and
- 2018 do something (DS) – traffic growth from forecasts based on projected growth in airport passenger numbers from the approved Master Plan 2033. This scenario also includes forecast growth of non-airport related traffic that uses the adjacent road network. This scenario adopts the proposed T2/T3 Ground Access Solutions and Hotel.

In order to understand the operational impacts of the airport on local air quality, the existing background concentrations of pollutants in the local area were established. A base case emissions inventory for 2012 was compiled within EDMS using activity data provided by Sydney Airport for specific emission sources and modelled traffic data[93]. Growth projections from Sydney Airport were applied to determine emissions for 2018 in combination with projected traffic volumes with (2018 DS) and without (2018 DN) the T2/T3 Ground Access Solutions and Hotel.

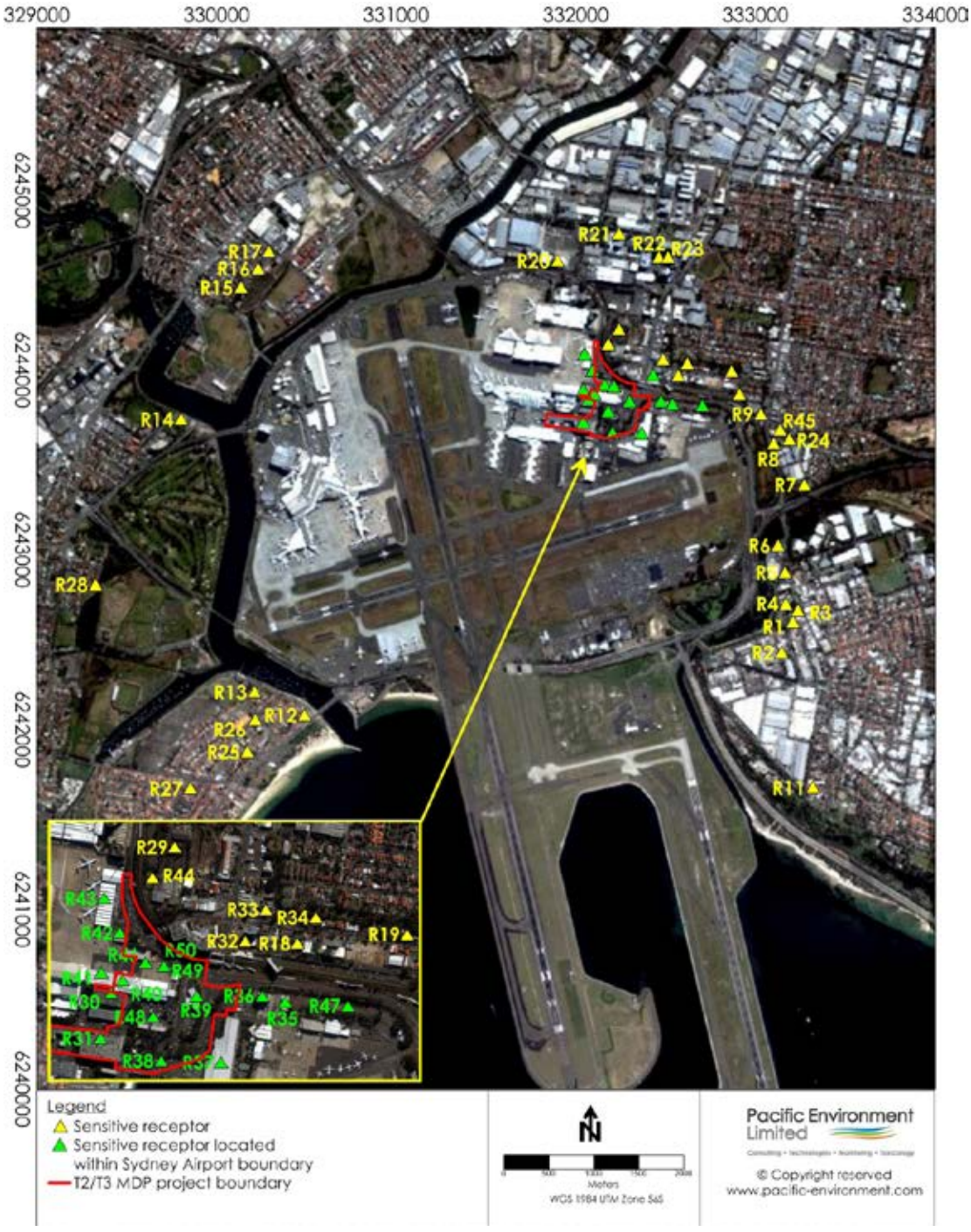
For dispersion modelling, spatial information on aircraft movements and on other emission sources such as engine testing and auxiliary power units (APUs), the airport layout and meteorological data were used to determine the airport's contribution to pollutant concentrations at discrete

91 IAQM, 2014

92 There are several on-site sensitive receptors that include a hotel with a bar on the rooftop, commercial facilities and office buildings. However, it has been assumed that exposure/amenity for most on-site receptors would be managed by the airport and therefore the construction assessment focused mainly on off-site receptors with a few exceptions

93 AECOM 2014a

Figure 8.5 Location of sensitive receptors



Source Pacific Environmental Limited 2014, p31

receptors. The results from the dispersion model were then combined with the background concentrations to determine the likely impacts of the operations at the airport including the T2/T3 Ground Access Solutions and Hotel on air quality.

Emission inventories

Aircraft movements were by far the largest source of VOCs, NO_X and SO_X in all three scenarios investigated, with the contribution of aircraft to overall emissions found to be increasing with time. Aircraft engine tests were also an important source of NO_X and SO_X. Aircraft were the largest single source of PM_{10} and $PM_{2.5}$ but emissions from APUs,

ground support equipment (GSE), roadways and training fires were important. In the case of CO, the largest single source in 2012 was GSE, although the contribution of GSE decreased substantially by 2018. Emissions of other pollutants from GSE also decreased during this period as a result of the assumption within EDMS that older vehicles would be replaced by newer ones with lower unit emissions.

There were only small differences in total emissions of each pollutant (less than 1 per cent) between the 2018 'do nothing' and 2018 'do something' scenarios, i.e. as a result of the T2/T3 Ground Access Solutions and Hotel.

Results of dispersion modelling

For all pollutants, there was an increase in concentrations near the proposed Ground Transport Interchange and a decrease in concentrations near the existing car parking facilities. In all cases, the changes were small. Overall, the effect of the T2/T3 ground access solutions and hotel on local air quality will not be measurable.

The highest pollutant concentrations were generally observed for the receptors to the east and north-east of the airport. This was probably due to the prevalence of southerly winds and the proximity of these receptors to the activities at T2 and T3.

For most pollutants and averaging periods, no exceedances of the air quality criteria in any of the three scenarios were predicted. The likely reasons for this result include the receptors being located some distance from the most significant emission sources and a substantial proportion of aircraft emissions occurring at altitude. The result that maximum predicted 24-hour PM_{10} concentrations were well below the criterion of 50 µg/m^3 at most receptors supports the earlier statement in 2008 by Holmes Air Sciences that the measured exceedances of the short-term PM_{10} criterion were attributable to bushfires and dust storms. A similar explanation for $PM_{2.5}$ is also adopted.

While no exceedances of the PM_{10} criteria were predicted, there were exceedances of the 24-hour $PM_{2.5}$ NEMP advisory goal.

The main concern was the one-hour criterion for NO_2 (246 µg/m^3), for which exceedances were predicted at 21 receptors in 2012 and 16 receptors for both the 2018 'do nothing' and 2018 'do something' scenarios. As a result, the 1-hour NO_2 predictions from EDMS were considered in more detail. The results were dominated by small numbers of one-hour periods with high predicted NO_X concentrations and the same 1-hour periods were responsible for the exceedances at several receptors. These results appear to contradict the findings from the air pollution monitoring at Sydney Airport (see Section 8.5.1) and suggest that further work should be done to validate the airport-wide model using local measurements.

In contrast with total emissions at the airport, for which aircraft movements were the largest source of NO_X, operations at gates (APUs, GSE and aircraft engines at idle) were the largest contributors (more than 75 per cent) to the NO_X concentrations at receptors during the periods of exceedance for the most impacted receptor (receptor 29). This difference is probably due to a large proportion of aircraft emissions being released well outside the airport boundary that is up to a height of 915 metres and away from receptors.

8.5.3 Mitigation and management measures – construction and operation

Construction

During the construction phase, the best practice measures routinely employed at construction sites would be incorporated in a dust management plan as part of the CEMP and used to minimise nuisance due to dust. Particular attention would be paid to controlling dust generated by track-out.

Operation

Given the likely negligible impact of the proposed T2/T3 ground access solutions and hotel on air emissions in the T2/T3 precinct, no specific mitigation measures are recommended for the operational phase. Through implementation of its environment strategy, Sydney Airport will work towards minimising exceedances and managing emissions, including through the encouragement of airlines and ground handlers moving to alternatively fuelled ground support equipment such as electric tugs.

8.6 Hazard and risk

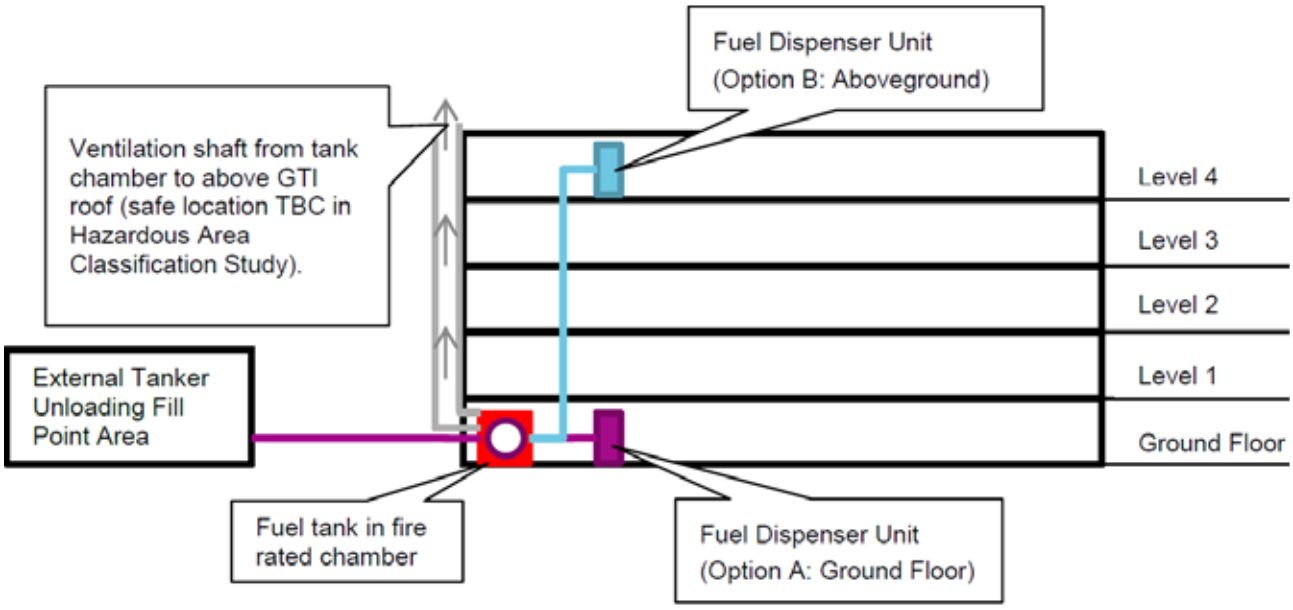
A specialist investigation was undertaken to identify and assess the potential hazards and risks associated with the proposed QTA refuelling facility to be ltocated at the ground floor level in the proposed Ground Transport Interchange. This investigation is reported in Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development Plan – Hazard and Risk Assessment[94]. The key findings of this assessment are presented below.

8.6.1 Potential project hazards and risks

As noted in Section 4.2.4, a quick turnaround (QTA) refuelling facility is proposed at ground floor level within the Ground Transport Interchange. This facility is proposed with two fuel storage tank volume options:

94 AECOM 2014c

Figure 8.6 Ground Transport Interchange - QTA refuelling facility arrangement



- a new smaller fuel tank with 5.4kL storage capacity (Option 1); and
- retain the original tank storage capacity of 10.8kL (Option 2).

The refuelling facility requires the storage of both diesel and petrol. As such, a dual compartment tank is recommended to minimise the area occupied by the tank.

Current arrangements for the fuel tank serving the existing refuelling facility adjacent to Ninth Street with the existing rental car QTA facility requires the tank to be replenished once daily by a fuel tanker delivery service. Depending on the tank quantity selected for the proposed development, Option 1 (5.4kL) would require delivery and refilling twice daily and Option 2 (10.8kL) would require delivery and refilling once daily.

The proposed above-ground tank arrangement consists of the fuel storage tank located on the ground level of the Ground Transport Interchange supplying fuel to the fuel dispensers located nearby also on the ground floor level (see **Figure 8.6**). The fuel tank will sit in a fire rated tank chamber in accordance with AS 1940-2004 – The Storage and Handling of Flammable and Combustible Liquids.

8.6.2 Impacts – construction and operation

Approach to assessment

Potential hazards and risks associated with the proposed QTA refuelling facility in the context of storage and handling of dangerous goods were considered consistent with the risk management approach advocated in AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines[95].The risk analysis process applied a tiered assessment approach consistent with Assessment Guideline: Multi-Level Risk Assessment[96]. A qualitative screening and analysis was applied to nine credible hazard scenarios to identify any elevated qualitative residual risk after the application of available risk control and mitigation measures.

Table 8.14 QTA refuelling facility – dangerous goods class and quantities

Fuel	Class/packing group (PG) [AS 1940-2004]	Class/packing group (PG) [AS 1940-2004]	Quantity
Petrol	3 PGII	< 23 °C (medium danger)	Option 1: 5.4 kL and Option 2: 10.8 kL
Diesel1	C1 Combustible liquid	< 150 °C	

Notes

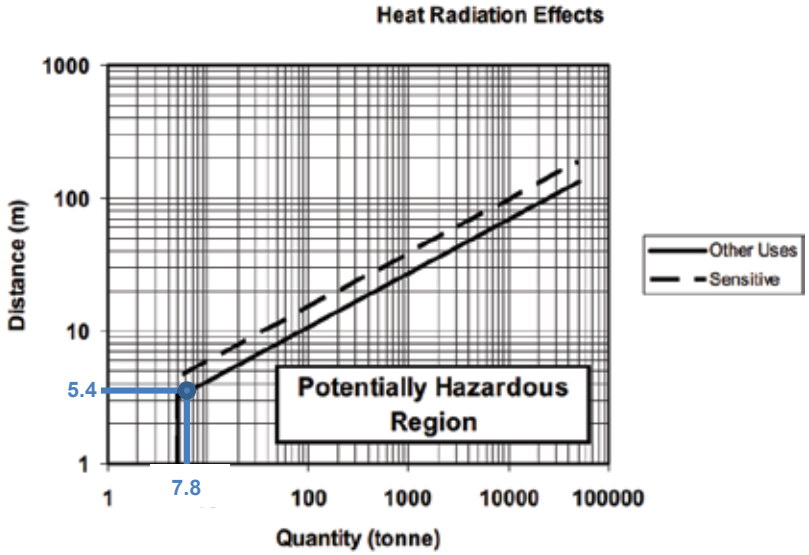
Source: AS 1940-

1. Diesel is technically Class 3 C1. However, for the purposes of this assessment, it was assigned Class 3 PGII as the fuel will be stored in the same general area as the petrol fuel as per SEPP 33 guidelines

95 Standards Australia & Standards New Zealand, 2009

96 Department of Planning, 2011

Figure 8.7 Heat radiation distance thresholds to site boundary



Source: Hazardous and Offensive Development Application Guidelines Applying SEPP 33, Appendix 4 Figure 9, NSW Dept of Planning, 2011

Table 8.15 Transport screening thresholds

	Vehicle Movements		Minimum quantity* per load (tonne)	
	Cumulative	Peak		
Class	Annual *or*	Weekly	Bulk	Packages
1	see note	see note	see note	
2.1	>500	>30	2	5
2.3	>100	>6	1	2
3PGI	>500	>30	1	1
3PGII	>750	>45	3	10
3PGIII	>1000	>60	10	no limit
4.1	>200	>12	1	2
4.2	>100	>3	2	5
4.3	>200	>12	5	10
5	>500	>30	2	5
6.1	all	all	1	3
6.2	see note	see note	see note	
7	see note	see note	see note	
8	>500	>30	2	5
9	>1000	>60	no limit	

Source: Hazardous and Offensive Development Application Guidelines Applying SEPP 33, NSW Dept of Planning, 2011

While NSW legislation does not apply to Commonwealth land and thus the airport, where Commonwealth legislation is silent, NSW legislation may be used. State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)[97] presents a systematic approach for consent authorities to planning and assessing proposals for potentially hazardous and offensive developments. The policy assesses whether proposals can proceed based on several factors including suitability of location, development and operational safety and pollution control.

An initial risk screening process outlined in the SEPP 33 guidelines documentation is utilised to determine whether the nature of the development is potentially hazardous. The risk screening is a quantitative assessment based on threshold limits for storage and transport. The outcomes of the risk screening will determine if a preliminary hazard assessment is required for the next stage.

Dangerous goods class and quantities

The proposed QTA refuelling facility will comprise a petrol and diesel tank located on the ground floor of the Ground Transport Interchange car park. **Table 8.14** presents the class and quantities of the dangerous goods to be stored in the proposed tank.

Heat radiation separation distance thresholds

The thermal radiation effects of a fire event can critically and directly impact on adjacent and nearby occupants and objects. Heat radiation effects are the key basis on which Class 3 PGII flammable liquids are screened in SEPP 33. **Figure 8.7** quantitatively illustrates the heat radiation effects and the minimum separation distances required relative to the fire source point and the quantity of flammable liquids in order to identify and classify potentially hazardous regions.

The proposed fuel volume of Option 1 (5.4kL or approximately 3.9 tonnes) is relatively low and does not trigger the heat radiation separation distance threshold

97 NSW Department of Planning, 2011

limits in the initial stage of the SEPP 33 risk screening. Option 2, which has a storage tank capacity of 10.8kL (approximately 7.8 tonnes) requires a minimum separation distance of 5.4 metres from the site boundary. As the separation distance between the tank to the site boundary is relatively large (approximately 40 metres), the fuel storage tanks are not identified as potentially hazardous in this regard.

Transport screening thresholds

On the basis that either 5.4kL or 10.8kL of fuel will be delivered either twice or once daily, seven days a week, the proposed delivery arrangement will not trigger the transport vehicle movement limits of 750 annually or 45 weekly (see **Table 8.15**).

Results of the initial risk screening

The outcome of the risk screening process confirmed that a preliminary hazard analysis is not required as the fuel types, quantities, location from the site boundary and delivery requirements do not trigger the SEPP 33 threshold limits.

However, it is noted that the proposed hotel and its associated occupants and activities is located relatively close to the external Ground Transport Interchange and, as a result, may be exposed to potential risks from the proposed QTA refuelling facility. Specific hazards include exposure to heat radiation and smoke as a result of potential fires associated with the QTA refuelling facility.

As such, the level of risk associated with these scenarios would be quantified to understand what control measures need to be introduced to ensure a level of risk so far as is reasonably practicable (SFARP). This assessment will address (as a minimum) the following issues:

- potential heat radiation effects (i.e. heat radiation consequence distances);
- smoke generation and migration, and required extraction systems; and
- Hazardous area classification (assessment of potential flammable/explosive atmosphere generation due to flammable vapours being produced during refuelling activities).

Hazard identification

Material properties

The QTA fuel tanks will store a combination of petrol fuel and diesel fuel in a 5.4kL or 10.8kL dual compartment storage tank. In ambient conditions, diesel fuel is non-volatile. It has a high flashpoint and auto-ignition temperature. Therefore the likelihood of diesel fuel self-igniting is low. On the other hand, petrol fuel has a slightly higher auto-ignition temperature limit but a significantly lower flash point threshold and is hence flammable under ambient conditions.

Although diesel is classified as a C1 combustible fuel, it will be stored in a duel compartment tank with the petrol fuel. In accordance with AS1940 Clause 5.7.7, in such circumstances the properties of the lower flashpoint substance shall apply to the total volume of the tank (i.e. both compartments will be treated as containing Class 3 PGII flammable liquids).

Credible threat scenarios

A qualitative risk assessment was applied to credible hazard scenarios to identify any residual risk after the application of available risk control/mitigation measures. A range of potential hazard scenarios associated with the storage and handling of the petrol and diesel fuels on-site were considered in conjunction with the potential causes, consequences and control measures. The threat scenarios considered related to:

- tanker unloading (fill point);
- tank storage;
- fuel transfer from tank to dispenser;
- fuel dispenser units; and
- decommissioning of the existing refuelling facility.

The outcomes of the qualitative risk analysis confirmed that all hazard scenarios considered do not exceed the minor risk rating, indicating that more detailed risk analysis is not required to be conducted.

The outcomes of the qualitative risk analysis also highlight the significance of implementing controls and mitigation measures, and identify the areas requiring further assessment to ensure levels of risks are minimised as SFARP:

- potential heat radiation effects (i.e. heat radiation consequence distances);
- smoke generation and migration, and required extraction systems; and
- hazardous area classification (assessment of potential flammable/explosive atmosphere generation due to flammable vapours being produced during refuelling activities).

Based on the risk evaluation and recommended measures to achieve acceptable consequence outcomes, the QTA refuelling facility could be designed and constructed in a manner that is protective of human health and safety on-site and off-site, and protective of the surrounding environment.

Figure 8.8 Location of vegetation within the project area

Source AECOM 2014d p

8.6.3 Mitigation measures – construction and operation

Preparation and implementation of a comprehensive safety management system would be undertaken as a necessary and effective means of managing hazards and risks posed by the project through construction, operation and eventual decommissioning.

8.7 Ecology

A specialist investigation was undertaken to assess the potential ecological impacts of the proposed development and to nominate relevant mitigation for any identified adverse impacts. This investigation is reported in Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development Plan: Ecological Impact Assessment[98]. The key findings of this assessment are summarised below.

8.7.1 Existing flora and fauna of the project area

Ecological context of Sydney Airport

The airport lies within the Sydney Basin bioregion of NSW. This bioregion lies on the central east coast of NSW, encompasses some 3,624,000ha and is considered one of the most biologically diverse bioregions in Australia. This is due in part to the variation in geology, topography and climate throughout the Sydney Basin.

The natural environment of the airport - and hence the biodiversity value that the site is capable of supporting - has been dramatically altered during its 102 year aviation history. Very few areas of native vegetation remain on or adjacent to the site and no threatened flora species have been recorded within the site[99]. The lack of remnant vegetation is a limiting factor on the presence of threatened fauna species. However, the small number of vegetated parcels and open grassed areas provide habitat for common fauna species, particularly birds.

Flora

Vegetation communities

The field assessment of the project area revealed a highly modified landscape with no vegetation communities present (see **Figure 8.8**). The vegetation observed was restricted to small areas of landscaping, distributed across the project area. Such landscaping was typically comprised of exotic and/or non-indigenous native trees, and is often

98 AECOM 2014d

99 Biosis, 2001

Table 8.16 Flora species recorded in the project area

Scientific name	Common name	Status	
		EPBC Act	TSC Act
*Arctotheca calendula**	cape weed	N/A	N/A
Banksia integrifolia	coast banksia	–	–
Callistemon citrinus	crimson bottlebrush		
Casuarina glauca	grey sheoak	–	–
Conyza bonariensis	Flax leaf fleabane	N/A	N/A
Cordyline sp *	red cordyline	–	–
Corymbia maculata	spotted gum	–	–
Cotula australis	carrot weed	–	–
*Cynodon dactylon**	couch	N/A	N/A
Dianella revoluta var revoluta	blue flax-lily	–	–
Doryanthes excelsa	gymea lily	–	–
Eeinadia hastata	saloop	–	–
Ehrharta erecta	panic veldtgrass	N/A	N/A
Eragrostis curvula	african love-grass	N/A	N/A
Eucalyptus botryoides	southern mahogany	–	–
Eucalyptus leucoxylon	yellow gum	–	–
Eucalyptus microcorys	tallowwood	–	–
Eucalyptus utilis	coastal moort		
*Euphorbia hyssopifolia**		N/A	N/A
*Ficus benjamina**	weeping fig	N/A	N/A
Ficus macrophylla	moreton bay fig	–	–
*Gamochaeta pensylvanica**	cudweed	N/A	N/A
Leptospermum laevigatum	coast tea-tree	–	–
Livistona australis	cabbage fan-palm	–	–
Lomandra longifolia	spiny-headed mat-rush	–	–
Melaleuca quinquenervia	broad-leaf paperbark	–	–
Modiola caroliniana	red-flowered mallow	N/A	N/A
*Oxalis pes-caprae**	soursob	–	–
Paspalum dilatatum	paspalum	–	–
*Pennisetum clandestinum**	kikuyu	N/A	N/A
Photinia robusta	photinia	–	–
Poa annua	annual poa	–	–
*Solanum nigrum**	blackberry nightshade	N/A	N/A
Sonchus oleraceus	common sowthistle	N/A	N/A
*Sporobolus africanus**	parramatta grass	N/A	N/A
*Strelitzia sp**	bird of paradise	–	–
Taraxacum offinale spp. agg.	dandelion	N/A	N/A

Source AECOM d2014, pp9–10

* denotes exotic species

– denotes indigenous species not listed under the *EPBC Act* and/or the *TSC Act*

associated with roadways throughout the project area. Species such as bangalay *Eucalyptus botryoides*, spotted gum *Corymbia maculata*, and tallowwood *Eucalyptus microcorys* were present. These trees ranged in height from 15 to 20 metres tall. In a number of patches, brush box *Lophostemon confertus*, had been planted instead of eucalypts as the overstorey species.

A number of patches support a mid-storey comprising species such as grey sheoak *Casuarina glauca*, broad-leaf paperbark *Melaleuca quinquenervia*, crimson bottlebrush *Callistemon citrinus*, and coast banksia *Banksia integrifolia*.

Regardless of the presence of a mid-storey, understorey vegetation throughout the project area was consistently dominated by exotic ornamental shrubs and exotic and native graminoid species such as red photinia *Photinia robusta*, bird of paradise *Strelitzia* sp., Cordyline *Cordyline* sp., gymea lily *Doryanthes excels*, and, less frequently, native planted shrubs such as spiny-headed mat-rush

Table 8.17 Fauna species observed in the project area

Common name	Scientific name	EPBC Act
Black-faced cuckoo shrike	*Coracina novaehollandiae*	Observation
Magpie	*Cracticus tibicen*	Observation
Magpie-lark	*Grallina cyanoleuca*	Observation
Musk lorikeet	*Glossopsitta concinna*	Observation
Noisy miner	*Manorina melanocephala*	Observation
Rainbow lorikeet	*Trichoglossus haematodus*	Observation
Welcome swallow	*Hirundo neoxena*	Observation

Source AECOM d2014, p 10

Lomandra longifolia and blue flax-lily *Dianella revolute var. revoluta*.

The only exception to this understorey structure is provided by the few areas of open grass with scattered trees within the project area. These are areas of manicured open lawns dominated by kikuyu *Pennisetum clandestinum*, panic veldt grass *Ehrharta erecta* and carrot weed *Cotula australis* (which is a native herb species) typically shaded by weeping fig *Ficus benjamina* or cabbage fan palms *Livistona australis*.

Endangered ecological communities

All the vegetation surveyed within proximity to the project area is considered to have been planted for amenity purposes. There are no endangered ecological communities present that are listed under either the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (*EPBC Act*) or the *Threatened Species Conservation Act 1995* (NSW) (*TSC Act*).

Flora species

A list of the flora species identified at the site is provided in **Table 8.16**. A total of 30 species were recorded, comprising 10 exotic species and 20 species considered to be native to NSW.

Threatened flora species

None of the threatened flora species identified as having the potential to occur within the project area were recorded during the field assessment and no suitable habitat for these species was observed within the project area.

Noxious Weeds

No species listed under the *Noxious Weeds Act 1993* for the Botany Bay, Marrickville or Rockdale local government areas were recorded in the project area.

Fauna

Only seven fauna species (all birds) were recorded during the field assessment (see **Table 8.17**). No exotic fauna species were observed during the field survey.

Threatened fauna species

Following the field assessment, it was determined that the project area does not provide permanent habitat for any threatened species identified as having the potential to occur there. No fauna species listed under the *TSC Act* and/or the *EPBC Act* were observed in the project area.

The project area was assessed for the presence of habitat that might be considered suitable for fauna species. Particular attention was paid to those species that are listed under the *TSC Act* and/or the *EPBC Act*.

Weeping fig is known to be a valuable food source for the grey-headed flying fox *Pteropus poliocephalus*. This species is listed as vulnerable under the *TSC Act* and as vulnerable under the *EPBC Act*. This species has been previously recorded within Sydney Airport[100].

There are a number of stands of weeping fig within the project area that could provide habitat for grey-headed flying fox. Four large specimens are located in a strip opposite the end of Seventh Street (see **Figure 8.8**). A single large tree is growing in the road reserve of Qantas Drive opposite the end of Robey Street (see **Figure 8.8**) and a number of smaller trees are located along Sir Reginald Ansett Drive near the intersection of Ross Smith Avenue. All these trees provide potential foraging habitat for the species.

No other vegetation within the project area is considered likely to provide habitat for any fauna species other than common species such as noisy miner and rainbow lorikeet. Indeed, it is considered that only those fauna species capable of flight are likely to regularly use the site. Major roads surround much of the project area and are likely to prevent habitation by any native ground-dwelling fauna.

100 Sydney Airport 2014b p68

8.7.2 Impacts – construction and operation

Construction Impacts

Direct impacts to vegetation

No remnant vegetation was observed in proximity to the location of the proposed T2/T3 Ground Access Solutions and Hotel. All vegetation present, though sometimes comprising indigenous species, has been planted for amenity purposes.

Vegetation was typically dominated by either patches of densely planted overstorey species growing above a mix of native and exotic ornamental shrubs, or as linear features growing above open lawn dominated by exotic pasture grasses. Bangalay, spotted gum, and weeping fig were the most prevalent tree species recorded.

It is likely that the proposed works will require the removal of many of these vegetation types. Based on the current construction footprint, it is likely that the following vegetation removal will be required:

- all mature weeping figs lining the west side of Seventh Street;
- a single large weeping fig on Qantas Drive opposite the end of Robey Street;
- spotted gum and grey sheoak planted at the northern end of the proposed Seventh Street extension;
- a patch of planted native species at the intersection of Ninth Street and Shiers Avenue;
- a single mature bangalay and a single mature tallowwood within the rental car storage area east of the proposed Seventh Street extension;
- a line of semi-mature weeping fig alongside Sir Reginald Ansett Drive;
- cabbage fan palms alongside Sir Reginald Ansett Drive;
- brush box lining Ninth Street;
- spotted gums at the intersection of Ninth Street and Qantas Dive; and
- stands of Spotted gum and understorey plantings on Qantas west of Sir Reginald Ansett Drive and Joyce Drive, east of Sir Reginald Ansett Drive;
- three spotted gums and one broad-leaf paperbark in short-term parking area between P1 East and P2; and
- spotted gums adjoining P2 alongside Shiers Avenue.

None of the vegetation to be impacted is considered an endangered ecological community under either the *EPBC Act* or the *TSC Act*. None of the vegetation recorded is classified as significant within the Sydney Airport Environment Strategy 2013–2018[101].

The proposed T2/T3 Ground Access Solutions and Hotel development will likely incorporate both overstorey trees and understorey vegetation into the design of both water quality treatment designs and in the proposed landscaped gateway into the precinct from Qantas Drive.

Direct impacts to threatened flora and fauna species

No threatened species were observed during the field assessment and it is unlikely that the project area provides anything more than temporary habitat for threatened species. There is a very low likelihood of detrimental impacts to threatened flora and/or fauna species as a result of the proposed works.

Many of the plantings of weeping fig in proximity to the proposed works are considered to be representative of the standard cultivar in that they have a single straight trunk with foliage considered denser than is typical for the species. There is potential that the density of the foliage may actively discourage the grey-headed flying fox from using these trees as a food source. Grey-headed flying foxes typically harvest fruit by plucking it from the tree with their teeth, requiring that branches are available within the canopy for the flying foxes to grip with their claws. Many of the trees surveyed did not appear to provide the space within the canopy to allow the flying foxes to feed in this way and, as such, it is considered that this vegetation provides low value habitat for the species.

The large spreading specimens that are planted alongside the location of the proposed Seventh Street extension and the single tree opposite the end of Robey Street are likely to provide more suitable habitat for the grey-headed flying fox during the spring-summer fruiting period. These trees will be removed as part of the proposed works and result in the permanent loss of habitat for grey-headed flying foxes within the project area.

The potential for impacts to grey-headed flying foxes that may use these trees can be avoided by removing the trees during the winter months (non-fruiting period) when the species is highly unlikely to be using the site. Should timing of the construction works prevent the removal of the trees during the winter months, active survey of these trees by trained ecologists could be undertaken during the fruiting period to confirm or otherwise the use of the habitat by grey-headed flying foxes.

Potential indirect impacts

There is potential for indirect impacts to any retained vegetation adjacent to the location of the proposed works, particularly during construction. Such indirect impacts may include but are not limited to:

101 Sydney Airport 2014b

- the compaction of the soil profile by heavy construction machinery;
- loss of vegetation not earmarked for removal;
- the potential for ground disturbance to encourage the spread of weed species within the project site; and
- increased sedimentation and/or run-off during construction works.

The vegetation that may be retained following the construction of the proposed T2/T3 ground access solutions and hotel is likely to be of little ecological significance and is unlikely to provide habitat for any fauna species listed under either the *EPBC Act* or *TSC Act*. As such, the risk of any indirect impacts to this vegetation is low.

There is also some potential for indirect impacts to the aquatic habitat of Cooks River/Alexandra Canal and Mill Stream as a result of the proposed changes to the drainage design within the project area. Much of the drainage catchment of the extent of works will flow north although some will flow south, using existing drainage infrastructure to carry water to a drainage outlet located south of General Holmes Drive and downstream of the Mill Pond Weir. However, it is extremely unlikely that the fauna habitat provided by both Mill and Engine Ponds will be impacted by the works.

Operation Impacts

There are unlikely to be any operational impacts to the vegetation values at the project area. All impacts will occur during the construction phases of the proposed T2/T3 Ground Access Solutions and Hotel development. The works will result in the removal of all potential habitats within the project area for the grey-headed flying fox, thereby discouraging the use of the project area by this species. All other vegetation assessed is considered to provide habitat for only common bird species.

There is some potential for operational impacts to water quality of both Engine Pond East/Mill Stream (downstream of the weir) and Cooks River/Alexandra Canal as a result of surface water run-off and the discharge of contaminants into the stormwater network (which eventually discharge into either Mill Stream or Cooks River/Alexandria Canal). This has the potential to impact on the aquatic habitat provided by these watercourses. Adverse impacts are unlikely given that surface water quality treatment devices would be installed as part of the project design (see Section 8.3.3) and the habitat values provided by each watercourse is of low quality given the disturbance within the catchments of the watercourses.

8.7.3 Mitigation measures – construction and operation

A construction environmental management plan (CEMP) will be prepared to inform the construction activities with the project area. The CEMP will provide guidance on mitigating environmental impacts during demolition and construction and should clearly define the extent of vegetation removals within the project area and detail the use of appropriate sediment and/or other control measures.

The CEMP will also address measures to ensure that there is little risk of impact to vegetation that has not been marked for removal. Construction laydown areas will be clearly delineated, and storage of machinery and materials should be only within the confines of these designated areas. Access to and exit from the works areas will be restricted to designated routes. This will limit compaction of the soil profile within the vicinity of those trees to be retained.

There are two options available to minimise the risk to grey-headed flying foxes that may use the weeping fig trees as a food resource during the fruiting period in spring/summer, namely:

- should timeframes for construction of the project allow, these trees could be removed over the winter months and prior to fruiting;
- alternatively, a targeted survey could be undertaken across the site to determine whether the species does indeed use this food resource. If their absence from the site is determined by this assessment, the trees can be removed at any time of the year.

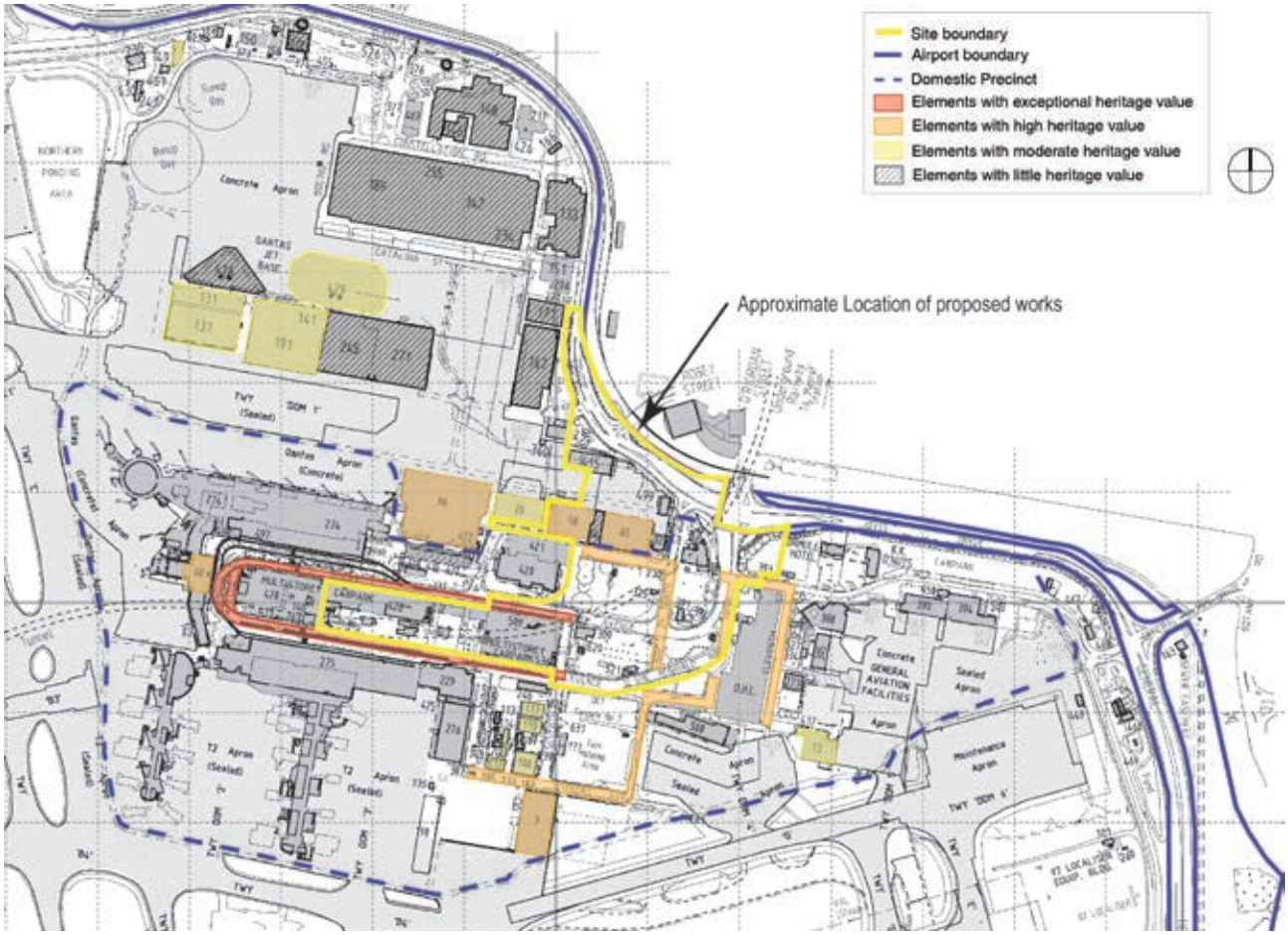
The Surface Water Impact Assessment[102] details the mitigation and management measures that would be implemented during demolition, construction and operation of the proposed T2/T3 Ground Access Solutions and Hotel development. Both administrative controls (through the provisions of a CEMP) and practical controls such as sediment and erosion control and appropriate surface water run-off management would minimise the potential for impacts on the existing water quality within the project area.

8.8 Heritage

Sydney Airport is one of the oldest continually operating airports in the world. Prior to it being an airport, the land on which the airport is situated also played host to a number of other significant pieces of industrial and water supply infrastructure.

102 AECOM 2014b

Figure 8.9 Project Area in relation to T2/T3 precinct



Source GML Heritage 2014, p 8.

Sydney Airport acknowledges that there is heritage value associated with the airport and the airport site. The heritage values are associated with the airport as a whole and are embodied in the location, form and function of its individual elements, including the arrangement of streets, buildings, runways and the ways in which these attributes reflect its history of change and growth.

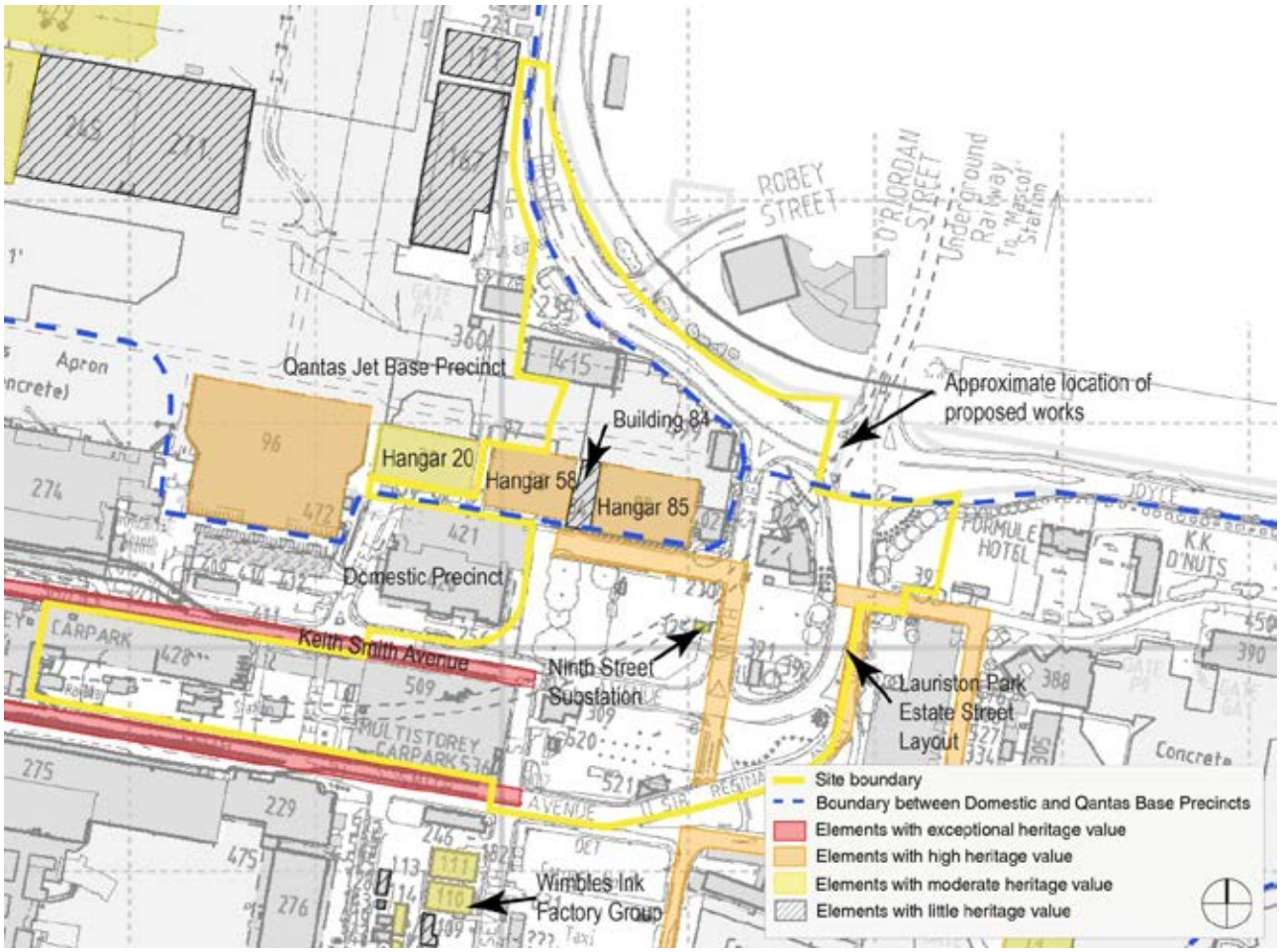
Sydney Airport has a heritage management plan (HMP) in place that provides guidance with respect to future conservation policies and management strategies to maintain and protect the heritage values where practicable. This is balanced with the need for the airport to continue to develop to meet the growing needs of airlines and passengers. In fact, one of the key themes used to guide heritage management at Sydney Airport in the HMP, as documented by consultants GML Heritage, is the theme of continual renewal. The fast pace of development of air transport over the last century has meant that airports must change and expand to meet the demands of a growing number of passengers as well as advances in aircraft technology.

As recognised within the recently approved Sydney Airport Master Plan 2033 and Sydney Airport Environment Strategy 2013-2018, as this growth and associated development occurs, developments will inevitably have heritage related impacts. Sydney Airport is committed to minimising and managing these impacts.

The impacts of the proposed T2/T3 Ground Access Solutions and Hotel on heritage elements are identified in the following section. Having regard to the heritage significance of the airport as a whole, the proposed development would have a moderate level of heritage impact. Elements of exceptional heritage value (highest level of value), as identified in the HMP, are retained and not impacted.

Following consideration of the HMP, including conservation policies, during the concept phase of this proposal, a specialist investigation was then undertaken to assess the heritage impacts of the proposed development and to guide appropriate management for any identified adverse impacts. This investigation is reported in Sydney Airport T2/

Figure 8.10 Elements of heritage value within the project area



Source GML Heritage 2014, p 9.

T3 Ground Access Solutions and Hotel Major Development Plan – Heritage Impact Assessment[103]. Key findings of this investigation are presented below.

It should be noted that, for this section of the MDP, official lease boundaries for the Jet Base do not directly accord with those boundaries established in the HMP for the north-east sector of the airport.

8.8.1 Identified heritage items

Indigenous cultural heritage

The NSW Office of Environment and Heritage (OEH) maintains a Register of Aboriginal Sites which is the main source of information about aboriginal sites in NSW. The site and relics listed on the register are protected under the *National Parks and Wildlife Service Act 1974* administered by the OEH.

Airport-wide archaeological investigations have concluded that there are no prehistoric or historic aboriginal sites or areas of potential archaeological sensitivity within the airport boundary[104]. Sydney Airport has also confirmed this finding on a number of occasions through the Metropolitan Local Aboriginal Land Council[105].

Non-indigenous cultural heritage

Heritage listings

Within the airport boundary, there are a number of heritage items listed on state and local statutory heritage registers. None of these items are located within the project area or in the immediate vicinity of the proposed works.

The *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) provides for the protection of Commonwealth-owned heritage places. As the airport is located on Commonwealth land, it is subject to the heritage provisions of the *EPBC Act*.

The Commonwealth Heritage List (CHL) is a list of heritage places owned or managed by the Commonwealth

103 GML Heritage 2014

104 Biosis Research 2001, as reported in Environment Strategy 2013-2018, p71

105 Sydney Airport 2014b, p71

Table 8.18 Assessment of impacts on identified heritage elements

Element	Proposed action and heritage impact	Relative heritage ranking	Tolerance for change
Elements located partly within the project area			
Jet Base	Removal of a section of the Southern Hangar Line to enable construction of the Ground Transport Interchange Impact on element which contributes significantly to airport's heritage values	High	Low – location, function High – fabric
Lauriston Park estate street layout	Removal of a portion of Ross Smith Avenue and reconfiguration of the southern end of Ninth Street, which form part of the Lauriston Park estate street layout Impact on heritage significance of Lauriston Park estate and a minor impact on airport's heritage values	High	Low – form, location High – fabric Scope for adaptation
Elements located fully within the project area			
Hangar 58	Removal Impact to airport's heritage values	High	Low - location, function High – fabric
Hangar 85	Removal Impact to airport's heritage values	High	Low – location, function High – fabric
Workshop and Storehouse Building 84	Removal Minor impact	Little	Low – location High – fabric, form function
Ninth Street substation	Decommissioning and removal New substation to be built at another location Minor impact	Moderate	Low – location, function Some – form High - fabric
Buildings 98 and 129	Removal No impact on heritage values	Neutral	N/A
P1 East Car Park (Building 428)	Removal and replacement with new 10 level car park No impact on heritage values	Neutral	N/A
Elements in the vicinity of the project area			
Hangar 96	Construction of 10 level car park (P1 East) to the south No impact on heritage values.	High	Low – location, function High – fabric, form
Keith Smith Avenue	No change. However development of Shiers Avenue/ Seventh Street extension intersection adjacent Keith Smith Avenue No impact on heritage values	Exceptional	Low – form and function High – fabric
Hangar 20	Hangar 20 is retained Minor impact due to removal of adjacent Hangars 58, 85 and Building 84. road along the southern (rear) wall of the hangar	Moderate	Low – location, form and function High – fabric

Government. The Sydney (Kingsford Smith) Airport Group is listed as an indicative place on the CHL, established under the *EPBC Act*.

Sydney Airport's HMP further defines the built, landscape and archaeological elements at the airport that are considered to contribute to the overall heritage values of the airport site. Those elements associated with the project site are discussed in the next section.

Elements of heritage value

As shown in **Figure 8.9**, the proposed T2/T3 Ground Access Solutions and Hotel development will be located in the T2/T3 precinct.

The following elements of heritage value are located either partly, fully or within the immediate vicinity of the project area (see **Figure 8.10**):

Figure 8.11 Heritage elements partly, fully or in the vicinity of the project area

ELEMENTS LOCATED PARTLY WITHIN THE PROJECT AREA

Lauriston Street layout

Jet Base

ELEMENTS LOCATED FULLY WITHIN THE PROJECT AREA

Hangar 58

Hangar 85

Ninth Street substation

Workshop and Storehouse (building 84)

Keith Smith Avenue

Hangar 20

Source GML Heritage 2014

- Jet Base;
- Hangar 58, Hangar 85 and Hangar 20 (Southern Hangar Line, Jet Base);
- Lauriston Park estate street layout;
- Ninth Street substation (within the Lauriston Park estate street layout);
- Workshop and Storehouse Building (Building No. 84) (within the Jet Base); and
- Keith Smith Avenue (including Terminal Court and Shiers Avenue).

All other buildings and structures in the project area, including the P1 East and P3 car parks and Buildings 98 and 129 behind Hangar 20, have neutral heritage value.

8.8.2 Impacts

Indigenous cultural heritage

The construction of the proposed T2/T3 Ground Access Solutions and Hotel development will not impact any registered Aboriginal sites. The cleared and disturbed nature of the site (see Section 8.2) suggests that it would be extremely unlikely that there would any undetected Aboriginal sites in the project area.

Non-indigenous heritage

The impacts of the proposed T2/T3 Ground Access Solutions and Hotel development on heritage elements are identified in **Table 8.18** having regard to heritage management policies and guidelines presented in the HMP. Heritage impacts resulting from implementation of this project are consistent with what was foreshadowed in the Master Plan 2033 and the Sydney Airport Environment Strategy 2013-2018.

Several elements (known as the Southern Hangar Line, Jet Base) are proposed to be demolished to accommodate the proposed development as well as the Ninth Street substation. In addition, there would be lesser impacts on other elements of heritage value such as the Lauriston Park estate street layout (see **Figure 8.11**).

Sydney Airport is proposing measures to ensure an appropriate level of mitigation of environmental impacts is achieved.

Hangars 85 and 58 form part of the Southern Hangar Line and are an early and significant example of maintenance hangars in Australia and have been used in varying ways since the 1940s. The proposed change of use and the removal of two hangars would impact on the heritage value of the airport's maintenance base and would have an adverse impact on the heritage significance of the airport as a whole.

Preservation and relocation of the hangars was considered and deemed not practicable or feasible. Sydney Airport has proposed mitigation measures to ameliorate the moderate heritage impact.

While the proposed Ground Transport Interchange and hotel buildings are significant in scale, the buildings are similar in form to adjacent car parks and hotels such as the Stamford Plaza Hotel, and the contemporary design represents a new phase of development at Sydney Airport.

The proposed buildings would further intensify the density of built form in the Domestic Precinct and would extend this density into the far eastern corner of the Jet Base. While the buildings would be located close to similarly scaled car park buildings in the T2/T3 precinct, the proposed buildings in the Jet Base would have an adverse impact on the low-scale character and visual setting of the Jet Base. This would be compounded by the proposed three storey addition to P3 and the 10 level redevelopment of P1 East, which would be visible beyond Hangar 20 in views from the Jet Base.

The location of the proposed buildings would obscure important remaining visual links in the area. However, it would not impact on significant views identified in the HMP, such as views of the Jet Base from the international terminal, or significant public views of the airport.

The Lauriston Park estate street layout is historically significant as it is the last of the original housing subdivisions that existed before the establishment of the aerodrome precursors to the airport approximately 100 years ago. The reconfiguration of Ninth Street and partial removal of Ross Smith Avenue west of Sir Reginald Ansett Drive and the proposed alterations and enlargement of more recent roadways would alter the former street pattern of the original Lauriston Park estate housing subdivision. Demolition of the Ninth Street substation would increase this heritage impact through removal of the last building associated with the Lauriston Park estate. As a result, the proposed T2/T3 Ground Access Solutions and Hotel development would have an adverse impact on the heritage values of the Lauriston Park estate.

While the T2/T3 Ground Access Solutions and Hotel are consistent with the ongoing history of rapid technological change and development at the airport site as documented in the HMP, the loss of the Southern Hangar Line and sections of the residual Lauriston Park estate street layout would remove evidence of phases of the airport's historical development that contribute to its overall heritage value.

Having regard to the heritage significance of the airport as a whole, the proposed development would have a moderate

level of heritage impact. An appropriate level of mitigation can be achieved through a range of proposed measures. Elements of exceptional heritage value (highest level of value), as identified in the HMP, are retained and not impacted.

8.8.3 Avoidance, mitigation and management

Indigenous heritage

Although there are no indigenous cultural heritage sites identified on the site for the proposed T2/T3 Ground Access Solutions and Hotel development, should a site be discovered during construction, established protocols would be followed. These protocols include immediate cessation of construction activities to allow assessment of the site and formulation of appropriate actions.

Non indigenous heritage

Avoidance

The planning process for the development of the MDP considered key Master Plan 2033 principles to improve the overall passenger experience to upgrade both airside (integrated terminal precincts and airfield upgrades) and landside (ground access) facilities. The upgrades are ultimately being undertaken to meet the growing needs of passengers and airlines as the demand for air travel continues to increase.

To facilitate the forecast increase in passenger numbers and improve passenger amenity, the proposed airside and landside developments will result in changes to current land uses in the T2/T3 precinct. A key priority is to improve the on-airport road network to make it easier for airline passengers, airport workers and other airport visitors to travel to and from the airport by car, taxi or public transport. The construction of a new road to provide the main exit function will create a better performing one-way road network through the T2/T3 precinct, increase the capacity of major intersections, significantly improve traffic flow, and reduce traffic congestion. This in turn establishes the land use and road framework for the future development of the precinct.

Concepts and options considered for the main exit road for the T2/T3 precinct include:

- using Ninth Street exclusively;
- development of an overpass from Sir Reginald Ansett Drive to Joyce Drive (Master Plan 2009); and
- development of Seventh Street extension.

The first two concepts may have resulted in a different development footprint and therefore avoidance of Hangar 58, Hangar 85 and the Ninth Street substation. However, these would result in intersection designs with low efficiency and capacity, and would not cater for the expected throughput of vehicles (see Chapter 7) by 2018. Although the land use implications and therefore impacts are relatively minor, they do not provide the required capacity improvements and benefits for landside ground access. This would be detrimental to the passenger experience as this would increase internal traffic congestion as traffic would not be able to exit the precinct efficiently, a situation that will be exacerbated by increasing congestion on the adjacent arterial road network at Qantas Drive.

By comparison, the last option, which is the subject of this MDP, links the existing Seventh Street and Robey Street, permitting existing intersections to be augmented, and Qantas Drive to be widened to cater for airport as well as through traffic. Refer to Chapter 7 for further details. This option was the only option considered feasible and able to deliver changes required to the airport road network.

Mitigation and management

Consideration of relocation of Hangars 58 and 85

The relocation option for Hangars 58 and 85 would not substantially mitigate the heritage impacts resulting from their demolition because their heritage value primarily derives from their location in the Jet Base. Sydney Airport has considered relocation of these hangars but does not consider relocation practical or feasible due to the following:

- safety issues including the potential presence of hazardous materials as well as potential structural issues associated with relocation;
- physical constraints such as space requirements for buildings such as hangars;
- the redundant nature of such facilities; and
- off-site relocation would not substantially mitigate the heritage impacts.

The following measures are proposed to mitigate the moderate level of impact on elements of heritage value within the project area:

Interpretation strategy

- Preparation of an interpretation strategy – A heritage interpretation strategy is currently being prepared for the proposed T2/T3 Ground Access Solutions and Hotel. This strategy will primarily interpret the history and significance of the Southern Hangar Line, Jet Base and the Lauriston Park estate. The strategy will define and recommend a variety of interpretative methods and media, including on-site interpretation such as artworks, installations and inlays, and off-site methods such as

websites and web-based applications. Opportunities to provide an interpretative experience to airport visitors along the proposed pedestrian experience (walkway), which will connect the Ground Transport Interchange with the main entrances to T2 and T3, will be considered during the preparation of the Interpretation Strategy.

Archival recording

- In accordance with standard conservation practice and relevant standards, and with the assistance of GML Heritage, Sydney Airport has prepared archival recordings for Hangar 58, Hangar 85 and the Ninth Street Substation. The photographic archival recording would capture elements of heritage value including interiors and exteriors of the structures and details such as machinery or decorative details. The archival recording would document these elements in use, as the activities that take place within each site contribute to each element's heritage value and the heritage value of the airport as a whole.
- Measured drawings would be prepared for the elements of moderate and high heritage value that are proposed for demolition. Measured drawings would record the form and materials of each element as well as any special details, such as decorative elements or original fabric.

The Heritage Interpretation Strategy and a copy of the archival recordings will be submitted to the Airport Environment Officer prior to the removal of any element with heritage value, as described above.

Sydney Airport is also exploring the concept of developing an experience centre for the community.

8.9 Cumulative impacts

8.9.1 Approach to cumulative assessment

The *Airports Act 1996* does not explicitly require consideration of the cumulative impacts of a 'major airport development' in a MDP. However, Sydney Airport considers that it is appropriate to include such an assessment in this MDP to provide information that will assist Sydney Airport and other relevant stakeholders to co-operatively manage any resultant concurrent and/or cumulative impacts during the construction and operation of the T2/T3 ground access solutions and hotel.

This section considers other development projects, such as other on airport developments or known residential and hotel developments in the Mascot area, which may have concurrent construction and/or operational periods with the T2/T3 Ground Access Solutions and Hotel development.

8.9.2 Concurrent developments on and in the vicinity of the airport

Approved development projects at the airport that may be constructed concurrent with the proposed T2/T3 Ground Access Solutions and Hotel development are listed in **Table 8.19** in terms of the likely sequence of construction.

It is understood that a number of residential and hotel development projects in the Mascot area to the east of the airport are being planned or have received development approval.

8.9.3 Traffic impacts

Construction traffic

Traffic during the estimated 12 month construction period for the proposed landside bridge across Alexandra Canal to provide access to the northern lands and the intersection with Airport Drive would use both Airport Drive and Bellevue Street to the north of the site area. All relevant construction zone road traffic and safety management requirements consistent with those of RMS would be implemented by the contractor during works on or near Airport Drive[106].

The construction of the proposed hotel on Ross Smith Avenue is expected to take approximately 12 months. The construction traffic impacts will involve building and construction vehicles entering and leaving the site and the construction workers parking area each day. Access for construction vehicles is expected to be from Ross Smith Avenue via Lords Road or Sir Reginald Ansett Drive. An estimated 60 construction vehicles (including workers vehicles) could arrive and depart the site and the parking areas on busy work days with between 5 and 10 construction vehicles an hour outside peak hours. Busy days for trucks accessing the site may include up to 30 vehicle movements a day but, on most days, truck numbers would average between 5 and 10 vehicles[107]. This level of traffic generation is not expected to cause significant traffic delays on the road network adjacent the proposed hotel site.

Sydney Airport has well-established protocols for the management of construction traffic so that the impacts on the airport's road network and airport-related traffic are mitigated to provide continued efficient ground access.

Depending on the location of off-airport development projects, their construction may result in some increases in traffic through intersections which also provide access to the T2/T3 precinct such as O'Riordan and Robey Streets, Joyce Drive and O'Riordan Street or Qantas Drive and Robey Street. However, given the substantial traffic

106 Sydney Airport 2012, p17 and p34

107 Sydney Airport 2013, p27

Table 8.19 Concurrent construction projects on the airport

Project	Status	Construction jobs and timing (estimated maximum no.)	Construction period (estimated no. of months)	Location relative to proposed development
T1 ground access improvements	Under construction	50 day and night shifts	42 months from early 2014 to late 2017	Approximately 3.0km by road, Airport Drive and Qantas Drive
Landside bridge over Alexandra Canal	Approved, due to commence construction early 2015	30 some night-time piling activities	12 months	Approximately 3.0km by road, Airport Drive and Qantas Drive
Hotel on Ross Smith Avenue	Approved, no commitment to construction	50 some night-time work	12 months	Immediately adjoins on eastern boundary

Notes

1 Sydney Airport. 2013a. T1 Ground Access Improvements – Review of Environmental Factors.

2 Sydney Airport. 2012. Northern Lands Airport Logistics Precinct – Landside Bridge, Intersection, At-Grade Vehicle Storage and Physical Infrastructure – Review of Environmental Factors.

3 Sydney Airport. 2013b. Proposed Hotel, Ross Smith Avenue, Domestic Precinct, Sydney Airport – Review of Environmental Factors.

volumes that use the arterial road system in the vicinity of the T2/T3 precinct, any additional traffic generated during the concurrent construction of off-airport projects would be insignificant.

Operational traffic

The proposed T2/T3 ground access solutions to, from and within the T2/T3 precinct will improve overall traffic performance with forecast improvements on the performance of nearby gateway intersections (see Section 7.3)

However, ongoing capacity constraints on the wider road network around the airport, which are the responsibility of others such as RMS, will continue to result in peak period congestion beyond the T2/T3 precinct. The proposed WestConnex and M5 widening projects will help address existing issues on the wider network. These projects are the responsibility of the NSW State Government and beyond the jurisdiction of Sydney Airport (see Chapter 5).

The 11km section of WestConnex that will run from St Peters to the east of the airport to Beverly Hills has been identified as Stage 2 of this project with planning to take place between 2013 and 2017 and construction between 2016 and 2020. Based on this timeframe, the T2/T3 Ground Access Solutions and Hotel will be largely complete before construction of Stage 2 of WestConnex commences. However, Sydney Airport will continue to consult with key stakeholders in relation to ground access to, from and around the airport.

As the proposed hotel is estimated to generate a maximum of about 5 to 6 vehicles an hour in either direction along Ross Smith Avenue[108], together with the proposed capacity enhancements eastwards on Ross Smith Avenue between Lords Road and Eleventh Street as well as those delivered through the T2/T3 Ground Access Solutions, there would not be any adverse cumulative impact of the combined operational traffic.

8.9.4 Ground noise impacts

Construction

The construction of the proposed T2/T3 Ground Access and Hotel is likely to require some construction activities to be undertaken overnight (see Section 4.8). The three potential concurrent on-airport projects identified in **Table 8.19** may all require some night-time construction activities to either reduce daytime traffic impacts or potential incursions of cranes above the OLS. Given the relatively low night-time noise management levels (NMLs) for the closest residential areas, if there were to be any concurrent night-time construction work, there may be potential for exceedances of the relevant NML at the nearest residential and/or commercial receivers such as hotels.

As the potential concurrent construction projects listed in **Table 8.19** will all be controlled by Sydney Airport, management measures would be put in place to ensure adequate management or limitation of night-time construction work on projects close to the T2/T3 construction site(s).

108 Sydney Airport 2013, p40

8.9.5 Air quality impacts

Construction

The construction of the proposed T2/T3 ground access solutions and hotel may require some construction activities to be undertaken concurrently (see **Table 8.19**). The three potential concurrent on–airport projects identified in **Table 8.19** all may require some earthworks or other activities that have the potential to generate dust.

As the potential concurrent construction projects as well as the T2/T3 construction will all be controlled by Sydney Airport, management measures would be put in place to ensure that there is no concurrent work on projects that would generate dust – both for environmental reasons and air safety reasons given the proximity of operational runways and taxiways.

8.10 Airport environmental management system

Sydney Airport has adopted a risk-based approach to environmental management at the airport incorporating the environment strategy and Sydney Airport's environmental management system (EMS) to control identified environmental risks and to achieve a high standard of environmental management.

Sydney Airport has developed and maintains its EMS which, as required by Clause 5.02B of the *Airports Regulations 1997*, is intended to maintain consistency with relevant Australian and international standards. The relevant standard is AS/NZS ISO14001 Environmental Management Systems – Requirements with Guidance For Use.

The EMS provides the system by which daily environmental management can be planned, implemented and reviewed, thus ensuring a cycle of continuous environmental improvement. Sydney Airport's EMS comprises the following main components:

- environment policy;
- planning – including environmental aspect and risk identification and assessment, objectives, targets and action plans;
- implementation and operation – including environmental responsibilities, training and awareness, communication, document and operational control, and emergency preparedness and response;
- checking – including monitoring, assessment and auditing; and
- management review.

Contractors engaged by Sydney Airport are expected to comply with the environment strategy, the *Airports Act 1996* and regulations. Contracts are assessed on a case-by-case basis, with those identified as carrying significant potential risk – such as the T2/T3 Ground Access Solutions and Hotel – requiring the development of an environmental management plan (EMP).

EMPs ensure that the activities and environmental effects associated with the contract are identified and management actions implemented to reduce environmental risk and prevent or minimise environmental impacts. The EMP is required to be provided to Sydney Airport's environment department and provides the basis for environmental auditing of the contractor. Sydney Airport's relevant project manager, in consultation with the environment department, ensures compliance with the EMP. The EMPs for the T2/T3 Ground Access Solutions and Hotel will also be submitted to the Airport Environment Officer for approval.

8.11 Outcomes of the environmental assessment

The outcomes of the environmental assessment for the T2/T3 Ground Access Solutions and Hotel development are summarised below:

For the purposes of the *Airports Act 1996*, the proposed development is not considered:

1. a development of a kind that is likely to have significant environmental or ecological impact; or
2. a development which affects an area identified as environmentally significant in the environment strategy

For the purposes of the *Environment Protection and Biodiversity Conservation Act 1999*, the proposed development:

1. will not, or is not likely to, have a significant impact on a matter of national environmental significance; and
2. is not likely to have a significant impact on the environment on Commonwealth land

The environmental impacts of the proposed development are summarised in **Table 8.20** for both the construction and operational periods.

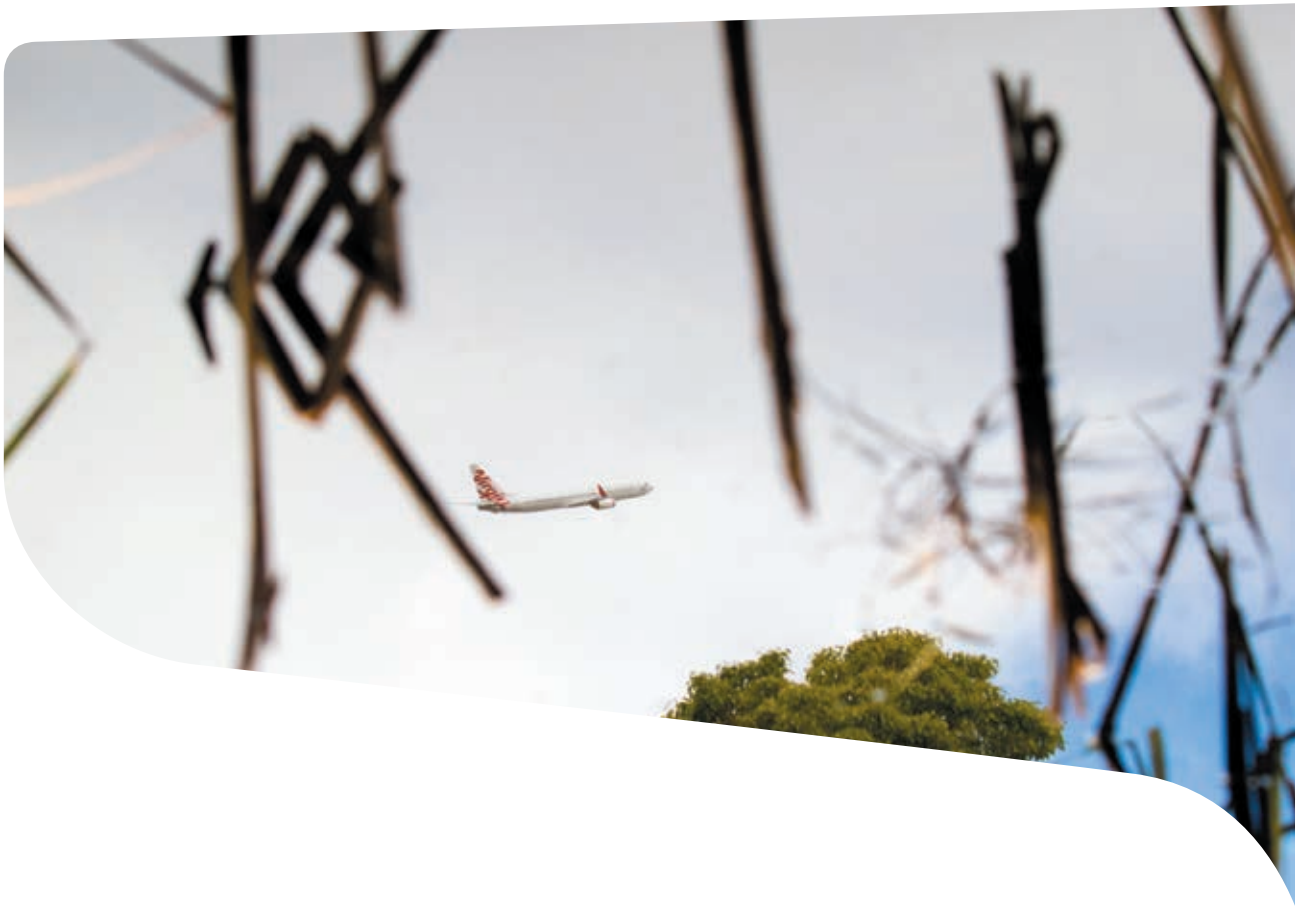
Table 8.20 Summary of environmental impacts – construction and operation

Impacts – potential or unavoidable	Mitigation measures or further investigations	Level of residual impact
CONSTRUCTION		
Soil and groundwater contamination		
Potential for soil and groundwater contamination from sources including: • leakage and spillage of fuels and oils • imported fill • hazardous building materials • acid sulphate soils	Preparation of a detailed site investigation Survey of buildings to be demolished for hazardous materials Development and implementation of a construction environmental management plan (CEMP) including implementation of an 'unexpected finds' protocol Testing of areas to be excavated for acid sulphate soils	Low to moderate
Surface water quality		
Potential for erosion and sedimentation during demolition, earthworks and construction (stockpiled materials)	Preparation and implementation of soil and water management plan as part of the CEMP	Low to moderate
Potential for polluted groundwater during dewatering of deep excavations	Preparation and implementation of groundwater management plan as part of the CEMP	Low
Potential for localised spills from machinery and equipment	Responsible operation and maintenance of machinery Availability and use of spill kits	Low
Ground noise and vibration		
Potential for exceedances of adopted noise management levels at residential and non-residential properties	Preparation and implementation of construction noise management plan as part of the CEMP including best practice equipment use and other measures such as: • minimising night-time works near closest residential and non-residential receivers • implement a communications plan, including liaison with local hotel operators and residents, and complaints management system	Low to moderate
Air quality		
Potential for annoyance due to dust deposition and visible dust plumes Potential for elevated PM10 concentrations due to dust-generating activities Potential for exhaust emissions from diesel-powered construction equipment.	Preparation of a dust management plan as part of the CEMP	Low
Hazard and risk		
Potential incidents during construction and commissioning of the QTA refuelling facility.	Preparation of a comprehensive safety management system to manage hazards and risks during construction and commissioning. Preparation of a risk assessment during design to identify what control measures need to be introduced to ensure a level of risk when operational so far as is reasonably practicable (SFARP).	Low
Ecology		
Loss of native vegetation planted for amenity – approximately 30 trees	Consider reduction in tree/vegetation loss during detailed design	Low
Loss of potential habitat (four weeping fig trees) for vulnerable grey-headed flying fox	Remove affected trees over the winter period prior to fruiting or, following targeted survey to determine if trees are being used as a food source, remove at any time if no grey–headed flying foxes present	Low to moderate
Potential impacts on retained vegetation such as damage to vegetation that has not been marked for removal	The CEMP will provide guidance on mitigating impacts during demolition and construction including defining the extent of vegetation removal within the project area	Negligible

Table 8.20 Summary of environmental impacts – construction and operation

continued

Impacts – potential or unavoidable	Mitigation measures or further investigations	Level of residual impact
Heritage		
Demolition of the following buildings with heritage value: • Hangar 58 • Hangar 85 • Ninth Street substation • Workshop and Storehouse - Building 84 Removal of: • A portion of the Lauriston Park estate street layout	A heritage impact assessment has been carried out Archival recording of buildings has been undertaken. A heritage interpretation strategy will be prepared	Moderate
OPERATION		
Soil and groundwater contamination		
Potential for soil contamination once road upgrades and buildings constructed	Appropriate siting, design, selection and management of the fuel storage and dispensing facility	Low
Surface water quality		
Potential for contamination of surface run-off from external impervious surfaces	Design-in feasible measures such as green roofs and passive filtration to reduce contaminated run-off Management of surface water run-off to reduce volume and reuse run-off where feasible	Low
Potential for direct discharge of contaminants to the stormwater network	Design-in containment measures where required	Low
Ground noise		
Potential for unacceptable level of noise to be generated, particularly road traffic noise	No specific mitigation is proposed as noise modelling indicates noise levels acceptable Sydney Airport will continue to implement its airport environment strategy to minimise ground based noise emissions from airport operations generally	Negligible
Air quality		
Potential for unacceptable changes to local air quality, particularly associated with vehicle movements	No specific mitigation is proposed as air quality dispersion modelling indicates air emissions changes are not measurable Sydney Airport will continue to implement its airport environment strategy to improve air quality or minimise air quality impacts from airport operations generally	Negligible
Hazard and risk		
Potential hazards include exposure to heat radiation and smoke as a result of potential fires associated with operation of the QTA refuelling facility	Preparation and implementation of a comprehensive safety management system to manage operational hazards and risks	Low
Ecology		
Potential for impacts to water quality and aquatic habitat of both Mill Stream (downstream of the weir) and Alexandria Canal and Cooks River as a result of surface water run-off and discharge of contaminants into the stormwater network	Surface water quality treatment devices would be considered as part of the project design	Negligible




T2
T2 Valet
Premium Valet
T3
P
Pronto V
LOW CLEARANCE 4.4m

Chapter 9

Economic and Community Assessment

CHAPTER

9 / ECONOMIC AND COMMUNITY ASSESSMENT

KEY POINTS

- Sydney Airport is one of Australia's most important pieces of infrastructure. Directly and indirectly, it generates and facilitates:
  - economic activity equivalent to 6 per cent of the NSW economy; and
  - almost 300,000 jobs.
- Sydney Airport is committed to meeting the needs of its customers and delivering a passenger experience that the community is proud of through:
  - continued investment in facilities, capacity, safety and security;
  - continuing to achieve high passenger service levels; and
  - expanding the domestic and international route network for passengers and contributing to tourism and trade growth in Australia.
- The proposed development will benefit passengers, airport visitors, local communities and the economy with:
  - the construction period generating an estimated 2,880 direct and indirect full time jobs;
  - the operation of the hotel and Ground Transport Interchange providing an estimated 181 direct and indirect permanent jobs;
  - substantial direct and indirect economic benefits to the NSW economy as a result of capital expenditure, in particular during both the construction and operational periods;
  - improvements to traffic circulation within and beyond the T2/T3 precinct providing increased capacity in line with forecast passenger increases and addressing known congestion points;
  - improve active transport facilities promoting the use of cycling and walking as modes to and from the airport;
  - the high standard Ground Transport Interchange providing increased capacity to serve public buses and promoting a modal shift to public transport; and
  - the proposed hotel benefiting airport users, airline staff and other client groups on a highly accessible site at the entry to the T2/T3 precinct that is readily accessible to both terminals.
- Sydney Airport recognises there are identified potential or unavoidable construction and operational impacts of the proposed development. However, through various mitigation measures and a robust communications strategy the residual impact was assessed as being low to moderate.
- Sydney Airport is committed to on-going community and stakeholder engagement during the construction phases of the proposed T2/T3 Ground Access Solutions and Hotel to ensure the impacts of construction are understood by all and managed accordingly.

THE PROPOSED DEVELOPMENT WILL DELIVER SIGNIFICANT ECONOMIC, SOCIAL AND COMMUNITY BENEFITS. THIS CHAPTER IDENTIFIES AND ASSESSES IMPACTS OF THE PROPOSED DEVELOPMENT, PARTICULARLY IN RELATION TO THE POSITIVE ECONOMIC AND EMPLOYMENT OUTCOMES, THE VISUAL ENVIRONMENT, AND LOCAL AND REGIONAL COMMUNITIES.

9.1 Economic and community assessment overview

Detailed economic and community assessments were undertaken with the findings summarised in the following sections.

The key economic and community benefits of the proposed development are:

- improvements to traffic circulation within and beyond the T2/T3 precinct to provide increased capacity in line with forecast passenger increases;
- improved active transport facilities promoting the use of active transport modes to and from the airport;
- increased capacity to serve public buses and promote a modal shift to public transport;
- substantial direct and indirect economic benefits to the NSW economy as a result of capital expenditure, in particular during both the construction and operational periods;
- substantial employment benefits, especially during the construction period with total direct and indirect full time positions estimated at 2,880 (see **Table 9.1**). In addition, the operation of the Ground Transport Interchange and hotel is estimated to provide 181 direct and indirect equivalent permanent jobs (see **Table 9.2**);
- visual enhancements to one of the airport's key gateways and the addition of two medium rise buildings of attractive contemporary design to a visually prominent site in the T2/T3 precinct; and
- the proposed 4 to 5 star 430 room hotel that will benefit airport users, airline staff and other client groups on a highly accessible site at the entry to the T2/T3 precinct and readily accessible to both terminals.

The assessment identified potential or unavoidable construction and operational economic or community impacts of the proposed development. However, through various mitigation measures such as a dust management plan, a communications strategy and an urban design and landscape concept plan the residual impact was assessed as being from low to moderate.

9.2 Economic and employment impacts

A specialist investigation was undertaken to assess the economic and employment impacts of the proposed development and to nominate relevant mitigation measures for any identified adverse impacts. This investigation is reported in Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development Plan – Economic Impact Assessment[109]. Key findings of this investigation are presented below.

9.2.1 Existing local and regional economy

The economic and regional significance of the airport was addressed in detail in the Master Plan 2033 and in stakeholder comments on the draft Master Plan[110]. Key points of this significance of relevance to the proposed T2/T3 Ground Access Solutions and Hotel include:

- the airport is one of Australia's most important pieces of infrastructure. Directly and indirectly, it generates and facilitates[111]:
  - direct and indirect employment of 283,700 jobs, equivalent to 8 per cent of NSW employment, including 160,000 direct jobs – 28,000 of which are on airport;
  - direct and indirect economic contribution of $27.6 billion, equivalent to 6 per cent of the NSW economy and 2 per cent of the Australian economy;
  - direct and indirect contribution of household incomes of $132.2 billion – at $82,000 a year, the average full time equivalent (FTE) wage of an employee working in the airport precinct is 13 per cent higher than the NSW average for all employees; and

109 AECOM 2014e

110 Sydney Airport 2014, pp32 -40 and p29

111 Drawn from a 2013 study by Deloitte Access Economics Pty Ltd into the economic impact of Sydney Airport.

  - direct and indirect taxes including substantial income tax and GST revenues to the Australian Government, substantial payroll taxes to the NSW Government and annual contributions (in lieu of rates) to Botany Bay, Rockdale and Marrickville Councils.
- the continued growth of the airport is vital to achieving local and state based employment, tourism and development objectives; and
- Sydney Airport has invested more than $2 billion on facilities, capacity, and safety and security since July 2002 with flow-on benefits to the local and regional communities.

Sydney Airport is committed to meeting the needs of its customers and delivering a passenger experience that the community is proud of through:

- continued investment in facilities, capacity, safety and security;
- continuing to achieve high passenger service levels; and
- expanding the domestic and international route network for passengers and contributing to tourism and trade growth in Australia.

As noted in Section 5.2, the airport is identified as a specialised economic precinct in the draft Metro Strategy and by 2031 the airport is forecast to be the fifth largest employment centre in the Sydney metropolitan area with approximately 56,000 jobs. The proposed development is consistent with this economic context as it involves expenditure of approximately $295 million (excluding GST) during the construction period, which will generate additional employment during both the construction and operational periods as assessed below. This cost estimate is subject to review and includes all on-airport roadworks, access enhancements/facilities, the hotel and other elements of the project.

9.2.2 Impact assessment

The assessment of the economic impact of the proposed development was undertaken as a desktop analysis using economic multipliers derived from the most recent national input-output table (2009/10) prepared by the Australian Bureau of Statistics (2013).

Construction

The effect of expenditure during the construction period of the proposed development on the national economy will be essentially the same as on the NSW economy because it is unlikely that there would be any significant leakages of construction expenditure outside NSW. **Table 9.1** shows the calculated economic impacts for the NSW economy.

Based on an assumed peak on-site construction workforce of 500, direct employment supported by implementation of the proposed development is estimated to average 554 FTE positions a year for four years, giving a total of 2,216 annual FTE positions over the four year construction period. Flow-on employment is estimated to average 166 FTE positions a year for four years, giving a total of 664 annual FTE positions over the four year construction period.

Total employment supported by implementation of the proposed development is estimated to average 720 FTE positions a year for four years, giving a total of 2,880 annual FTE positions over the four year construction period.

Operation

The direct, indirect and total effects of annual expenditure to operate the proposed Ground Transport Interchange and 4 to 5 star hotel on output, value added, household income and employment in the NSW economy are shown in **Table 9.2**.

Table 9.1 Impacts of proposed capital expenditure on the NSW economy

	NSW economy		
Measure	**Direct**	**Indirect**	**Total[1]**
$ million (March 2014 prices)			
Output	449	197	687
Value added	150	89	239
Household income	82	50	132
Employment – number of FTE positions			
Annual average[2]	554	166	720
Total employment[3]	**2,216**	**664**	**2,880**

Notes

Source AECOM 2014e

1. Total may not add exactly due to rounding
2. Average number of FTE positions supported for four years
3. Total number of annual FTE positions supported over four years
4. Calculated using Type 1 multipliers

Table 9.2 Impacts of operational expenditure on the NSW economy

Input-output industry/measure	NSW economy		
	Direct	Indirect	Total[1]
$ million (February 2014 prices)			
Output	34	9	43
Value added	13	4	17
Household income	8	2	10
Employment – number of FTE positions			
Annual[2]	151	30	181

Notes

1 Total may not add exactly due to rounding

2 Number of annual FTE positions

Source: AECOM 2014e

Annual direct employment supported by operating the Ground Transport Interchange and the hotel is estimated to be 151 FTE positions, with indirect effects of 30 FTE positions, giving an estimated total of 181 FTE positions.

9.2.3 Mitigation measures

As the economic and employment impacts of the proposed development during both the construction and operational periods will be of significant benefit to the NSW economy, no mitigation measures are required or proposed.

9.3 Visual impacts

A specialist investigation was undertaken to assess the visual impacts of the proposed development and to nominate relevant mitigation measures for any identified adverse impacts. This investigation is reported in Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development Plan – Visual Impact Assessment[112]. Key findings of this investigation are presented below.

9.3.1 Existing visual environment of the project area

The basis for assessing the visual impacts of the proposed T2/T3 Ground Access Solutions and Hotel is a description of the existing visual environment and identification of potential viewing audiences.

Elements which contribute to the existing visual environment of the project area are aviation, industrial and commercial buildings, landscape and vegetated areas, lighting, and advertising structures and road signage. The potential viewing audiences comprise:

- airline passengers, meeters and farewellers, and other visitors to the airport;
- people who work at the airport;
- airline passengers (given the relative proximity of the project area to operational runways);
- occupants of commercial buildings located on and off the airport near the project area;
- residents of nearby areas in Mascot to the north and north-east of the project area; and
- commuters, motorists and other passersby.

Built elements

The built elements within and adjoining the project area are predominately made up of the road network within and beyond the airport boundary as well as a range of buildings interspersed with open/unbuilt on areas.

The road network within or adjacent to the project area, based on the historic Lauriston Park estate grid layout (see Section 8.8.1), sets the framework for the built environment. This network is a mix of two-way and one-way roads with the standard road signage and lighting but generally without on-street parking. Traffic movements, which vary substantially throughout the day and night, are the principal moving element in the local visual environment. There is some pedestrian and cyclist activity in, through and near the project area.

The arterial road network to the north of the project area and generally beyond the airport boundary – Qantas Drive, Joyce Drive, O'Riordan Street and Robey Street – is characterised by wider roads with more complex road furniture and signage and higher traffic volumes with higher proportions of heavy vehicles and pronounced peak period flows driven by commuter and business demand.

The buildings within or adjacent to the project area which accommodate airport and airport–related activities include hangars, the Qantas Freight facility, the multi-level P3 and Fifth Street car park, at-grade rental car storage, water tanks, an electrical substation, a telecommunications tower, and the Mercedes-Benz car showroom (see **Figures 9.1** and **9.2**). With the exception of the Mercedes-Benz car showroom, which reflects some architectural design, the

112 AECOM 2014f

Figure 9.1 Aircraft hangars (left) and GSE facility (right) viewed from the Component Cleaning Building (looking west)

Source AECOM 2140f

existing buildings are generally of functional design and rectangular floor plan and bulk, but with varying height, building materials, finishes and colours. These elements reflect the varying age of buildings from those recently completed such the P3 car park, which was completed in 2013, other recently completed buildings such as the Mercedes-Benz car showroom (about 2005) and the Qantas Freight facility (early 1990s) to older buildings such as Hangar 85 (mid 1940s), Hangar 58 (early 1940s) and the Ninth Street substation (1936).

Within the broader T2/T3 precinct, there are a number of low to medium rise multi-storey buildings and large-scale structures which contribute to the prevailing visual environment including:

- the extensive and largely horizontal T2 and T3 buildings, the two-level horseshoe roadway system serving both terminals and nearby public car parks and the associated canopies over the elevated departures levels located to the west;
- the large-scale Jet Base facilities to the north of T3; and
- the Airport Central office building and Stamford Plaza Hotel (see **Figure 9.2**), which form a large and integrated built form of 11 levels on land bounded by Qantas Drive, Robey Street and O'Riordan Street.

Landscaped and vegetated areas

The natural environment of the airport has been dramatically altered during its 102-year aviation history as extensively documented in the Sydney Airport Heritage Management Plan[113]. Very few areas of indigenous vegetation remain on or adjacent to the project area (see Section 8.7).

Most vegetation in the project area consists of small areas of planting for amenity purposes distributed across the area. Such landscaping typically comprises exotic and/or non-indigenous native trees in the form of street tree planting along roadways (see **Figure 9.3**). The primary area of landscaping in the project area is formal planting of cabbage fan palm trees (*Livistona australis*) and associated shrubs and ground cover at the main entrance to the T2/T3 precinct from Qantas Drive, Joyce Drive and O'Riordan Street (see **Figure 9.4**).

Additional vegetated areas are located:

- along the southern side of Qantas Drive and Joyce Drive;
- south of Hangar 20;
- north and east of the P3 car park;
- west of the Australian air Express building;
- on the northern side of Shiers Avenue and the eastern side of Sir Reginald Ansett Drive; and

113 Godden Mackay Logan 2009

Figure 9.2 Stamford Plaza Hotel and Mercedes-Benz car showroom from Ninth Street (looking north)

Source AECOM 2140f

Figure 9.3 Stand of spotted gum on Joyce Drive, east of Sir Reginald Ansett Drive (looking east)

Source AECOM 2140f

Figure 9.4 Gateway treatment at entrance to T2/T3 precinct from Sir Reginald Ansett Drive (looking north)

Source AECOM 2014f

- in Coleman Reserve, a small triangular-shaped public park bounded by Robey and Coleman Streets and the goods rail line, which is grassed with scattered mature trees.

Structures, advertising and signage

On the approach to and within the T2/T3 precinct, there are a number of gantries that accommodate standard road and information signage to guide motorists and pedestrians through the precinct and welcome visitors to the precinct (see **Figures 9.5** and **9.6**). In addition, there are several free-standing advertising structures (including more recently installed LED signs) in the road reserves, for example, on the northern side of Joyce Drive and Qantas Drive, and east and west of O'Riordan Street. Additionally on Qantas Drive and Joyce Drive, there are smaller rolling panel portrait advertising billboards. These advertising structures and signage contribute to the level of visual interest and complexity for drivers, passengers and pedestrians accessing the precinct.

Figure 9.5 Welcome to Sydney Domestic Airport gantry on Sir Reginald Ansett Drive (looking south)

Source AECOM 2014f

Figure 9.6 Road signage and free standing advertising structure on Joyce Drive (looking west)

Source AECOM 2014f

Lighting

Street lighting is provided to all roadways within and adjacent to the project area. In addition, lighting for security and occupational safety is provided to various activities within the project area such as the at-grade parking/car storage areas south of the Mercedes-Benz car showroom.

As all external lighting at the airport must comply with the Civil Aviation Safety Authority's (CASA) requirements set out in Manual of Standards, Part 139 Aerodromes, Chapter 9.21 Aerodrome Lighting – Lighting in the Vicinity of Aerodromes[114], the extent of upward light spill from areas near operational runways is limited.

Quality of the existing visual environment

As a result of the combination of all these elements, the existing visual environment of the project area can be described as quasi-industrial but well-presented and maintained, relatively visually complex and appropriate for airport-related uses. The existing visual environment is considered to have a functional appearance of medium to low visual quality.

9.3.2 Impact assessment

The visual impact has been assessed for the following viewing audiences:

Airline passengers, meeters and farewellers, and other visitors to the airport

Within the T2/T3 precinct, the experience for drivers and passengers is one of a built-up environment with a diverse and relatively complex visual character. The gateway treatment viewed by drivers and passengers as they enter the T2/T3 precinct from the intersection of Joyce Drive, Qantas Drive and O'Riordan Street consists of a designed gateway with formal plantings of cabbage fan palm trees, shrubs and ground cover plants and an overhead Sydney Airport welcome sign. As motorists progress to the domestic pick-up and drop-off areas at T2 and T3 and the multi-storey car parks, the existing visual experience is relatively homogenous with large, low to medium rise buildings with functional facade treatments and incidental areas of landscaping.

People who work at the airport

The visual experience for the many people who work in the T2/T3 precinct is similar to that described above but, for most airport-based workers, this experience occurs daily.

The visual character experienced by pedestrians in and near the project area is that of a quasi-industrial built environment with limited accessible street frontages, landscaping and pedestrian-friendly facilities and no original natural areas.

Cyclists

Access to the project area for cyclists is currently on main roads such as Joyce Drive, Qantas Drive, O'Riordan Street and Sir Reginald Ansett Drive with undercover bicycle racks located near Fifth Street adjacent to the existing public pick-up area providing secure undercover storage. The visual character experienced by cyclists is similar to that of pedestrians.

Airborne airline passengers

Given the proximity of the project area to operational runways (approximately 500 metres north of Runway 07/25's eastern end), the project area is visible to airline passengers in landing and departing aircraft. Currently, the project area would appear as part of the airport's overall visual environment in the T2/T3 precinct consisting of generally bulky built elements interspersed with areas used for open air at-grade vehicle storage such as the taxi holding area or rental car storage areas. The foreground views of the project area from operational aircraft is occupied by the open paved areas of taxiways and aprons fringed with airside accessible buildings such as hangars, terminals or freight handling facilities.

Occupants of commercial buildings located on and off the airport near the project area

The locations of commercial receivers on and off the airport considered for the visual assessment and their distances from the adjacent part of the project area are shown in **Table 9.3**.

Residents of nearby areas in Mascot to the north and north-east of the project area

The locations of residential receivers considered for the visual assessment and their distances from the adjacent part of the project area are shown in **Table 9.3**.

Commuters, motorists and other passers-by

Passing the northern boundary of the T2/T3 precinct along Qantas Drive and Joyce Drive, drivers and passengers see a built environment dominated by aviation-related and industrial/commercial uses including the Jet Base buildings constructed to the western edge of Qantas Drive to the north of Robey Street, the Port Botany to Sydenham goods rail line, advertising billboards and a range of commercial and industrial uses. These motorists may be through traffic, passenger and visitors to the T1 terminal or Port Botany and commuter traffic. There is some vegetation on the southern side of Qantas Drive and Joyce Drive, providing some visual contrast to the built elements. The experience for passing drivers is considered to be one of medium to low visual quality.

114 CASA 2003

Table 9.3 Residential and commercial receivers

Category	Receivers – location and description	Approximate distance from project area boundary (metres)
Residential	32 Ewan Street, north of the project area	200
	113 Robey Street, north-east of the project area	170
	103 Robey Street, north-east of the project area, east of Robey Street 1 receptor	180
	36 Baxter Street, north of the project area	415
Commercial	Stamford Plaza Hotel and conference centre and Airport Central office tower – both are located between O'Riordan Street, Robey Street and Qantas Drive	30
	Ibis Budget Hotel located at 5 Ross Smith Avenue, east of the project area	125
	Food service – Krispy Kreme, KFC and McDonalds, east of the project area	170
	Mercedes-Benz car showroom – within the north-eastern corner of the project area	within project area
Public open space	Coleman Reserve – small pocket park located between Robey and Coleman Streets, north of the goods rail line and north of the project area	35

Construction period visual impacts

Short term visual impacts associated with the construction of the proposed development would include the establishment of construction compounds and works areas with associated fencing, hoardings, localised generation of dust during earthworks, demolition of buildings and the presence of construction equipment including cranes, concrete trucks and other machinery.

During the demolition and construction phases of the proposed project (as described in Section 4.8), there would be temporary changes to the visual appearance of the project area as construction works progress, including the presence of construction equipment such as mobile and tower cranes.

Temporary flood lighting would be used at work sites within the project area to allow construction under limited natural lighting conditions. This may temporarily result in some localised light spill from the project area, which may be visible to commercial viewers, particularly in the Ibis Budget Hotel, the Stamford Plaza Hotel and some nearby residents.

Views experienced by drivers, passengers, pedestrians and cyclists would change noticeably during the construction and demolition phase of the project as sections of the project area would temporarily become construction sites. During construction, all compounds and work areas would be fenced with open mesh fencing or hoarding with Sydney Airport corporate design. There would also be localised changes to road signage and other way-finding material.

The visual impact to residential and commercial receivers would occur at different times depending on the location and stage of construction. For example, works on Qantas Drive (north side) during Project 5 may impact users of Coleman Reserve, Stamford Plaza and Airport Central and residents in Ewan Street most. However, works on Sir Reginald Ansett Drive during Project 5 may have a greater impact on guests of the Ibis Hotel and clients of the Mercedes-Benz car showroom than other viewers.

Operational visual impacts

The most noticeable change in visual character from the proposed development would occur as a result of the introduction of the ground plus 7 level Ground Transport Interchange, the adjacent ground plus 11 level hotel and the ground plus 9 level P1 East. While in keeping with the height of similar buildings in the surrounding area, the site is currently the location of lower scale, airport-related buildings and at-grade open areas used for vehicle storage.

Built elements

The photomontages shown in **Figures 9.7** to **9.11** provide an indicative representation of the proposed upgrades to Sir Reginald Ansett Drive, Shiers Avenue, Seventh Street and the Ground Transport Interchange and the pedestrian corridor with moving walkways through P1 East. The photomontages show how the key aspects of the Ground Access Solutions could appear within the visual setting and facilitate visual assessment. (The architectural treatment shown in these photomontages provides a representation of the likely building envelope.)

Figure 9.7 shows the proposed upgrade to Sir Reginald Ansett Drive looking southwards. The project would result in simplified way-finding as drivers enter the T2/T3

Figure 9.7 Indicative view of Sir Reginald Ansett Drive and Ross Smith Avenue intersection (looking south)

Source: Cox Richardson

Figure 9.8 Indicative view from Shiers Avenue of the Ground Transport Interchange exit to Seventh Street (looking north)

Source: Cox Richardson

Figure 9.9 Indicative view of bus and coach facility (looking north west)

Source: Cox Richardson

Figure 9.10 Indicative view of Seventh Street extension from Shiers Avenue (looking north)

Source: Cox Richardson

precinct on Sir Reginald Ansett Drive on a wider, one-way southwards road. The existing gantry would be upgraded to assist with this way-finding.

Figure 9.8 shows the proposed upgrade to Shiers Avenue looking west and the exit from the Ground Transport Interchange to the Seventh Street extension. The indicative facade treatment of the Ground Transport Interchange would increase the visual quality and interest for drivers and pedestrians passing through the facility.

Figure 9.9 shows the proposed bus and coach facility on the ground floor of the Ground Transport Interchange. The area of the Ground Transport Interchange would be of a functional yet contemporary design, and would have electronic information systems, a small retail outlet, additional way-finding signage and above-ground access for pedestrians.

There would be a substantial and positive change in the visual character of the intersection between the Seventh Street extension and Qantas Drive, from quasi-industrial in nature to medium-rise contemporary commercial in nature, as shown in **Figure 9.10**. The development of the Ground Transport Interchange and treatment to the eastern facade of Hangar 58 would also provide a positive change in the visual character of the project area. The proposed streetscape would include urban and transport elements to connect to the pedestrian and cycle network beyond the airport.

Figure 9.11 shows the proposed P1 East car park with the dedicated pedestrian corridor including moving walkways in both directions alongside Shiers Avenue. The indicative facade treatment of the P1 East car park and the visible pedestrian corridor would enhance the visual quality and interest for drivers and pedestrians passing the facility.

The proposed P1 East will have a significant clear height at ground level which with the addition of more expansive pedestrian circulation space, the provision of public toilets/washrooms and the introduction of cycling racks and end-of-trip facilities will provide the core elements for improved passenger experience and way-finding within and through the ground level spaces connecting terminals T2 and T3 with the variety of ground transport modes available throughout the wider precinct.

Given the proposed building volume of the Ground Transport Interchange and adjacent hotel, there would be some increase in the extent of overshadowing of nearby areas compared with the existing situation. This overshadowing would extend to the south-east, south and south-west of the proposed development and, in mid-winter, would partly extend over areas such as the taxi storage area and the P3 car park. The increase in overshadowing does not represent an adverse impact as these are not areas of public open space that large numbers of people use for extended periods.

The introduction of the Ground Transport Interchange and hotel to this part of the T2/T3 precinct will represent the continued development of the airport consistent with the development concept presented in the Master Plan 2033. The increase in development intensity (site coverage) and built form will result in a local environment that will be similar in scale to the nearby parking structures on-airport such as P3 and the Airport Central and Stamford Plaza Hotel buildings and the commercial development further north along O'Riordan and Bourke Streets near the Mascot rail station.

Other changes to the visual environment area would result the widening of various sections of roads within the project area. Overall, the introduction of these upgraded elements would result in a small increase in the extent of structures and paved areas.

Landscaped and vegetated areas

There is no substantial change proposed to the existing gateway treatment at the intersection of Joyce Drive and Sir Reginald Ansett Drive. The only change likely to occur would be a reconfiguration of the existing treatment on the south-eastern corner in response to the widening of the left turn slip lane.

One of the visual impacts of the proposed project would be the removal of some weeping fig trees to facilitate widening of Qantas Drive on its southern side and alterations to signage and way-finding information.

There would be some minor landscape gateway treatment of the widening on the south-western corner of the intersection between the Seventh Street extension and Joyce Drive to provide adequate sight lines for traffic.

Where possible, planting of vegetation at Sydney Airport is undertaken to improve the urban amenity and streetscape, taking into consideration the need to minimise attraction of bird species which may contribute to any increase in bird strike at the airport.

Signage

Signage and corporate identification would be placed on the proposed hotel, P1 East and the Ground Transport Interchange in specific locations such as along the parapet or vertically on the facades or on street lighting as banners. The signage would consist of corporate branding and signage and, in some cases, be illuminated as is the situation with other such signage on other facilities at the airport.

Changes in the visual experience for viewers

Views of the project area experienced by drivers, passengers, pedestrians and cyclists would change noticeably once construction of all works is complete. The nature and scale of the road network providing access to and exit from the T2/T3 precinct will increase in terms of

Table 9.4 Mitigation measures for potential visual impacts during construction

Potential impact	Viewer group(s)	Mitigation measures
Light spill from temporary flood lighting	Residential and commercial	Additional lighting, if required for construction activity, would be positioned to minimise the extent of light spill during night time, morning and evening periods, and directed away from residences and commercial receivers to the north and east.
Localised generation of dust during earthworks	Residential and commercial Drivers, pedestrians and cyclists	Erosion controls to be implemented as part of the construction environmental management plan to reduce and control dust generation for water and air quality reasons (see Sections 8.3.3 and 8.5.3).
Way-finding difficulties	Drivers, pedestrians and cyclists	Update road signage and other way-finding material as required to ensure that all access modes to, from and within the project area are appropriately signed. Accurate public information signs will be displayed while work is in progress and until works have been completed.
Appearance of construction compounds	Residential and commercial Drivers, pedestrians and cyclists	All construction compounds and work areas to be fenced with open mesh fencing or hoarding with Sydney Airport corporate design.
Appearance of works areas	Drivers, pedestrians and cyclists	Works sites will be left clean at the completion of a work day, and all construction equipment, materials and refuse will be stored in appropriate construction compounds.

number of lanes but the movement pattern for vehicles will be significantly improved compared with the current situation. The prominence of the proposed development provides an opportunity to enhance the visual experience through architecturally-designed facades and entry statements.

Access along Sir Reginald Ansett Drive will continue to be a mix of built form (the Mercedes-Benz car showroom), at-grade areas used for taxi storage, and incidental landscaped areas. The new exit from the precinct along the Seventh Street extension will be framed on both sides largely by built form in a manner not dissimilar to that elsewhere in the precinct along the horseshoe section of the road system. These changes are consistent with the evolving visual character of the airport.

Airline passengers would observe a more intensive and connected area of buildings adjacent to T2, T3 and existing car parks and a simplified but more expansive road network and building hierarchy.

9.3.3 Mitigation measures

Construction

Given that the changes to the local visual environment would be temporary in nature, the works would be staged and, with implementation of mitigation measures, the changes in the visual environment experienced by all viewer groups is considered acceptable.

Measures presented in **Table 9.4** would be implemented to mitigate temporary impacts that could otherwise cause some annoyance to viewer groups.

Operation

As part of detailed design, an urban design and landscape concept plan would be prepared to ensure that all elements of the proposed development will result in an integrated visual resolution consistent with the new gateway setting to the airport's T2/T3 precinct. As part of this plan, a signage strategy would be developed which provides a framework for the co-ordination of major directional and advertising signage for the precinct to assist way-finding for all users.

9.4 Impacts on local and regional communities

9.4.1 Existing local and regional communities and issues

Local residential communities

The project area is located within the boundary of the City of Botany Bay (which follows the original course of Cooks River across the airport).

The City of Botany Bay's population overall is considered to be growing and ageing with traditional family households with children already representing a minority share. In relation to the existing housing stock, the overall pattern indicates that Botany Bay has a mixed and changing housing stock with fewer detached dwellings, will require additional housing to meet future demands, and that there are limited housing choices in centres with the best transport, shopping and services[115].

115 SGS Economics and Planning 2009, pp33-35

Figure 9.11 Indicative view of P1 East and the pedestrian corridor (looking east)

Source: Cox Richardson

Table 9.5 Key demographic data for Mascot and City of Botany Bay

	Mascot		City of Botany Bay	
Demographic indicator	**No.**	**%**	**No.**	**%**
Suburb area (hectares)	862	31.9[1]	2,706	100.0
Population	10,180	25.9[1]	39,355	100.0
Private dwellings:				
Separate houses	1,770	43.4[2]	6,037	38.6[3]
Medium density[4]	625	15.3[2]	3,338	21.3[3]
High density[5]	1,669	40.9[2]	6,160	39.3[3]
Other	4	0.1[2]	86	0.6[3]
Not stated	10	0.2[2]	32	0.2[3]
Total private dwellings	4,078	26.1[1]	15,653	100.0[3]
Population density (persons/hectare)	11.81		15.64	
Average household size (persons)	2.48		2.51	

Notes

Source profile.id 2011 Census Community Profiles for City of Botany Bay Council

1 Mascot as percentage of City of Botany Bay

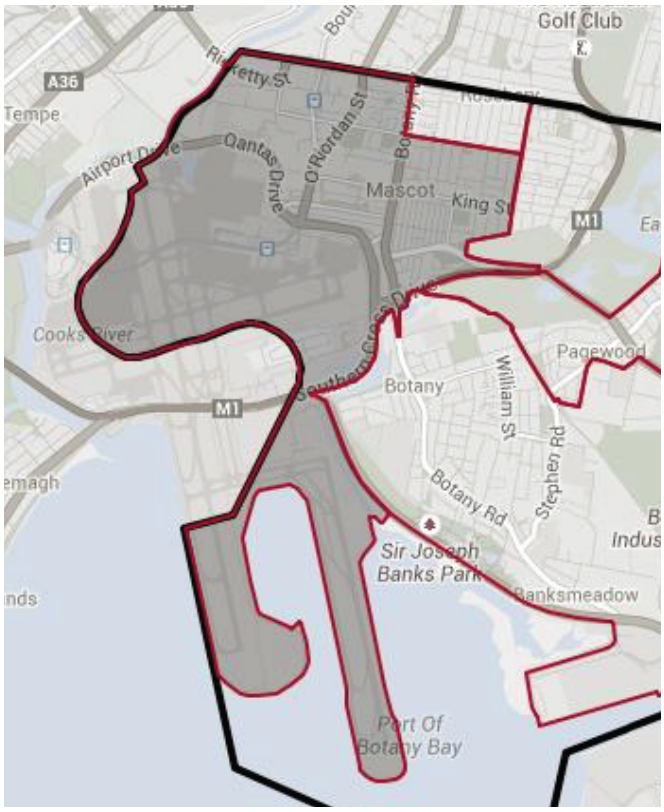
2 Percentage of private dwellings in Mascot

3 Percentage of private dwellings in City of Botany Bay

4 Semi-detached, row, terrace, townhouses and villa units, plus flats and apartments in blocks of 1 or 2 storeys, and flats attached to houses

5 Flats and apartments in 3 storeys and larger blocks

Figure 9.12 Mascot



Source profile.id 2011 Census Community Profiles for City of Botany Bay Council

Notes: Map not to scale

The closest residential development to the project area in zoned residential areas is located in parts of the suburb of Mascot to the east of O'Riordan Street and north of Baxter Road with some limited residential development in Ewan Street – an area which is zoned Business Development in the Botany Bay Local Environmental Plan 2013. A summary of some key demographic data from the 2011 census for the Mascot area (the smallest area available, see **Figure 9.12**) is presented in **Table 9.5**. These data indicate that population and dwelling density in Mascot is generally lower than in the City of Botany Bay overall.

The Botany Bay Planning Strategy 2031[116] provided the framework for growth for the next 25 years for the City of Botany Bay and assisted in the preparation of the Botany Bay Local Environmental Plan 2013. One of the strategic directions presented identifies the potential of Sydney Airport as a global gateway and the related demands to accommodate airport-related demands. The area south of Gardeners Road to the airport (Qantas Drive, Joyce Drive and General Holmes Drive) on either side of O'Riordan Street and Bourke Road was identified in this strategy for regeneration to encourage development of a major employment hub at Mascot rail station and to retain employment land to support growth of the airport.

The Mascot Station Urban Activation Precinct, announced by the NSW Premier in March 2013, is some 2km north of the airport and the project area. Urban activation precincts aim to deliver more homes in places with access to infrastructure, transport, services and jobs. However, planning for this precinct is on hold at this stage pending additional information on some of the details relating to the WestConnex project (see Section 5.3.1), which will affect planning for the area.

Regional communities

As Australia's primary international gateway and principal domestic aviation hub, the airport in general and the T2/T3 precinct in particular serves the air travel needs of local, regional, state and national communities. All these communities have an interest in efficient ground access links continuing to be available to and from the T2/T3 precinct consistent with forecast air passenger growth at the airport and demands on the RMS arterial road network.

116 SGS Economics and Planning 2009

Community issues

In addition to issues raised in stakeholder consultation on this proposed development as reported in Section 3.2 of this MDP, another insight into issues related to the planned development of the airport of interest to stakeholders was provided by analysis of issues raised in submissions on the recently approved Master Plan. Community issues relevant to the T2/T3 Ground Access Solutions and Hotel are discussed in the following sections.

Ground access issues

Increased traffic volumes and congestion within the T2/T3 landside area and on the wider road network in the vicinity of the airport is of concern to Sydney Airport, TfNSW, RMS, councils, road users, residents and other stakeholders. Roads on the perimeter of the airport not only provide access to the airport but also serve wider travel needs in the inner southern suburbs to the Sydney CBD as well as provide access to the M5 Motorway to the west, Port Botany to the south and, in the future, WestConnex (see Section 5.3).

The proposed development is planned to address known congestion points within the T2/T3 landside area, to improve the operation of the landside road network and to provide an enhanced pedestrian experience between the Ground Transport Interchange, car parks and the terminal buildings, T2 and T3. The proposed works are also intended to enhance ground transport operations for the benefit of airport visitors and staff and improve the operation of the T2/T3 precinct – the busiest domestic and regional aviation hub in Australia.

While preparing this MDP, Sydney Airport initially consulted a number of relevant stakeholders including TfNSW, RMS and the City of Botany Bay Council on the proposed development (see Chapter 3). These and other stakeholders were further consulted during the formal pdMDP public exhibition period.

Sydney Airport also consulted with a wide range of stakeholders while preparing the Master Plan 2033 including key Commonwealth, state and local government agencies with responsibility for ground transport issues – see Appendix G of the Master Plan[117]. Many key stakeholders made comments supporting the Five Year Ground Transport Plan and 20 year ground transport strategy, which now form part of the Master Plan 2033, relevant parts of which are included in this MDP[118].

A number of submissions received and comments made by the community and other stakeholders during the master plan consultation period indicated that access to the airport by those using active transport modes – that is, cyclists and pedestrians – needed to be safer and easier. The Master Plan 2033 clearly presents Sydney Airport's commitment to improving infrastructure to support access by such active transport modes. Consistent with the Master Plan 2033, the ground transport solutions proposed in this MDP include the provision of improved access to the airport from off-airport areas for pedestrians and cyclists (see Section 4.2), upgraded pedestrian arrangements within and through the T2/T3 landside area, enhanced end-of-trip bicycle facilities such as bicycle storage and lockers in the Ground Transport Interchange and redeveloped P1 East, and more effective links between the T2/T3 precinct and the off-airport bicycle network. Further, Sydney Airport is committed to working with local government and state agencies to connect existing on and off airport shared paths, to the paths to be developed as part of this MDP.

Aviation heritage

The impact of implementing the development concept presented in the Master Plan 2033 on existing heritage items on the airport was foreshadowed in both the Heritage Management Plan[119] and the Environment Strategy 2013–2018[120]. The Australian Heritage Council (AHC) encouraged Sydney Airport to explore prudent and feasible alternatives to protect items of heritage value, in particular those found to be of exceptional and high value. The AHC further recommended that the location of heritage items be identified in the Master Plan 2033 and carefully considered for retention in future planning.

As discussed in Section 8.8, a heritage impact assessment of the proposed development has been prepared which concluded that with regard to the heritage significance of the airport as a whole, the proposed development would have a moderate level of heritage impact.

Urban design of airport gateways

The importance of quality urban and architectural design (given the prominence of the airport in the eyes of international and local visitors) is acknowledged by Sydney Airport. This is particularly relevant for the design of the Ground Transport Interchange, adjacent hotel and redevelopment of P1 East to incorporate the above ground pedestrian link with assisted walkways.

As discussed in Section 9.3, the prominent location and built form of the proposed development will result in it being clearly visible to airport visitors and some nearby residents and commercial viewers. Sydney Airport recognises that the architectural design of the proposed buildings and ground level urban design will assist in integrating the new built form to the existing local visual environment of the project area and its setting in the T2/T3 precinct.

117 Sydney Airport 2014a

118 Sydney Airport 2014a, p29

119 Gooden Mackay Logan 2009

120 Sydney Airport 2014b, pp71-72

Development of on-airport hotels

Contemporary planning and development trends on and around major airports in Australia and internationally are increasingly including the provision of a range of hotel accommodation. The demand for such accommodation is generated by a number of airport-related factors such as flight arrivals and departures at times that warrant an overnight stay, unanticipated flight cancellations due to adverse weather or operational reasons, business and other conference reasons, and flight crew accommodation for transit, training or other reasons. As a result, there are a growing number of market segments that will require a range of hotel accommodation at various price points available in ready proximity to airport terminals. This increasing demand for services and facilities in close proximity to the airport was recognised in the Master Plan 2033.[121]

The potential development of a hotel in the T2/T3 precinct in the period to 2018 was identified in the Master Plan 2033.[122]

There is a current under-provision of accommodation capacity at Sydney Airport when benchmarked against comparable airports. As a consequence, Sydney Airport's proposal for a 4 to 5 star hotel with up to 430 rooms in the T2/T3 precinct is consistent with these market and travel trends and will complement the operation of other established and recently developed hotels both on the airport and in nearby areas of Mascot.

9.4.2 Impacts on local and regional communities

Construction

Adverse impacts of the construction of the proposed development identified in this MDP that may be experienced by members of the local community as well as visitors to the airport are noise and traffic delays.

Noise

Aspects of the proposed development, such as roadworks, are located about 35 metres from the nearest commercial and hotel developments beyond the airport boundary in Mascot. As assessed in Section 8.4, it is predicted that there may be some exceedances of the project-specific construction noise management levels (NMLs) for nearby residential receivers during daytime, evening and nighttime periods. It is also predicted that there would be some exceedances of project-specific NMLs for non-residential/commercial receivers both on the airport and beyond the airport boundary.

During detailed design of the proposed development and as part of the overall CEMP, a construction noise and vibration management plan would be prepared and include best practice mitigation measures.

Traffic delays

During the construction of the T2/T3 Ground Access Solutions and Hotel, a range of localised and short-lived disruptions on roads adjacent to construction sites are likely in the T2/T3 landside area. These disruptions, which occur with most road upgrading and building construction projects, may result in changed localised access arrangements and marginally longer travel times to and from the airport.

Preparation of a construction traffic management plan (CTMP) will be undertaken during detailed design to assess the impacts associated with construction activities and the impacts of construction-related vehicles.

The CTMP would seek to mitigate the impact on airport and non-airport traffic by defining appropriate extents of work, the timing and duration of construction activities, movements of construction vehicles, and making accommodation for parking and transport of site workers. The CTMP would also seek to stagger employee shift changes and arrange these changes so that they occur outside peak traffic periods.

In addition to the above mitigations, Sydney Airport will undertake comprehensive communications throughout the life of the construction works to inform stakeholders of the likely impacts of works.

Operation

Ground access solutions

When completed, the road improvements will facilitate timely and efficient access to the T2/T3 precinct and improve traffic conditions at intersections with Joyce Drive, O'Riordan Street and Robey Street. These works will also define and enhance the pedestrian experience for people accessing T2/T3 from the Ground Transport Interchange and the proposed adjacent hotel.

As assessed in this MDP, it is not expected that there would be any significant impact of the operation of the proposed road improvements and the Ground Transport Interchange on nearby residential communities.

Aviation heritage

The heritage impact assessment presented in Section 8.8 addresses the issues related to the loss of a number of buildings with heritage significance related to the development of the airport over many decades. The impact has been deemed moderate and mitigation measures are presented in Section 8.8.3.

121 Sydney Airport 2014a, p118

122 Sydney Airport 2014a, p119

Commercial facilities

As discussed in Section 9.2.2, the operation of the proposed Ground Transport Interchange and hotel will generate 151 FTE positions with a flow-on of 30 FTE positions. This increase in on-going jobs will contribute to the availability and diversity of employment within the local and regional areas.

The development of the proposed hotel responds to continuing demand for accommodation that provides direct and convenient access to Sydney Airport for the travelling public. The provision of a 4 to 5 star hotel near the T2/T3 precinct will be of particular benefit to airline passengers and airline crew as well as the wider tourism and commercial markets. The possibility of developing a hotel in the north-east precinct was presented in the Master Plan 2033 in the following manner:

> It is also possible that a hotel or hotels of approximately 300 to 500 rooms could be developed in the precinct.[123]

As assessed in other sections of this MDP, it is not expected that there would be any adverse impact of the operation of the proposed hotel on surrounding communities.

9.4.3 Mitigation measures

Construction

In advance of construction commencing, as discussed in Section 3.5, Sydney Airport will develop and start to implement a communications strategy to advise all relevant stakeholders and the travelling public of the proposed works. The intentions of this strategy will be to build awareness in advance of potential changed travel arrangements associated with the concurrent ground access improvements in both the T1 and T2/T3 precincts of the airport and the need to allow increased travel times to and from the airport.

Once construction commences on the T2/T3 Ground Access Solutions and Hotel, a range of media (including multi-lingual modes) will be used to provide information progressively about construction activities and the short-term implications for the travelling public.

As part of the communications strategy, Sydney Airport will notify the City of Botany Bay and residents and businesses in relevant areas of Mascot when construction work is about to commence and will provide details of a complaints handling process should residents have any concerns during the construction period.

Sydney Airport also has well-established communications and construction management protocols. These will help ensure that construction activities are managed in a manner that minimises adverse impacts on the amenity of local residential or business communities or on the operation of the airport itself, which is an essential infrastructure element at local, state and national level and a major employment location.

Operation

No mitigation measures are required. However, Sydney Airport will continue to consult with key stakeholders in relation to ground access to, from and around the airport and commercial development on airport land.

9.5 Outcomes of the economic and community impact assessments

The assessed economic and community impacts of the proposed development are summarised in **Table 9.6** for the construction and operational periods.

123 Sydney Airport 2014a, p119

Table 9.6 Economic and community impacts – construction and operation

Impacts – potential or unavoidable	Mitigation measures and further investigations	Level of residual impact
CONSTRUCTION		
Visual impacts		
Local visual impacts include: • the establishment of temporary construction compounds and works areas with associated fencing and hoardings. • localised generation of dust during earthworks. • demolition of buildings and the presence of construction equipment including cranes, concrete trucks and other machinery. • increased light spill from temporary floodlights for nighttime work. • changes to road signage and way-finding for motorists.	All construction compounds and work areas would be fenced with open mesh fencing or hoarding with Sydney Airport corporate design. Dust management measures as set out in the dust management plan. Duration of use and sighting of lighting to prevent or reduce visibility from on-airport and off-airport viewing audiences. Update road signage and other way-finding material as required to ensure that all access modes to, from and within the project area are appropriately signed.	Low
Local community impacts		
Traffic, noise and visual impacts as assessed in Chapter 7, Section 8.4 and Section 9.3 respectively.	Implementation of a communications plan to advise all relevant stakeholders and the travelling public of the proposed works.	Low to moderate
OPERATION		
Visual impacts		
Introduction of the ground plus 7 level Ground Transport Interchange and adjacent the ground plus 11 level hotel. While in keeping with the height of similar buildings in the surrounding area, the site is currently the location of lower scale, airport-related buildings and at grade open areas used for vehicle storage	Preparation of a T2/T3 precinct urban design and landscape concept plan to ensure that all elements of the proposed development will result in an attractive contemporary design consistent with the upgraded gateway setting to the airport's T2/T3 precinct. Development of a signage strategy to provide a framework for the co-ordination of major directional and advertising signage for the precinct to assist way-finding for all users.	Moderate


Arrivals
Rental Car
T3 Qantas Valet
Car Park 2
Public Pick-up

Chapter 10

Statutory Approvals and Policy Context

CHAPTER

10/STATUTORY APPROVALS AND POLICY CONTEXT

THIS MAJOR DEVELOPMENT PLAN IS CONSISTENT WITH ALL STATUTORY REQUIREMENTS. THIS CHAPTER DETAILS THOSE REQUIREMENTS.

10.1 Introduction

The relationship of the proposed T2/T3 Ground Access Solutions and Hotel to relevant statutory and policy requirements is discussed in this chapter, particularly the requirements of the *Airports Act 1996* and the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). Also addressed are the approval requirements if this proposal were to be considered under the NSW planning and development consent regime, particularly the requirements of the *Environmental Planning and Assessment Act 1979* (NSW) (the *EPA Act*).

10.2 Assessment and approval under the *Airports Act 1996*

10.2.1 Major Development Plan under the *Airports Act 1996*

In accordance with Division 4 of the *Airports Act 1996*, a major airport development must be undertaken only when a major development plan (MDP) has been approved by the Minister for Infrastructure and Regional Development (the Minister). Section 89(1) of the *Airports Act 1996*

specifies what constitutes a major airport development. The relevant development categories under Section 89 of the *Airports Act 1996* in relation to the proposed development are discussed below together with assessment about whether preparation of an MDP is required for the proposed development.

Development type

Section 89(1) of the *Airports Act 1996* specifies what development types constitute a 'major airport development'.

Road or vehicle access facility

Section 89(1)(h) and (j) relates to a new road or new vehicular access facility, as follows:

(h) constructing a new road or new vehicular access facility, where:

  (i) the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and

  (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed; or

(j) extending a road or vehicular access facility, where:

  (i) the extension significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and

  (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed.

The implementation of the proposed T2/T3 Ground Access Solutions will enhance operating conditions for existing and future ground traffic movements approaching, exiting and within the T2/T3 precinct. The proposed works, which include the implementation of a pair of one-way roads for Sir Reginald Ansett Drive (for inbound traffic) and the extension of Seventh Street (for outbound traffic), are designed to cater for forecast traffic movements to 2018 and beyond as set out in the Five Year Ground Transport Plan in the recently approved Sydney Airport Master Plan 2033 (the Master Plan 2033).

'The capacity of the airport to handle movements of passengers, freight or aircraft' is defined by the terminal arrangement and airfield layout incorporated in the Development Plan included as **Figure 4.2** in the Master Plan 2033[124]. The proposed T2/T3 ground access improvements are designed to cater for the forecast passenger increases and related requirement for increased capacity of ground access facilities.

As described in Chapter 4, the proposed Ground Access Solutions in the T2/T3 precinct, both separately and collectively, involve both 'constructing a new road or new vehicular access facility where none previously existed' as listed under Section 89(1)(h) – the Seventh Street extension - and 'extending a road or vehicular access facility' as listed under Section 89(1)(j) – widening of Qantas Drive and other roads – and will have a construction cost in excess of $20 million.

As a result, the components of these proposed works by themselves would constitute a major airport development and, as such, must not be carried out without an approved MDP.

New non-passenger terminal building

The non-passenger terminal building components of the proposed works – the Ground Transport Interchange and hotel with a combined total cost of construction in excess of $20 million – would both fall within Section 89(1)(e) which relates to:

(e) constructing a new building, where:

  (i) the building is not wholly or principally for use as a passenger terminal; and

  (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed.

As a result, these components of the proposed works would individually constitute a major airport development and, as such, must not be carried out without an approved MDP.

Conclusion

The intent of the proposal is, respectively, to provide increased ground access capacity and enhancements to the airport user experience to cater for the forecast growth in passenger numbers presented in the Master Plan 2033.

The proposed development requires the preparation and approval of an MDP pursuant to Section 90 of the *Airports Act 1996* under the two triggers in Sections 89(1)(h) and (j) for the ground access improvements and Section 89(1)(e) for the proposed hotel.

Environmental triggers

Section 89(1) of the *Airports Act 1996* includes the following environmental triggers for the preparation of an MDP:

(m) a development of a kind that is likely to have significant environmental or ecological impact; or

(n) a development which affects an area identified as environmentally significant in the environment strategy.

124 Sydney Airport 2014a, p64

As documented in Chapter 8, the construction and subsequent operation of the proposed development will not affect any areas identified as environmentally significant as identified in the Sydney Airport Environment Strategy 2013-2018 and is not likely to have a significant environmental or ecological impact.

As a result, the proposed development does not require the preparation and approval of an MDP pursuant to Section 90 of the *Airports Act 1996* under these two triggers.

Community impact trigger

Section 89(1) of the *Airports Act 1996* states that a major airport development includes:

(na) a development of a kind that is likely to have a significant impact on the local or regional community

Consultation with community stakeholders is important when identifying potentially significant community impacts. As described in Chapter 3, consultation with a range of stakeholders during the preparation of both the Master Plan 2033 and this MDP concerning the proposed development resulted in no major issues of concern being raised. Indeed, stakeholders (including airlines) expressed support for the anticipated reduction in traffic congestion and improvements in traffic flow to and from the T2/T3 precinct.

Based on the assessments presented in Chapters 7, 8 and 9, it is concluded that the proposed development will not cause any significant impact on the local or regional community. However, there will be some short term impacts on airport users, nearby residents and occupiers of nearby commercial buildings generated by construction of the proposed development. Such impacts can be mitigated to acceptable and/or appropriate levels.

As a result, the proposed development does not require the preparation and approval of an MDP pursuant to Section 90 of the *Airports Act 1996* under the local and regional community impact trigger.

Sensitive development trigger

Section 89(1) states that a major airport development includes:

(nb) a development in relation to which the Minister has given an approval under Section 89A

Section 89A relates to the prohibition of sensitive developments at federally leased airports without ministerial approval. Sensitive developments on federally leased airports are defined in Section 71A of the *Airports Act 1996* in the following terms:

(2) A sensitive development is the development of, or a redevelopment that increases the capacity of, any of the following:

(a) a residential dwelling;

(b) a community care plan;

(c) a pre-school;

(d) a primary, secondary, tertiary or other educational institution;

(e) a hospital.

As the proposed development does not include any sensitive developments as defined in the *Airports Act 1996*, preparation and approval of an MDP pursuant to Section 90 of the *Airports Act 1996* is not required under this trigger.

Concurrent or cumulative development trigger

Section 89(4) of the *Airports Act 1996* grants the Minister the power to determine that individual developments at a federally leased airport constitute a major airport development if such developments:

- will cost less than $20 million each;
- fall within several categories of major airport development listed under Section 89 (including extending a road or vehicular access); and
- are consecutive or concurrent projects.

The cumulative impacts of the construction of the proposed development with other approved and potentially concurrent projects on the airport are assessed in Section 8.9. The outcome of that assessment concludes that any potential cumulative impacts would not be significant and could be managed to appropriate levels.

As the proposed development requires the preparation of a MDP pursuant to other triggers under Section 89 (see above), it is considered unnecessary for the Minister to make a determination under Section 89(4) of the *Airports Act 1996*.

Conclusion

Based on the above assessment, it is considered that principal elements of the proposed T2/T3 Ground Access Solutions and Hotel individually and collectively constitute a major airport development. As a result, the proposed works must not be carried out without an approved MDP. As documented in Appendix A, the content of this MDP addresses all the relevant requirements of Section 91 of the *Airports Act 1996*.

10.2.2 Other approvals under the *Airports Act 1996*

Construction of the proposed development is also subject to:

- Sydney Airport's development application and consent application processes to satisfy the requirements of the *Airports Act 1996*, including stakeholder consultation, planning and infrastructure issues; and
- the submission of an application for a building permit to the Airport Building Controller (ABC) in accordance

with the Airports (Building Control) Regulations 1996 pursuant to the *Airports Act 1996*. The Sydney Airport consent application must comply with the conditions of the development approval.

10.3 Assessment under the *EPBC Act* and administrative guidelines

As the airport is situated on Commonwealth land, it is subject to the provisions of the *EPBC Act* with regard to environmental regulation and approval. Under the *EPBC Act*, an airport-related action requires approval of the federal Environment Minister if the action:

- has, will have, or is likely to have a significant impact on a matter of national environmental significance;
- is likely to have a significant environmental impact on Commonwealth land; or
- is not subject to one of the exceptions identified in the *EPBC Act*.

The determining authority for an assessment under the *EPBC Act* is the Environment Minister. The proposed action under consideration is the construction and operation of the T2/T3 Ground Access Solutions and Hotel on federally leased land managed by Sydney Airport.

10.3.1 Matters of national significance

The current matters of national environmental significance and the relationship of the proposed development to these matters are addressed in **Table 10.1**.

As a result, it is concluded that the proposed development documented and assessed in this MDP will not affect any matters of national environmental significance.

10.3.2 Significant effect on the environment on Commonwealth land

In assessing whether an action may have a significant effect on the environment on Commonwealth land, a proponent must have regard to the criteria set out in **Table 10.2**. Further relevant information can be found in Chapter 8.

Based on the assessment presented in this MDP, it is concluded that the proposed action will not have a significant impact on the environment of Commonwealth land.

10.3.3 Exceptions not requiring Environment Minister's approval

Under the *EPBC Act*, an action does not require approval from the Environment Minister if it meets one of the listed exceptions. These exceptions are listed in **Table 10.3** and the relationship of the proposed action to each one is discussed.

From this discussion, it can be clearly concluded that the proposed development is not subject to one of the exceptions identified in the *EPBC Act*.

10.4 Relationship of the proposed development to airport planning

The relationship of the proposed development to airport planning at Sydney Airport as required under r. 2.04(1) of the *Airports (Building Control) Regulation 1997* is presented in the following sections.

Table 10.1 Matters of national environmental significance and the relationship of the proposed development

World heritage matter	Relationship of proposed development
World heritage properties	Not applicable – no world heritage properties on the airport or nearby
National heritage places	Not applicable – no national heritage properties on the airport or nearby
Wetlands of international importance listed under the Ramsar Convention	Towra Point Conservation Area is so listed but the proposed development would not have a significant impact on this area which is some 8km from the project area
Listed threatened species and ecological communities	None affected (see Section 8.7)
Migratory species protected under international agreements	None affected (see Section 8.7);
Commonwealth marine areas	Not applicable
The Great Barrier Reef Marine Park	Not applicable
Nuclear actions (including uranium mines)	Not applicable.

10.4.1 Consistency with the Sydney Airport Master Plan 2033

Sydney Airport Master Plan 2033

The Sydney Airport Master Plan 2033 (Master Plan 2033) was approved by the Deputy Prime Minister and Minister for Infrastructure and Regional Development on 17 February 2014.

In the Master Plan 2033, the proposed T2/T3 precinct ground access improvements were foreshadowed as follows:

> In this Master Plan a proposed new one-way road system through the T2/T3 precinct is designed to increase the entry and exit capacity of the area and significantly improve traffic flows in and around the precinct (see **Figure 7.4**).

Table 10.2 Considerations under the *EPBC Act* and administrative guidelines[125]

Matters to be considered	Consideration
Environmental context	
(a) What are the components of the action?	The action will involve the construction and the operation in the T2/T3 precinct of the airport of: • ground access works including new roadways, road widening and road realignment; • expansion of P3 carpark and the redevelopment of P1 East carpark to facilitate the proposed pedestrian corridor with assisted walkways through the new development and additional parking for 1,500 vehicles; • a ground plus 7 level Ground Transport Interchange including a ground level bus facility and multi-modal parking for approximately 4,000 vehicles; and • a 4 to 5 star ground plus 11 level hotel with approximately 430 rooms.
(b) Which components or features of the environment are likely to be impacted?	The airport site, the local road network and the local visual environment in the T2/T3 precinct and nearby residential and non-residential areas beyond the airport boundary may be impacted by the construction and subsequent operation of the works documented and assessed in this MDP.
(c) Is the environment which is likely to be impacted, or are elements of it, sensitive or vulnerable to impacts?	The occupants of two hotels (one on-airport and one off-airport) close to parts of the project area as well as some residents in the suburb of Mascot to the north, north-east and east of the project area may be subject to some noise impacts during the construction period (see Section 8.4). Receiving waterbodies downstream of the project area including Alexandra Canal, Cooks River, Mill Stream and, ultimately, Botany Bay may be sensitive or vulnerable to impacts on water quality if construction activities are not managed appropriately.
(d) What is the history, current use and condition of the environment which is likely to be impacted?	The historical use of the project area for the proposed development has focused on roads, surface parking areas, air freight and other airport support activities for more than 80 years. The current use of the project area is in line with its historical use. As described in Chapter 6 and confirmed in the environmental assessment presented in Chapter 8, the project area is considered suitable for the construction and subsequent operation of the proposed development documented and assessed in this MDP.
Potential impacts	
(a) What are the components of the action?	As described in Chapter 4, the proposed development involves the construction and operation in the T2/T3 precinct of the airport: • ground access works including new roadways, road widening and road realignment; • expansion of P3 carpark and the redevelopment of P1 East carpark to facilitate the proposed pedestrian corridor with assisted walkways through the new development and additional parking for 1,500 vehicles; • a Ground Transport Interchange including a ground level bus facility and multi-modal parking on ground plus 7 levels for approximately 4,000 vehicles, and • a 4 to 5 star ground plus 11 level hotel with approximately 430 rooms.
(b) What are the predicted adverse impacts associated with the action including indirect consequences?	The construction and operation of the proposed T2/T3 Ground Access Solutions and Hotel will result in both positive and negative impacts. **Construction period** The **unavoidable** impacts of the construction of the proposed T2/T3 Ground Access Solutions and Hotel are assessed to be: • Traffic – the generation of additional traffic within and beyond the airport and changes to and short-lived delays in traffic movements within the T2/T3 precinct; • Ecology – loss of 30 native species (planted for amenity reasons) and potential habitat for the 'vulnerable' grey-headed flying fox species; and • Heritage – loss of four heritage items and a portion of two other heritage items within the footprint of the proposed development.

125 DEH Policy Statement *EPBC Act* Policy Statement 1.2 Significant Impact Guidelines - Actions on, or Impacting upon Commonwealth Land and Actions by Commonwealth Agencies, May 2006.

Matters to be considered	Consideration
	The **potential** impacts of the construction of the proposed development are identified as: • Soil and groundwater contamination – contamination from existing fill and building materials, construction activities and exposure of acid sulphate soils; • Surface water quality – pollution of receiving waters from erosion and sedimentation and polluted groundwater during construction activities; • Ground noise – exceedances of noise management levels at residences and non-residential properties; • Air quality - potential for generation of dust during initial site works; • Hazard and risk – incidents during construction of the quick turnaround (QTA) rental car refuelling facility within the ground level of the Ground Transport Interchange; • Ecology – impacts on retained vegetation on or near the project area; and • Visual impacts – changes in views from the local environment and way-finding for airport users. **Operational period** Once operational, the **benefits** of the proposed development will include: • improvements to traffic circulation within and beyond the T2/T3 precinct to provide increased capacity in line with forecast passenger increases; • improved active transport facilities promoting the use of active transport modes to and from the airport; • increased capacity to serve public buses and promote a modal shift to public transport; and • localised changes to and improvements to the visual environment at the two principal intersections that will form the entrance and exit gateways to and from the T2/T3 precinct. The **unavoidable** impacts during the operation of the proposed development are assessed to be: • Visual impacts – introduction of ground plus 7 level Ground Transport Interchange and ground plus 11 level hotel into an area of lower rise airport-related buildings. The **potential** impacts of the operation of the proposed development are identified as: • Soil and groundwater contamination – contaminated run-off and spillages and leakages • Surface water quality – pollution of receiving waters by stormwater run-off. • Hazard and risk – incidents during operation of the QTA refuelling facility within the ground level of the Ground Transport Interchange.
(c) How severe are the potential impacts?	The potential impacts will be largely confined to the construction period totalling 42 months. Whether identified as unavoidable or potential, all impacts are assessed to be **low to moderate**. All potential impacts would be able to be appropriately mitigated.
Impact avoidance and mitigation	
Will any measures to avoid or mitigate impacts ensure with a high degree of certainty that impacts are not significant?	The planning for and concept design of the proposed development has endeavoured to design out adverse impacts. During detailed design, where possible, refinements will be made to the concept design to further reduce potential adverse impacts and to incorporate environmentally beneficial design features. For residual potential impacts, mitigation of all construction impacts will be as set out in the construction environmental management plan. Further information on heritage impact avoidance can be found in section 8.8.3.
Are the impacts significant?	
Is the action likely to have a significant impact on the environment?	The proposal is unlikely to have any significant impact on the environment or on the local or regional community.

In combination with work directly outside the airport boundary, this one-way road system would provide a superior solution to handle airport traffic as well as providing benefits to Port Botany and general commuter traffic.

In addition, to facilitate the modal shift to public transport, Sydney Airport is proposing to construct a bus and multi-purpose parking facility located between Ninth Street and the Robey Street extension. This facility of up to 3,000 spaces would cater for a range of uses including car rental, valet and limousine storage and general parking.[126] It would also allow for additional and rerouted public buses to easily access and exit the T2/T3 precinct. The proposed facility is planned to be supported by new pedestrian circulation corridors, orientation spaces, way-finding signage and flight information displays.

126 The 20 year context for provision of additional parking is set by the Master Plan 2033 as follows:
To meet the forecast demand by 2033, total car parking spaces in the precinct are likely to grow by an additional 6,500 spaces over and above the 8,500 proposed as part of the Five Year Ground Transport Plan. [Sydney Airport 2014a, p96]

Table 10.3 Relationship of proposed action to exceptions under the *EPBC Act*

Exception	Relationship of proposed action
The action is approved under, and taken in accordance with, a state management plan that is accredited by the Commonwealth for the purposes of a bilateral agreement (s46 of the Act), or	The proposed action is not approved under, and taken in accordance with, a state management plan that is accredited by the Commonwealth for the purposes of a bilateral agreement.
The action is approved under, and taken in accordance with, a Commonwealth management plan that is accredited by the Environment Minister for the purposes of a ministerial declaration (see s33 of the Act), or	The proposed action is not approved under, and taken in accordance with, a Commonwealth management plan that is accredited by the Environment Minister for the purposes of a ministerial declaration.
The action is a forestry operation taken in a regional forest agreement region (Part 4, Division 2 of the Act), or	The proposed action is not a forestry operation taken in a regional forest agreement region.
The action is taken in the Great Barrier Reef Marine Park and is authorised by certain instruments issued under the Great Barrier *Marine Park Act 1975* (s43 of the Act), or	The proposed action is located at Sydney Airport.
The action has been authorised under a law of the Commonwealth, a state or a self-governing territory prior to the commencement of the Act (s43A of the Act);	The proposed action has not been authorised prior to the commencement of the *EPBC Act*.
The action is a continuation of an action with prior authorisation under s43A of the Act (s43B of the Act);	The proposed action is not a continuation of an action with authorisation prior to the commencement of the *EPBC Act*.
The action has been authorised by a government decision on which the Minister's advice has been sought (s160 of the Act).	The proposed action has not been authorised by a government decision on which the Minister's advice has been sought.
Other exceptions:	
An approval is not required for an action if: • the action was authorised by the Commonwealth, a state or a territory prior to the *EPBC Act* commencing (16 July 2000), and	The proposed action was not authorised by the Commonwealth, a state or a territory prior to the commencement of the *EPBC Act* or did not require any further authorisation.
• at the time the *EPBC Act* commences, no further authorisation is required to allow the action to be lawfully taken (s43A of the Act).	
An approval is not required for an action that is a lawful continuation of a use of land, sea or seabed that was occurring immediately before the commencement of the Act (s43B of the Act).	The proposed action is not a lawful continuation of a use of land, sea or seabed that was occurring immediately before the commencement of the *EPBC Act*.

> The proposed road works/changes include a southern extension of Robey Street from Qantas Drive through the current Jet Base to Shiers Avenue to create a new dedicated five-lane exit road from the precinct. Traffic would enter T2/T3 via an expanded entry on Sir Reginald Ansett Drive and move one way through the precinct and exit via the Robey Street extension onto Qantas Drive or continue north on Robey Street and then O'Riordan Street. The existing signalised control of Ross Smith Avenue/Sir Reginald Ansett Drive is planned to be optimised to ensure effective traffic flow of the Sir Reginald Ansett Drive entry point[127].

In the Master Plan 2033, the proposed development of commercial facilities (car park and hotel) in the T2/T3 precinct were foreshadowed as follows:

> Over the long term, planning provision has been made for meeting a variety of commercial demands including offices, hotels, retail, service facilities and advertising signage in this area. The precinct can accommodate demand for up to a total of 120,000 square metres of commercial floor space (excluding the T2 and T3 terminals), which will comprise both the existing precinct built form and proposed future additions …
>
> **In the period to 2018**, a new Seventh Street multi-storey car park and new public transport facility with access from an extended Robey Street may be required as proposed ground transport improvements ... are progressed. It is also possible that a hotel or hotels of approximately 300 to 500 rooms could be developed in the precinct.[128]

In terms of land use planning under the Master Plan 2033, the subject land for the proposed development is zoned AD2 – Airport Terminal and Support Services. Under this zone, the proposed uses for roads, car parks, passenger transport facilities and hotels are all permissible uses with consent.

127 Sydney Airport 2014a, p93

128 Sydney Airport 2014a, pp118-119

As part of concept design and further investigations undertaken during the preparation of this MDP, a small number of refinements have been made to the concept presented in Master Plan 2033. These refinements are considered to be insignificant. Therefore, the proposed development is considered to be consistent with the approved Master Plan 2033.

10.4.2 Consistency with any approved MDP

To date, three MDPs have been approved for developments at Sydney Airport:

- **Commercial office development** on a site at the northern section of the landside area of Terminal 1. This MDP was approved by the Minister in May 2002. The first of the two approved office buildings is completed and occupied by the Customs and Border Protection Service;
- **Multi-storey car parking and commercial development** located in the landside area adjacent to T1. This MDP was approved by the Minister in April 2005. Two multi-storey car parking modules, the commercial office development (known as the Central Terrace Building) and the Rydges Hotel have all been completed; and
- **Runway end safety enhancement** at the western end of Runway 07/25. This MDP was approved by the Minister on 15 August 2008 and construction of this runway element was completed in 2009.

The proposed development addressed in this MDP will result in improved ground access arrangements in the T2/T3 precinct, along with the development of a Ground Transport Interchange and a hotel. The T2/T3 precinct is at least 2km from the location of the two major airport developments constructed in the landside area of the T1 precinct in accordance with the approved MDPs. As a result, the proposed development assessed in this MDP is considered to be fully consistent with the developments that have been constructed and operated pursuant to first two MDPs noted above.

In addition, as the proposed development is in the T2/T3 precinct, it is fully consistent with the development addressed in the approved MDP for the runway end safety enhancement located airside at the western end of Runway 07/25 at a distance of some 2.5km from the project area.

10.4.3 Consistency with the Sydney Airport Environment Strategy 2013-2018

The proposed development is consistent with the Sydney Airport Environment Strategy 2013-2018 which forms part of the Master Plan 2033 approved by the Deputy Prime Minister and Minister for Infrastructure and Regional Development on 17 February 2014.

In regard to Section 89(1)(m) of the *Airports Act 1996*, the proposal is not assessed to be a development of a kind that is likely to have significant environmental or ecological impact.

In regard to Section 89(1)(n) of the *Airports Act 1996*, the proposal is not located close to an area identified as environmentally significant in the Sydney Airport Environment Strategy 2013-2018.

The design, construction and operation of the proposed development will be informed by and consistent with the management plans set out in the Sydney Airport Environment Strategy 2013-2018.

10.4.4 Consistency with Sydney Airport's planning objectives

The proposed development is consistent with Sydney Airport's planning objectives for the airport site as set out in the Master Plan 2033 (see Section 10.4.1).

10.5 Consistency with prevailing state planning policies and controls

Sydney Airport lies partly within the boundaries of Rockdale, Botany Bay and Marrickville councils but is not subject to planning and development controls under NSW legislation administered by the NSW and local governments. The project area for the proposed development is fully within the City of Botany Bay local government area.

10.5.1 Consistency with Botany Bay Local Environmental Plan 2013

Under the Botany Bay Local Environmental Plan 2013, the project area is located within in the SP2 – Infrastructure (Airport) zone, which permits development for airport purposes. Development that is ordinarily ancillary to airport purposes is also permissible with consent in this zone. Arguably, such development would include road, car park, hotel or motel accommodation or transport depot as defined in the Botany Bay Local Environmental Plan 2013 and which relate to the principal elements of the proposed development.

For planning purposes, r. 5.02 of the *Airport Regulations 1997* requires that applications for landside development proposals at federally leased airports be consistent with and provide equivalent documentation to that required under prevailing state land use planning controls and development consent processes. In NSW, the relevant legislation is the *Environmental Planning and Assessment Act 1979* (*EP&A Act*) and its related regulations which enables the planning and development consent process.

The objectives of the SP2 – Infrastructure (Airport) Zone are:

- To provide for infrastructure and related uses; and
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

A comparison of the planning requirements for development of the T2/T3 Ground Access Solutions and Hotel (as described in Chapter 4) within the City of Botany Bay Council area with planning requirements under the *Airports Act 1996* is provided in **Table 10.4**.

10.5.2 NSW State environmental planning policies

The following state environmental planning policies (SEPPs) are considered directly relevant to the proposed development:

State Environmental Planning Policy 1 – Development Standards;

State Environmental Planning Policy 55 – Remediation of Land; and

State Environmental Planning Policy Infrastructure (2007).

Consistency with these SEPPs is provided in **Table 10.5**.

Sydney Airport considers that the documentation presented in the proposed T2/T3 Ground Access Solutions and Hotel MDP and consultation with stakeholders would be consistent with and provide equivalent documentation to the applicable requirements under the NSW planning and development consent process as administered by the Department of Planning, the City of Botany Bay Council and other relevant agencies. An outline of other approvals required for the proposed development at Sydney Airport is provided in Section 10.2.2.

Table 10.4 Comparison of planning requirements for the T2/T3 Ground Access Solutions and Hotel

Botany Bay planning requirements	***Airport Act 1996* planning requirements**
Compliance with the zoning and development control provisions of Botany Bay Local Environmental Plan 2013, in particular, suitable zoning of the site, namely SP2 – infrastructure (Airport).	Under both the Master Plan 2033 and the Environment Strategy 2013-2018, the project area is included fully within in the AD2 – Airport Terminal and Support Services on the Land Use Zoning Plan[129]
Within the SP2 zone, a road, car park, hotel or motel accommodation, or transport depot would be permitted with consent consistent with the following provision of this zone: The purpose shown on the land zoning map, including any development that is ordinarily incidental or ancillary to development for that purpose	Under the AD2 – Airport Terminal and Support Services zone, road, car park, passenger transport facility and hotel are all permissible uses with consent.
Compliance with relevant provisions of Botany Bay Development Control Plan 2011 such as: • Off-street car parking • Access • Energy efficiency • Building design and construction • DCP No. 24 – Notification of Development Applications. • DCP No. 32 Landscaping • DCP No. 34 Contaminated Land • DCP No. 37 Heritage Conservation • DCP No. 41 Advertising	Consistency with relevant management plans developed and implemented as part of Sydney Airport Environment Strategy 2013-2018 and the project-specific environmental management plan.

129 Figure 12.1 in the Master Plan 2033

Table 10.4 Comparison of planning requirements for the T2/T3 Ground Access Solutions and Hotel

continued

Botany Bay planning requirements	*Airport Act 1996* planning requirements
Submission of a development application (DA) accompanied by a statement of environmental effects to council. Documentation to be submitted with the DA includes that specified in the City of Botany Bay Development Application Guide (July 2012) including completion of a development application and preparation of a statement of environmental effects.	• Assessment of whether the proposal will have a significant impact on the environment under the *EPBC Act* to determine whether the proposal should be referred to the Department of the Environment; • Preparation of an MDP; • Completion of Sydney Airport's development consent application processes; and • An application to the Airport Building Controller (ABC) for a building permit.
Integrated development special requirements: Integrated development is development (not being complying development) that, in order for it to be carried out, requires development consent and one of the below approvals in terms of the *Roads Act 1993* (NSW) – Section 138 which requires consent to: (a) erect a structure or carry out a work in, on or over a public road, or (b) dig up or disturb the surface of a public road, or (c) remove or interfere with a structure, work or tree on a public road, or (d) pump water into a public road from any land adjoining the road, or (e) connect a road (whether public or private) to a classified road	Sydney Airport has and will continue to consult with TfNSW and RMS in relation to any requirements for work on or within RMS assets.
Concurrence and referral obligations are found in the *EPA Act*, state environmental planning policies and local environmental plans and are most often required where the consent authority requires more technical or specialist advice from a particular authority.	Sydney Airport will consult with relevant authorities.
Notification of a development application would be for a minimum of 14 days (or a longer period based on the wider effects of the development proposal and the public interest) by means including a notice on site, to nearby property owners, and possibly more widely by means of an advertisement in the local newspaper.	The pdMDP is required to be made available for public comment for 60 business days. Consultation has been undertaken with relevant stakeholders and issues addressed in this MDP (see Chapter 3). In addition, the recent public comment period for the approved Master Plan 2033 has provided an up to date strategic context for the proposed development.
Referral to relevant state agencies such as the NSW Department of Environment and Climate Change in relation to a proposal in proximity to an area of ecological significance. Compliance with the requirements of any applicable s94 contributions plans such as S94 Contributions Plan 2000	Consultation has been undertaken with relevant stakeholders and issues addressed in this MDP (see Chapter 3). Project design to meet all appropriate design requirements and all relevant impacts to be addressed by appropriate management plans.

Table 10.5 Consistency of the proposed development with relevant SEPPs

SEPP provisions	*Airport Act 1996* planning requirements
SEPP 1 – Development Standards	The purpose of SEPP 1 is to provide more flexibility to development standards. The SEPP allows an authority to approve a non-complying development proposal provided that they can show that the set standard is unreasonable or unnecessary. Sydney Airport has a comprehensive development assessment process pursuant to the aims and objectives of the *Airports Act 1996*.
SEPP 55 – Remediation of Land	The objectives of SEPP 55 include the remediation of contaminated land for the purpose of reducing the risk to human health or another aspect of the environment. Under the SEPP, a consent authority must not grant consent to a development unless it has considered whether the land is contaminated and whether it is suitable, or can be made suitable, for the proposed use.
SEPP Infrastructure	The Master Plan 2033 is consistent with the provisions of the infrastructure SEPP insofar as the Master Plan requires both an environmental assessment and accountability regime in requiring consent for all works undertaken on the airport site.

Table 10.6 Obligations under *Airports Regulations* 1997, Clause 5.04

Clause 5.04	Relevant section of the MDP
For Subsection 91 (3) of the Act, a major development plan must address the obligations of the airport-lessee company as sub-lessor under any sub-lease of the airport site concerned, and the rights of the sub-lessee under any such sub-lease, including:	Neither the obligations of Sydney Airport Corporation Limited as sub-lessor, nor the rights of any sub-lessee, under any sub-lease of the airport site concerned are affected by the MDP.
(a) any obligation that has passed to the relevant airport lessee company under Subsection 22 (2) of the Act or Subsection 26 (2) of the Transitional Act; or	There are no such obligations in relation to the MDP.
(b) any interest to which the relevant airport lease is subject under Subsection 22 (3) of the Act, or Subsection 26 (3) of the Transitional Act.	There are no such interests in relation to the MDP.

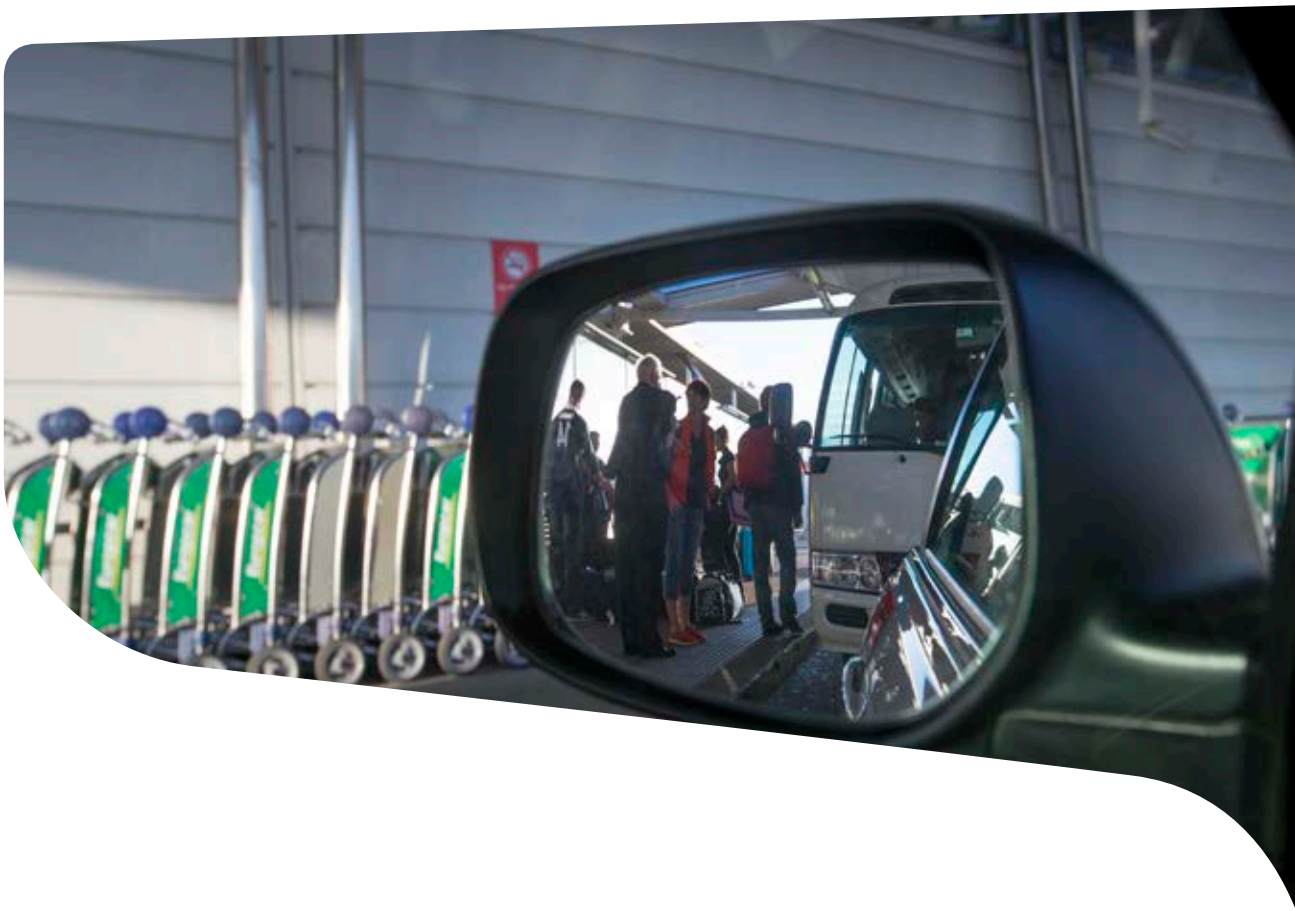
10.6 Consistency with the airport head lease and residual obligations

10.6.1 Consistency with the airport lease

The proposed development is consistent with the airport lease for Sydney (Kingsford Smith) Airport between the Commonwealth of Australia and Sydney Airports Corporation Limited (the original name of the airport lessee company [ALC]).

10.6.2 Consistency with *Airports Regulation 1997*, Clause 5.04

Section 91(3) of the *Airports Act 1996* and r. 5.04 of the *Airports Regulations 1997* require a MDP to address the obligations of the ALC as sub-lessor under any sub-lease of the airport site concerned and the rights of the sub-lessee under any such sub-lease. **Table 10.6** presents information on the consistency of the MDP with this requirement.



APPENDIX A
CONSISTENCY OF THE MDP WITH SECTION 91 OF THE *AIRPORTS ACT 1996*

Section 91 requirement		Relevant section(s) of this MDP
(1A)	The purpose of a major development plan in relation to an airport is to establish the details of a major airport development that:	
	(a) relates to the airport; and	Chapters 1 and 2
	(b) is consistent with the airport lease for the airport and the final Master Plan for the airport.	Sections 11.7 (lease) and 11.4.1 (Master Plan 2033)
(1)	A major development plan, or a draft of such a plan, must set out:	
	(a) the airport lessee company's objectives for the development; and	Section 1.2
	(b) the airport lessee company's assessment of the extent to which the future needs of civil aviation users of the airport, and other users of the airport, will be met by the development; and	Chapters 1 and 2
	(c) a detailed outline of the development; and	Chapter 4
	(ca) whether or not the development is consistent with the airport lease for the airport; and	Section 11.7
	(d) if a final Master Plan for the airport is in force, whether or not the development ix`s consistent with the final Master Plan; and	Section 11.4.1
	(e) if the development could affect noise exposure levels at the airport, the effect that the development would be likely to have on those levels; and	Not applicable
	(ea) if the development could affect flight paths at the airport, the effect that the development would be likely to have on those flight paths; and	Not applicable
	(f) the airport lessee company's plans developed following consultations with the airlines that use the airport, local government bodies in the vicinity of the airport and – if the airport is a joint user airport – the Defence Department for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant Australian noise exposure forecast (ANEF) levels; and	Not applicable
	(g) an outline of the approvals that the airport lessee company, or any other person, has sought, is seeking, or proposes to seek under Division 5 or Part 12 in respect of elements of the development; and	Division 5 – Chapters 1 and 2 Part 12 – Not applicable
	(ga) the likely effect of the proposed developments that are set out in the major development plan, or the draft of the major development plan, on:	
	(i) traffic flows at the airport and surrounding the airport; and	Chapter 7
	(ii) employment levels at the airport; and	Section 9.1
	(iii) the local and regional economy and community, including an analysis of how the proposed developments fit within the local planning schemes for commercial and retail development in the adjacent area; and	Section 9.2 and Section11.5.1
	(h) the airport lessee company's assessment of the environmental impacts that might reasonably be expected to be associated with the development; and	Chapter 8
	(j) the airport lessee company's plans for dealing with the environmental impacts mentioned in paragraph (h) (including plans for ameliorating or preventing environmental impacts); and	Chapter 8

Section 91 requirement		Relevant section(s) of this MDP
(1) *continued*	(k) if the plan relates to a sensitive development, the exceptional circumstances that the airport lessee company claims will justify the development of the sensitive development at the airport; and (l) such other matters (if any) as are specified in the regulations.	Not applicable Section 11.4
(2)	Paragraphs (1)(a) to (k) (inclusive) do not, by implication, limit paragraph (1)(l).	Noted
(3)	The regulations may provide that, in specifying a particular objective, assessment, outline or other matter covered by Subsection (1), a major development plan, or a draft of such a plan, must address such things as are specified in the regulations.	Noted
(4)	In specifying a particular objective or proposal covered by paragraph (1)(a), (c) or (ga), a major development plan, or a draft of a major development plan, must address: (a) the extent (if any) of consistency with planning schemes in force under a law of the state in which the airport is located; and (b) if the major development plan is not consistent with those planning schemes, the justification for the inconsistencies.	 Section 11.4 Not applicable
(5)	Subsection (4) does not, by implication, limit Subsection (3).	Noted
(6)	In developing plans referred to in Paragraph (l)(f), an airport lessee company must have regard to Australian Standard AS 2021-2000 (Acoustics – Aircraft noise intrusion – Building Siting and Construction) as in force or existing at that time.	Not applicable
(7)	Subsection (6) does not, by implication, limit the matters to which regard may be had.	Noted

APPENDIX B
ABBREVIATIONS

AAE	Australian air Express (now known as Qantas Freight)
ABC	Airport Building Controller
ACM	Asbestos containing materials
ADS-B	Automatic dependent surveillance – broadcast
AEO	Airport Environment Officer
AEPR	*Airports (Environment Protection) Regulations 1997* (Cwth)
AHC	Australian Heritage Council
AHD	Australian height datum
ALC	Airport lease company
ANEF	Aircraft noise exposure forecast
ARI	Average recurrence interval
AsA	Airservices Australia
A-SMGCS	Advanced surface movement, guidance and control system
ASS	Acid sulfate soils
BCA	Building Code of Australia
BTEX	Benzene, toluene, ethylbenzene and xylenes
BTEXN	Benzene, toluene, ethylbenzene, xylene and naphthalene
BTRE	Bureau of Transport and Resource Economics
CASA	Civil Aviation Safety Authority
CBD	Central business district
CEMP	Construction environmental management plan
CHL	Commonwealth Heritage List
CMP	Conservation management plan
CO	Carbon monoxide
CSB	Central Services Building
CTMP	Construction Traffic Management Plan
Cwth	Commonwealth
DA	Development application
dB/dBA	Decibel
DEC	Department of Environment and Conservation (NSW)
DECCW	Department of Environment, Climate Change and Water (NSW)
DIPNR	Department of Infrastructure, Planning and Natural Resources (NSW)
dMDP	draft Major Development Plan
EEC	Endangered ecological community
EMP	Environmental Management Plan
ENCM	Environmental Noise Control Manual
EPA	Environment Protection Authority (NSW)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection Biodiversity Conservation Act 1996* (Cwth)
FTE	Full time equivalent
GFA	Gross floor area
GFT	Global freight terminal
GPT	Gross pollutant trap
GSE	Ground support equipment
GSP	Gross state product
HC	Hydrocarbon
HF	High frequency
HMP	Heritage management plan
ICNG	Interim construction noise guideline
INP	Industrial noise policy
JUHI	Joint user hydrant installation
km	kilometre

L	litre
LTTMP	Long Term Transport Master Plan
m	metre
mg	milligram
mm	millimetre
M5	South-Western Motorway
MAD	Major airport development
MDP	Major Development Plan
NASAG	National Airports Safeguarding Advisory Group
NEPM	National environment protection measure
NHL	National Heritage List
NML	Noise management levels
N	Nitrogen
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPWS	National Parks and Wildlife Service
NSW	New South Wales
OCP	Organo-chlorine pesticides
OEH	Office of Environment and Heritage
OLS	Obstacle limitation surfaces
OPP	Organo-phosphate pesticides
P	Phosphorous
PAH	Polycyclic aromatic hydrocarbons
PANS-OPS	Procedures for Air Navigation Services Operations
PCB	Polychlorinated biphenyls
PCF	Planning Co-ordination Forum
pdMDP	Preliminary draft Major Development Plan
PDMP	Preliminary Draft Master Plan 2033
PM_{10}	Particulate matter 10 micrometres or less in diameter
PRM	Precision runway monitor
pphm	parts per hundred million
QTA	Quick turnaround (rental car wash, vacuum and fuel facility)
RAC	Rental car
RCP	Reinforced concrete pipe
REF	Review of environmental factors
RL	Reduced level
RMS	NSW Roads and Maritime Services
RTA	NSW Roads and Traffic Authority
SACF	Sydney Airport Community Forum
SACL	Sydney Airport Corporation Limited
SMCMA	Sydney Metropolitan Catchment Management Authority
SO_2	Sulphur dioxide
SWMP	Soil and water management plan
T1	Terminal 1 (international terminal)
T2	Terminal 2 (domestic terminal – Virgin)
T3	Terminal 3 (domestic terminal – Qantas)
TfNSW	Transport for New South Wales
TMP	Traffic management plan
TPH	Total petroleum hydrocarbons
TSC Act	*Threatened Species Conservation Act 1996* (NSW)
VHF	Very high frequency
VOCs	Volatile organic compounds
vph	Vehicles per hour
WAM	Wide area multilateration
WDA	WestConnex Delivery Authority
µg	microgram

APPENDIX C GLOSSARY

Term	Definition	
Active transport	Cycling and walking and related behavioural change programs	
Airside areas	That part of the airport designated as airside and to which the general public does not have free access.	
Landside areas	That portion of the airport not designated airside and to which the general public normally has free access.	
Level of service	The level of service of an intersection is determined from the average vehicle delay. There are six levels of service from A to F as follows:	
	Level of service	Average vehicle delay
	A	0-14 seconds
	B	15-28 seconds
	C	29-42 seconds
	D	43-56 seconds
	E	57-70 seconds
	F	More than 70 seconds
Obstacle limitation surface	A series of surfaces that define the limits to which objects may project into airspace in the immediate vicinity of airports. These surfaces protect approaches to runways, takeoffs and missed approaches from obstructions.	
T2/T3 precinct	The north-east sector of Sydney Airport including the common user (T2) and Qantas (T3) domestic and regional terminals and related landside and airside areas east of Runway 16R/34L and north of Runway 07/25.	
Way-finding	All the ways in which people (including pedestrians and motorists) orient themselves in physical space and navigate from place to place.	

APPENDIX D REFERENCES

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APPENDIX E
SUMMARY OF STAKEHOLDER COMMENTS

Who was consulted	Summary of issues raised
Sydney Airport Community Forum (SACF) Membership comprises: • Members of the Australian Parliament (Reid, Sydney, Kingsford-Smith, Watson, Barton, North Sydney, Bennelong, Bradfield, Wentworth and Cook) • Members of the NSW Parliament (Heffron, Marrickville and Sydney). • Mayors of Marrickville, Ashfield, Canterbury, Leichhardt, Botany Bay and Sutherland municipalities • Two airline industry representatives • Sydney Airport Corporation Limited	Briefing materials sent to SACF members on 7 April 2014. Members were briefed at the meeting held on 23 May 2014. Issues raised include: • Impact of free parking area on congestion in the T2 precinct. • New bus services are important, particularly connecting the Sutherland Shire to the airport. • Maintain kerbside drop-off outside the existing terminals.
Sydney Airport Planning Coordination Forum (PCF) Membership comprises: • Sydney Airport CEO • NSW Government agencies (Department of Premier and Cabinet, NSW Planning and Environment, Department of Trade and Investment, Regional Infrastructure and Services, Transport for NSW and Environment Protection Authority) • Australian Government agencies (Department of Infrastructure and Regional Development and Airservices Australia) • Local Government (City of Botany Bay Council, City of Sydney Council, Rockdale City Council, Sutherland Shire Council and Marrickville Council) • Sydney Business Chamber	Briefing materials sent to PCF members on 7 April 2014. No issues have yet been raised by members. Comments will be made during the public exhibition period.
Australian Government agencies: • Department of Infrastructure and Regional Development • Department of the Environment • Airservices Australia • Civil Aviation Safety Authority • Airport Environment Officer • Airport Building Controller	Department of Infrastructure and Regional Development (including advice from Department of the Environment on exposure draft major development plan) • The Department of the Environment (DoE) has determined that the edMDP is unlikely to have a significant impact on the environment under s.161A of the *Environment Protection and Biodiversity Conservation Act 1999*. • The distance between the proposed Ground Transport Interchange (GTI) and T2/T3 is significant, particularly for disabled and elderly patrons. • Explain how pedestrians will move through the existing car park facilities in an efficient manner so as to minimise the potential for vehicle and pedestrian conflict. • Proposed relocation of the car rental and Quick Turnaround Facility. • Need to identify construction site compounds and staging areas. • Additional disabled car spaces need to be provided. • Mechanical ventilation of the GTI needs to satisfy requirements of relevant Australian Standard. • Storage for bicycles in GTI needs to be consistent with state or local requirements. • Noise exposure for patrons in proposed hotel. • Various sustainability issues concerning proposed new hotel.

Who was consulted	Summary of issues raised
	Airservices Australia (Airservices) • Need to ensure diagrams and drawings are high enough resolution and are able to be read. • Need to include analysis of any potential impact to Sydney Airport's Advanced Surface Movement Guidance and Control System. • Airservices assessment of proposed developments to include matters affecting any navigation aid, radar, aircraft operations or the existing air traffic control tower. • Air turbulence – basis of assessment. • Concept design of structures and materials selection similar to existing airport buildings. • Construction methodology including use of cranes. Civil Aviation Safety Authority • Interest in Airservices' assessment. • Air turbulence – basis of assessment. • Concept design typical of other airport developments. • Airspace protection surfaces – constraints across site. • Interest in construction methodology relevant to aircraft operations.
NSW Government agencies: • Transport for NSW (TfNSW) • Roads and Maritime Services (RMS) • WestConnex Delivery Authority (WDA)	TfNSW • Relationship of the works to the Robey Street and O'Riordan Street design and circulation interface RMS • Relationship of the works to the widening of Joyce Drive proposed as part of the Westconnex Enabling Works – Airport East • Relationship of the works to the Robey Street and O'Riordan Street design and circulation interface, including optimising sightlines, and access to the Stamford Hotel. WDA • Relationship of the works to the Qantas Drive interface • Relationship of the works to the Robey Street and O'Riordan Street design and circulation interface
Local Government agencies (including Local Traffic Committees): • City of Botany Bay Council • Rockdale City Council • Marrickville Council • City of Sydney Council	City of Botany Bay Council • Relationship of works in the T1 precinct with those planned for the T2/T3 precinct. • Status of approval of the off-airport changes to the road network. • Access to Stamford Hotel. • Need to understand any impacts on residents who live in Robey Street (and other nearby streets) • Ground-based noise impacts need to managed. • Pedestrian experience for people who need to walk from the Ground Transport Interchange to the passenger terminals. • Location of bike tracks. • Location of bus services. Rockdale City Council • Relationship of works in the T1 precinct with those planned for the T2/T3 precinct. • Access to Stamford Hotel. • Impact on Sydney Airport's plans if NSW Government doesn't proceed with changes to the off-airport road network. • Pedestrian experience for people who need to walk from the Ground Transport Interchange to the passenger terminals (especially older or disabled people). • Distance of bus facility from the passenger terminals. • Access by taxis.

Who was consulted	Summary of issues raised
	Marrickville Council • Traffic modelling related issues, including assumptions made and outcomes concerning impact on off-airport roads in the vicinity of the airport. • Proposed WestConnex and how it affects the proposed changes in the pdMDP. • Access by taxis. • New and expanded bus services. • Future of the hangars that are proposed to be removed. • Bus access from O'Riordan Street to new Ground Transport Interchange. • Car parking issues, including the increase in number of spaces, pricing and modelling for future demand. • Need to manage construction-related traffic and parking. • Free pick-up area can cause traffic congestion at peak times. • Access to terminals by bicycles and links to off-airport bike path network. • Potential for disruption to motorists and the need to ensure effective communications. City of Sydney Council • Traffic modelling related issues, including assumptions made and outcomes concerning intersection performance. • Projections for future intersection performance if WestConnex does not proceed. • Support for new bus and rail services. • Issues concerning the operation of the proposed new hotel. • Increase in the number of car parking spaces.
Transport industry – Taxi Council – Bus Operators – Motor Traders Association and Limousine Operators	Taxi Council • Bus operations in relation to taxi operations. • Need to understand any impact to taxi recirculation operations and access to Unigas facility, including during construction periods. • Understand operations of the taxi overflow holding bay. • Capacity of taxi holding bays. Bus Operators • Understand TBus operations once works are completed. • Support for new Ground Transport Interchange and that coaches will not be required to travel through the horseshoe, especially in peak periods. • Understand the coach and public bus drop-off/pick-up arrangement, its capacity and the pedestrian experience within this facility. • Provision of lay-over facilities. • Pedestrian experience for disabled and the elderly. Motor Traders Association and Limousine Operators • Locations of any temporary parking areas during construction periods. • Need to ensure taxis accessing the taxi holding area does not obstruct access to limousine parking area. • Pedestrian experience for people who need to walk from the Ground Transport Interchange to the terminals.

Who was consulted	Summary of issues raised
Airlines using Sydney Airport or their representatives: – Board of Airline Representatives of Australia – Qantas – Regional Express (Rex) – Virgin Australia	Board of Airline Representatives of Australia • Supported ground transport solutions in the pdMDP. • No immediate issues have yet been raised. Comments will be made during the public exhibition period. Qantas • Supported ground transport solutions in the pdMDP. • No immediate issues have yet been raised. Comments will be made during the public exhibition period. Regional Express (Rex) • Supported ground transport solutions in the pdMDP. • Will solution improve drop-off performance at T2 and T3 • Understand access from/to Ross Smith Avenue • Understand impacts during construction period • Understand relationship/integration to WestConnex work Virgin Australia • Supported ground transport solutions in the pdMDP. • No immediate issues have yet been raised. Comments will be made during the public exhibition period.
Other aviation industry and related stakeholders: – Rental car companies: • Avis • Budget • Europcar • Hertz • Red Spot • Thrifty – Stamford Hotel and Valad Property	Rental car companies • No immediate issues have yet been raised. Comments will be made during the public exhibition period Stamford Hotel and Valad Property • Relationship of the works to the Robey Street and O'Riordan Street design and circulation interface, including optimising sightlines, and access to the Stamford Hotel.

APPENDIX F
SUMMARY OF STAKEHOLDER COMMENTS FROM NOVEMBER CONSULTATION

Who was consulted	Summary of issues raised
Sydney Airport Community Forum (SACF) Membership comprises: • Members of the Australian Parliament (Reid, Sydney, Kingsford-Smith, Watson, Barton, North Sydney, Bennelong, Bradfield, Wentworth and Cook) • Members of the NSW Parliament (Heffron, Marrickville and Sydney). • Mayors of Marrickville, Ashfield, Canterbury, Leichhardt, Botany Bay and Sutherland municipalities • Two airline industry representatives • Sydney Airport Corporation Limited	No issues relevant to the updated preliminary draft Major Development plan were raised by members
Sydney Airport Planning Coordination Forum Membership comprises: • Sydney Airport • Department of Infrastructure and Regional Development and Airservices Australia • NSW Department of Premier and Cabinet, Roads and Maritime Services, Transport for NSW, and department of Planning and Environment • City of Botany Bay, Marrickville, Rockdale City, City of Sydney and Sutherland Shire Councils • Sydney Business Chamber • SACF Chair	• What work has Sydney Airport being doing with Sydney Buses to ensure new bus routes and services are provided to the bus facility within the Ground Transport Interchange. • What will happen to the existing short term pick-up area, which is already causing congestion in the T2/T3 precinct?
Australian Government agencies: • Airservices Australia • Airport Building Controller	Airservices Australia (Airservices) • Diagrams and drawings are high enough resolution and are able to be read. • Need to include analysis of any potential impact to Sydney Airport's Advanced Surface Movement Guidance and Control System. • Airservices assessment of proposed developments to include matters affecting any navigation aid, radar, aircraft operations or the existing air traffic control tower. • Concept design of structures and materials selection similar to existing airport buildings. • Construction methodology including use of cranes. Airport Building Controller • No immediate issues were raised. • Additional proposed developments will be reviewed and comments submitted directly to the Department

Who was consulted	Summary of issues raised
NSW Government agencies: • Transport for NSW (TfNSW) • Roads and Maritime Services (RMS) • WestConnex Delivery Authority (WDA)	TfNSW • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period • Willingness to continue engaging with Sydney Airport on active transport strategies RMS • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period • Potential right-hand turn off Joyce Drive at Lords Road to be discussed in a different forum • Willingness to continue engaging with Sydney Airport on active transport strategies WDA • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period • Willingness to continue engaging with Sydney Airport on active transport strategies
Local Government authorities: • City of Botany Bay Council • Rockdale City Council • Marrickville Council	City of Botany Bay Council • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period Rockdale City Council • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period Marrickville Council • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period
Transport industry – Airport Link	Airport Link • Supported ground transport solutions in the pdMDP • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period
Airlines using Sydney Airport or their representatives: – Qantas – Virgin Australia	Qantas • Supported ground transport solutions in the pdMDP • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period Virgin Australia • Supported ground transport solutions in the pdMDP • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period
Other aviation industry and related stakeholders: – Rental car companies: • Avis • Budget • Europcar • Hertz • Red Spot • Thrifty	Rental car companies • No immediate issues were raised. The revised pdMDP will be reviewed during the public exhibition period

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