



Roads &  
Maritime

# **Airport East precinct – WestConnex enabling works**

August 2015

Submissions Report

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August 2015

## Submissions Report

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# Executive summary

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Roads and Maritime Services (Roads and Maritime) propose to build the Airport East precinct – WestConnex enabling works (the proposal), which would improve traffic flow and access to Sydney Airport, Port Botany and the future WestConnex Motorway. It would also allow the future duplication of the Port Botany Freight Rail Line and improve the overall efficiency of the rail line.

The assessment of the proposal is documented in the Review of Environmental Factors (REF) prepared for the Airport East precinct – WestConnex enabling works (Roads and Maritime, 2015). The REF was placed on public display between 16 February and 13 March 2015 for the community and stakeholders to provide their feedback. The REF was displayed at three locations and was also placed on the Roads and Maritime website and made available for download.

Roads and Maritime accepted submissions until 8 April 2015. Eleven submissions were received, including eight submissions from the community, and one submission from ARTcycle, NSW Taxi Council, and Sydney Airport Corporation Limited (SACL). This report summarises the comments raised in the submissions.

## Comments raised by the community and stakeholders

Submissions received raised the below comments. These have been addressed in Chapter 2 of this document.

- Suggestions for alternative proposals and changes to the design
- Roads and Maritime's consultation strategy
- Impact of the proposal on traffic volumes, local traffic and access
- Suggestions and queries regarding cyclist facilities
- Noise impacts of the proposal during construction and operation
- Impacts of the proposal on private property and land leased to SACL
- Reference to, and impact of, the proposal on airport operations
- Details regarding the remediation of land
- Reference to utility services, relocation and protection of assets
- Proposal objectives and options considered
- Environmental justification of the proposal
- Integration of the proposal with other projects
- Reference to Commonwealth legislation, policies and guidelines
- Reference to watercourses and land management boundaries
- Details regarding the groundwater management strategy
- Details regarding the urban design strategy.

## Additional assessment

Roads and Maritime have prepared an additional assessment to assess potential noise impacts of the proposal on the Ibis Hotel (Wilkinson Murray, 2015a). The *Australian/New Zealand Standard 2107:2000 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors* (AS/NZS 2107:2000) recommends that the following internal noise limits are not exceeded in hotels located near major roads:

- Sleeping Areas -  $L_{Aeq}$  35 dB(A) satisfactory and  $L_{Aeq}$  40 dB(A) maximum.

In addition, the assessment adopted an external noise criterion of  $L_{Aeq}$  75 dB(A) for the construction and operation of the proposal.

With the exception of the Joyce Drive widening, the proposal would not exceed the adopted external noise criteria during most of the construction period.

The proposal would not exceed the adopted external noise criteria during operation and marginal changes in traffic noise levels (<1 dB) are predicted between 2013 and 2018. Changes in noise levels <1dB are not usually perceptible to the human ear therefore any noise impacts are considered minor or negligible. It is considered unlikely that the Ibis Hotel would experience any noticeable change in perceived external or internal noise levels during the operation of the proposal.

### **Additional items to the REF**

Review of the submissions has resulted in the following changes to the REF. These include:

- Changes to the executive summary to outline the improvement for vehicles travelling between Sydney Airport and Southern Cross Drive
- Additions to the strategic planning and policy framework, including Commonwealth legislation and Sydney Airport strategies and plans
- Clarifying definitions and terminology with regards to prescribed airspace
- Additional discussion to consider cumulative noise impacts associated with the proposal
- Clarifying definitions and terminology associated with Mill Ponds
- Changes to land use mapping in the proposal area.

Since the display of the REF, Roads and Maritime has made revised property acquisition requirements. The proposal would require the full acquisition of the Beckenham Memorial Church (Lot 8/DP3280 and Lot 7/DP3280) and no longer require the full acquisition of two private properties, including 1 Wentworth Avenue and 3 Wentworth Avenue, Mascot (Lot 1/DP455496).

In addition, Roads and Maritime has refined the proposal area. The refinement includes an adjustment of the proposal area boundary to include about 400 metres of shared-use path along the south of Wentworth Avenue. The existing pedestrian path located on the south side of Wentworth Avenue would be widened and extended to connect to the existing cycleway at Todd Reserve, Mascot. The potential environmental impacts of the shared-use path along the south of Wentworth Avenue have been assessed in the REF. As such, adjustment to the proposal area boundary does not require additional assessment in this report.

### **Conclusion of this report**

The impacts of the proposal are not considered to be significant and the identified impacts will be appropriately managed and mitigated with implementation of the identified management measures.

The proposal meets the project objectives, while effectively minimising environmental impacts and considering community comments.

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# 1 Introduction and background

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## 1.1 Purpose of this report

This Submissions Report relates to the review of environmental factors (REF) prepared for the Airport East precinct – WestConnex enabling works, and should be read in conjunction with that document.

The REF was placed on public display between 16 February and 13 March 2015. Submissions relating to the proposal and the REF were received by Roads and Maritime up until 8 April 2015. This Submissions Report:

- Provides an overview of stakeholder and individual submissions received, summarises comments raised, and provides responses to each comment (**Chapter 2**)
- Provides an overview of SACL's submission, summarises comments raised, and provides responses to each comment (**Chapter 3**)
- Describes addenda to the REF (**Chapter 4**)
- Provides an additional assessment for potential noise impacts on the Ibis Hotel (**Chapter 5**)
- Lists new or revised environmental management and mitigation measures (**Chapter 6**).

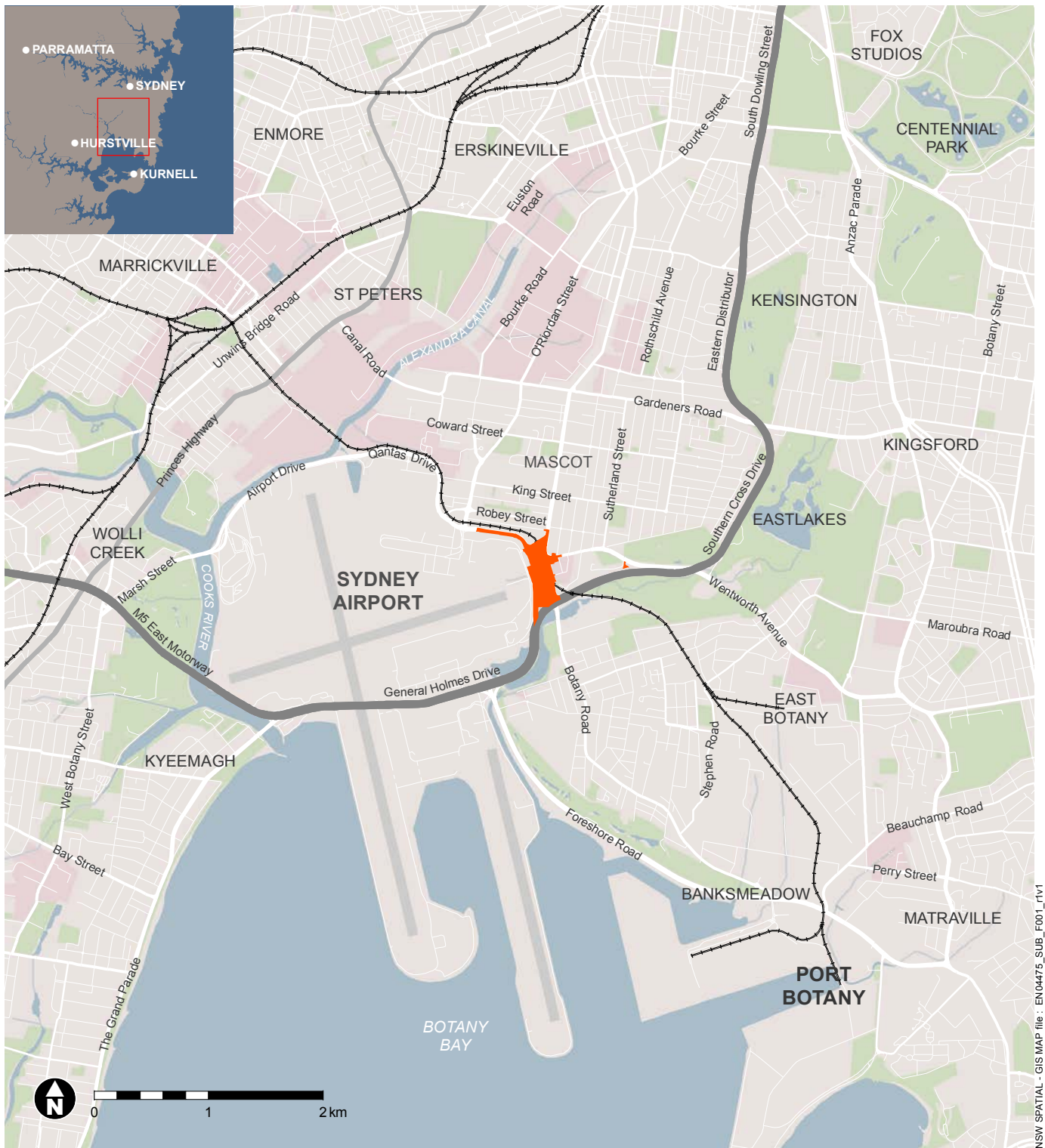
## 1.2 The proposal

Roads and Maritime propose to build the Airport East precinct – WestConnex enabling works (the proposal), which would improve traffic flow and access to Sydney Airport, Port Botany and the future WestConnex Motorway. It would also allow the future duplication of the Port Botany Freight Rail Line and improve the overall efficiency of the rail line. **Figure 1-1** shows the regional context of the proposal as presented in the REF.

The main features of the proposal are to (refer to **Figure 1-2**):

- Separate the road network from the Port Botany Freight Rail Line. This would involve:
  - Extending Wentworth Avenue beneath the Port Botany Freight Rail Line to link with General Holmes Drive. The Wentworth Avenue underpass would have nine lanes, with five lanes eastbound and four lanes westbound, and a minimum 4.7 metres clearance
  - Building two rail bridges over the Wentworth Avenue underpass
  - Removing the General Holmes Drive rail level crossing of the Port Botany Freight Rail Line, improving safety and enabling increased speed for freight trains.
- Adjust and locally relocate utilities
- Provide a bridge over the stormwater channel which runs parallel to General Holmes Drive and a protection slab over sewer and gas utilities on the extension of Wentworth Avenue
- Provide a new intersection at General Holmes Drive and Wentworth Avenue
- Upgrade or adjust the intersections at:
  - Wentworth Avenue and Botany Road
  - General Holmes Drive and Mill Pond Road
  - Botany Road and Mill Pond Road

- General Holmes Drive, Joyce Drive and Ross Smith Avenue
- General Holmes Drive and Botany Road.
- Widen Joyce Drive and General Holmes Drive between about 100 metres east of O’Riordan Street and 175 metres south of Mill Pond Road to three lanes in each direction
- Adjust and locally relocate drainage infrastructure including:
  - Replacing grassed open drain at Joyce Drive with a pipe and pit system
  - Installing a permanent pump at the low point of the Wentworth Avenue underpass.
- Landscape and replant generally on road verges and in the area of land between General Holmes Drive and the Port Botany Freight Rail Line
- Provide new facilities – and relocate existing facilities – for pedestrians, cyclists and public transport, including:
  - A new shared-use path linking to the existing cycleway at Todd Reserve on Wentworth Avenue
  - A new shared path on Botany Road from the Botany Road and Wentworth Avenue intersection to Baxter Road
  - Removing the pedestrian path on the northern side of Joyce Drive, which would be replaced with a new shared path along Baxter Road as part of a separate project in the WestConnex Enabling Works packages of work
  - Relocating the northbound bus stop on Botany Road about 70 metres to the south of its current location.
- Provide temporary construction ancillary facilities, including construction compounds, stockpile sites and erosion and sedimentation control measures.



**Figure 1-1** Regional context for the proposal

**Legend**

- Proposal area
- Parklands
- Industrial areas
- Motorway
- Railway



**Figure 1-2** The proposal as presented in the REF

### 1.3 REF display

Roads and Maritime prepared a REF to assess the environmental impacts of the proposal. The REF was publically displayed between 16 February and 13 March 2015. Roads and Maritime accepted submissions until 8 April 2015. A copy of the community update issued before the public display is included in **Appendix A**.

The REF was displayed at three locations, as detailed in **Table 1-1**. It was also placed on the Roads and Maritime website and was made available for download. The display locations and website link were advertised in the *Wentworth Adviser* on 11 February 2015 and 25 February 2015.

In addition to the public display, an invitation to comment and an electronic copy of the REF was emailed to the following identified stakeholders:

- The Commonwealth Department of Infrastructure and Regional Development
- Sydney Airport Corporation Limited (SACL)
- Botany Bay City Council
- Australian Rail Track Corporation (ARTC).

**Table 1-1 Display locations of the REF**

Location	Address
Transport Information Centre	Corner George and King Streets 388 George Street Sydney NSW 2000
City of Botany Bay Council	Administration Centre 141 Coward Street Mascot NSW 2020
Central Library	Westfield Shoppingtown Ground floor, Banks Avenue Eastgardens NSW 2035

## 2 Response to comments raised by stakeholders

Roads and Maritime received 11 submissions, accepted up until 8 April 2015. **Table 2-1** lists the respondents and each respondent's allocated submission number. The table also indicates where the comments from each submission have been addressed in the REF.

**Table 2-1 List of respondents and where comments are addressed in this report**

Respondent	Submission no.	Section number where comments are addressed
ARTcycle	1	Section 2.4.3.1, Section 2.4.3.2, Section 2.4.3.3
NSW Taxi Council	2	Section 2.1
Individual	3	Section 2.2.2, Section 2.4.1, Section 2.4.2
Individual	4	Section 2.2.2
Individual	5	Section 2.2.2
Individual	6	Section 2.4.3.1, Section 2.4.3.2, Section 2.4.3.4
Individual	7	Section 2.5.1, Section 2.6.1
SACL	8	Chapter 3
Individual	9	Section 2.2.2
Individual	10	Section 2.2.1, Section 2.3.1, Section 2.4.1, Section 2.4.2
Individual	11	Section 2.2.1, Section 2.4.1

### 2.1 Overview of comments raised

A total of 11 submissions were received in response to the display of the REF comprising eight submissions from the community and one submission from ARTcycle, NSW Taxi Council, and SACL.

Each submission has been examined individually to understand the comments being raised. The comments raised in each submission have been extracted and collated, and corresponding responses to the issues have been provided. Where similar comments have been raised in different submissions, only one response has been provided. The comments raised, and Roads and Maritime's response, forms the basis of this chapter. Comments raised by SACL, and Roads and Maritime's response, are presented in **Chapter 3**.

Of the submissions received, one submission supported the proposal, and one submission supported the proposal but objected to specific components. Three submissions were against the proposal and six submissions did not offer a position on the proposal.

The main comments raised by the community related to:

- The impact of the proposal on traffic volumes, local traffic and access
- Suggestions for alternative proposals and changes to the design
- Noise impacts of the proposal on private property and land leased to SACL
- Suggestions and queries regarding cyclist facilities.

Other considerations included:

- Environmental justification of the proposal
- Roads and Maritime's consultation strategy
- Noise impacts of the proposal during construction and operation
- Reference to, and impact of, the proposal on airport operations
- Reference to utility services, relocation and protection of assets
- Details regarding the remediation of land
- Integration of the proposal with other projects
- Reference to Commonwealth legislation, policies and guidelines
- Reference to watercourses and land management boundaries
- Details regarding the groundwater management strategy
- Details regarding the urban design strategy.

No form letters were received during the submissions period.

## **2.2 Description of the proposal**

### **2.2.1 Alternative proposal**

#### *Submission number*

10 – Individual

11 – Individual

#### *Comment description*

An alternative proposal was presented, which the respondent considers would provide improved local access for residents. The key aspects of the alternative proposal include:

1. Closing the entrance of Dransfield Avenue to all traffic (excluding Flower Power customers and delivery vehicles)
2. Extending Dransfield Avenue to connect with Wentworth Avenue at the Sutherland Street intersection
3. A new service road located behind residences south of Wentworth Avenue (between Todd Reserve and Dransfield Avenue)
4. New traffic lights and a pedestrian crossing at the McBurney Street and Alfred Street intersection
5. Closing Hardie Lane, Hardie Street, Johnson Lane and Johnson Street at their intersections with Wentworth Avenue, transferring traffic to Hollingshed Street, Frogmore Street, or the Alfred Street and Wentworth Avenue intersection for access to Botany Road and Wentworth Avenue.

#### *Response*

Roads and Maritime have reviewed the feasibility of the respondent's suggested alternative design in detail. A summary of the outcomes of the review is provided below.

#### Reconfiguration of Dransfield Avenue

1. Closing the Dransfield Avenue entrance and relocating it to connect to the Sutherland Street intersection would result in impacts to access to private

property located along the existing Dransfield Avenue. This change would also require the relocation or removal of cycle facilities currently located along Dransfield Avenue and in Todd Reserve. Although the full extent of impacts from the closure of Dransfield Avenue cannot be determined at this stage, it would likely require further widening of the footpath along the southern side of Wentworth Avenue.

2. The suggested extension of Dransfield Avenue to the Sutherland Street intersection would require the full acquisition of at least two properties near the Sutherland Street intersection, as well as partial acquisition of Todd Reserve and Flower Power. In addition, converting the current cul-de-sac to a through road would result in a change in noise and amenity impacts on dwellings in Dransfield Avenue.
3. A service road behind the 12 residences between Dransfield Avenue and Todd Reserve would impact significantly on these properties. The service road would require acquisition of private properties, and would result in the 12 residences being affected by roads from two sides. The service road would substantially reduce the amenity of these dwellings as a result of noise and visual impacts.

#### New traffic lights at intersections

4. Two new sets of traffic lights at the McBurney Street and Wentworth Avenue intersection, the Alfred Street and Wentworth Avenue intersection as well as an additional leg at the Sutherland Street intersection would result in increased congestion due to the close proximity of signalised intersections along Wentworth Avenue. This would result in impacts to through traffic movements along Wentworth Avenue and lead to increased delays for motorists. The proposal has been designed to reduce congestion by improving traffic flow along Wentworth Avenue. This aspect of the alternative proposal would result in increased congestion both to the east and west of the new traffic lights, reducing the network capacity and performance in this area.

#### Closing local lanes and streets

5. It is acknowledged that closing Hardie Lane, Hardie Street, Johnson Lane and Johnson Street at their intersections with Wentworth Avenue would reduce the risk of commuters using local streets instead of Wentworth Avenue as part of their commutes. However, closing these lanes and streets would also have adverse impacts on local access within the proposal area. Lane and street closure would funnel local traffic onto Hollingshed Street and to a lesser extent, Frogmore Street, Alfred Street and Sutherland Street. This would result in concentrating local traffic volumes along these streets and increasing the potential for localised congestion at intersections. It would also have a significant impact on local access available to local residents on streets to be closed. This approach of closing local streets is not considered to be an appropriate method of improving local access in this area.

In summary, the alternative proposal would not improve local access in the vicinity of Wentworth Avenue. The increased congestion arising from the alternative proposal may have a negative impact on traffic performance within the proposal area and specifically at Wentworth Avenue. The alternative proposal would result in a substantially greater footprint than is currently proposed and would have significant impacts on the access of local residents, and would increase the amenity and noise impacts currently being experienced within the proposal area.



It should also be noted that many elements of the alternative design involves substantial reconfiguration of local roads for which Botany Bay City Council is responsible. These local adjustments are not directly within the scope of the proposal, which is to provide a light-vehicle standard rail underpass to replace the General Holmes Drive rail level crossing, and reduce current levels of congestion and improve the flow of road and rail traffic.

## **2.2.2 Changes to the design**

### *Submission numbers*

- 3 – Individual
- 4 – Individual
- 5 – Individual
- 9 – Individual

### *Comment description*

A number of respondents suggested changes to the design of the proposal. These suggestions included:

1. A flyover or tunnel to allow direct access from General Holmes Drive onto Southern Cross Drive
2. A right turn lane from Botany Road (northbound) onto Southern Cross Drive
3. A longer, dedicated left turn lane from Southern Cross Drive onto Botany Road (southbound).

### *Response*

#### Flyover/tunnel from General Holmes Drive onto Southern Cross Drive

1. A flyover from General Holmes Drive onto Southern Cross Drive would need to have sufficient clearance above Botany Road and Mill Pond Road. A flyover of this height would protrude into Sydney Airport's obstacle limitation surface (OLS), which comprises part of the airport's protected airspace. The flyover is likely to protrude into the OLS by about 10 metres and would likely be a permanent intrusion of the OLS. A flyover would therefore pose a hazard to aircraft (refer to Section 2.3.7 of the REF) and is therefore very unlikely to be granted planning approval from airport and airspace regulators.

A tunnel between General Holmes Drive and Southern Cross Drive under Mill Pond Road would not be feasible because:

- There is insufficient space in the General Holmes Drive corridor to build the western approach to the tunnel. Additional space would also be required to accommodate the grade separation at the General Holmes Drive and Mill Pond Road intersection. This would require additional property acquisition from Sydney Airport, which is not feasible as it would disrupt the east-west runway operations.
- The tunnel would need to reach a depth of at least eight metres below ground level to pass beneath the stormwater channel, gas, electricity, sewer and optical fibre infrastructure as described in Section 4.7 of the REF

- The short length of the tunnel would result in steep grades into and out of the tunnel, resulting in inadequate sight distances for motorists and unsafe entrance and exit from the tunnel
- The tunnel's proximity to Botany Bay, its location on a shallow groundwater table and its depth would require permanent pump out infrastructure that would be substantially greater than that required for the Wentworth Avenue underpass
- It would be prohibitively expensive and would result in relatively little traffic benefit.

Traffic modelling carried out for the proposal confirms that the existing connection between General Holmes Drive and Southern Cross Drive via Mill Pond Road meets the proposal's traffic performance objectives.

The proposal is expected to result in a minor increase of about 3,000 vehicles per day on Mill Pond Road (a five per cent increase). Mill Pond Road is expected to be able to cater for this minor increase in traffic volumes without an adverse impact on traffic performance, given that the traffic volumes which use Mill Pond Road are in the order of about 60,000 vehicles per day.

Traffic modelling of surveyed routes that use Mill Pond Road has identified reductions in travel time of up to 53 per cent in the morning peak period and up to 61 per cent in the evening peak periods. The improvements in travel time expected as part of the proposal indicate that the existing connection between General Holmes Drive and Southern Cross Drive via Mill Pond Road is sufficient.

#### Right turn lane from Botany Road (northbound) onto Southern Cross Drive

2. Roads and Maritime have considered the addition of a right turn lane from Botany Road (northbound) onto Southern Cross Drive. Investigations during concept design have found that there is insufficient space for a dedicated right turn lane on Botany Road (southbound) onto Southern Cross Drive due to the location of overpass pylons under Southern Cross Drive. Converting one of the through lanes on Botany Road (northbound) to a combined right/through lane would create congestion and disrupt the northbound traffic flow on Botany Road due to vehicles queuing to turn right. This would potentially result in increased travel times for vehicles travelling northbound on Botany Road. Vehicles wishing to access Southern Cross Drive from Botany Road would need to turn right at Wentworth Avenue and access Southern Cross Drive via the onramps.

#### Dedicated left turn lane from Southern Cross Drive onto Botany Road (southbound)

3. Roads and Maritime have considered upgrading the left turn slip lane on Southern Cross Drive to a dedicated left turn lane at the intersection with Botany Road (southbound). Roads and Maritime have found that the widening on the left turn lane is not possible due to the close proximity of the abutments and retaining walls for the Southern Cross Drive overpass. A dedicated left turn lane in this area would also impact on existing drainage infrastructure. Accordingly, the left turn lane can only be lengthened a short distance and this would provide little benefit to reducing queuing traffic in this area. Roads and Maritime would confirm this during detailed design to understand the associated cost and benefits. During detailed design, Roads and Maritime would consider alternate linemarking strategies on the Southern Cross Drive off-ramp westbound to reduce the number of through vehicles queuing in the left turn lane and allow additional vehicles to access the current left turn lane.

## 2.3 Stakeholder and community consultation

### 2.3.1 Consultation strategy

#### *Submission numbers*

10 – Individual

#### *Comment description*

Raised concern that Roads and Maritime did not incorporate previous suggestions into the concept design displayed in the REF. Concern expressed regarding Roads and Maritime's method and approach to design suggestions offered and objections raised by the respondent.

#### *Response*

Roads and Maritime address comments and suggestions from the community as they arise. Suggestions from the public to amend the design have been considered by Roads and Maritime throughout the project development process. Where feasible and where suggestions assist in achieving project objectives, these suggestions have been incorporated into the design. Suggested amendments to the design considered during the Submissions Report process have been discussed in **Section 2.2**.

Roads and Maritime has been consulting with the community, affected stakeholders and affected businesses regarding the proposal since September 2013. Consultation has been carried out using a variety of means of communication to reach the widest possible audience. Consultation carried out to date includes:

- Community update brochures (November 2013, June 2014, and February 2015)
- Community information sessions at the following public displays:
  - WestConnex Enabling Works Proposal Report (Roads and Maritime, 2013) and strategic concept design between 11 November 2013 and 10 January 2014
  - WestConnex Enabling Works – Airport East Precinct Review of Environmental Factors (Roads and Maritime 2015) between 16 February 2015 and 13 March 2015.
- Newspaper advertisements (November 2013)
- Door knocking to notify and answer the queries of directly affected property owners
- Project website, which is used to keep the community up-to-date with relevant details of the proposal.

Roads and Maritime will continue to consider feedback during subsequent stages of proposal development. If the proposal is approved, Roads and Maritime will continue to keep the community informed during construction.

## 2.4 Land transport and access

### 2.4.1 Increased traffic volumes

#### *Submission numbers*

- 3 – Individual
- 10 – Individual
- 11 – Individual

#### *Comment description*

1. Expressed concern regarding the increased traffic volumes and resultant congestion on Wentworth Avenue.
2. Suggested the success of the proposal is dependent on the limited capacity of Wentworth Avenue.
3. Expressed concern over current traffic congestion during peak hour from vehicles turning right from Wentworth Avenue onto Southern Cross Drive.
4. Expressed concern regarding motorists travelling between Sydney Airport and the Sydney CBD using Wentworth Avenue instead of Southern Cross Drive, leading to congestion on Wentworth Avenue.
5. Concern that the proposal would result in more traffic problems than it would solve.

#### *Response*

1. Traffic modelling carried out as part of the Traffic and Transport Working Paper (refer to Appendix G of the REF) has considered flow-on traffic effects on Wentworth Avenue. Traffic modelling found that the following increases in traffic volumes are expected from the no-build to the build scenarios:
  - About 57 per cent for the average daily traffic numbers (from 18,107 to 28,390 vehicles per day)
  - About 87 per cent for the morning peak period (from 3,031 to 5,643 vehicles per hour)
  - About 50 per cent for the evening peak period (from 4,121 to 6,196 vehicles per hour).

While Wentworth Avenue would experience increases in traffic volumes as a result of the proposal, traffic modelling has also found that there is sufficient capacity on Wentworth Avenue to cope with the increases in traffic associated with the proposal (as discussed below).

The proposal would result in the following changes to network performance at Wentworth Avenue between Botany Road and Sutherland Street:

- An improvement in the Level of Service (LoS) and percentage of free flow for the morning peak eastbound from LoS D (40 per cent of free flow) to LoS C (60 per cent of free flow)
- A minor reduction in the LoS and percentage of free flow for the morning peak westbound from LoS C (60 per cent of free flow) to LoS D (50 per cent of free flow)

- A reduction in the LoS and percentage of free flow for the evening peak eastbound from LoS A (100 per cent of free flow) to LoS D (50 per cent of free flow)
- A minor reduction in the LoS and percentage of free flow for the evening peak westbound from LoS E (30 per cent of free flow) to LoS F (10 per cent of free flow).

Although a reduction in the LoS and percentage of free flow would be experienced for the evening peak in the eastbound direction between the build and no build scenarios, the impacts on the traffic performance along Wentworth Avenue are considered to be justifiable, given the overall benefits to the network in reducing congestion.

Overall, the proposal would improve network performance by increasing travel speed as a proportion of free-flow speeds for dominant areas within the proposal area. The proposal would also reduce travel times for the majority of surveyed roads during peak periods, and improve connectivity to local roads, by reducing traffic and congestion.

2. One of the primary objectives of the proposal is to separate road and rail traffic at the General Holmes Drive level crossing, which currently represents the major congestion point within the proposal area (as discussed in Section 3.1 of the REF). The Wentworth Avenue underpass, which would replace the General Holmes Drive level crossing, would result in changes to traffic movements and traffic flow throughout the proposal area to result in an overall reduction in congestion and travel times. While the proposal would increase the potential for localised congestion at Wentworth Avenue, it would result in significant traffic benefits achieved at a network scale. Midblock traffic modelling was carried out as part of the REF to identify impacts of the proposal on traffic flow along Wentworth Avenue. The modelling confirmed that Wentworth Avenue has sufficient capacity to cater for the additional traffic volumes associated with the proposal (refer to Appendix G of the REF).
3. Results from traffic modelling considered the impact of the proposal on the performance of the Wentworth Avenue northbound entry ramp to Southern Cross Drive. Traffic modelling found that similar traffic conditions at the Wentworth Avenue and Southern Cross Drive interchange are expected for both the proposal and the existing situation. Accordingly, the proposal would not have a significant impact on traffic congestion for vehicles travelling from Wentworth Avenue to Southern Cross Drive.

Specifically, in the morning peak period, performance remains similar with LoS B across both the 2018 'No Build' and 2018 proposal scenarios. Average speeds on the Wentworth Avenue northbound entry ramp increase slightly from 42 kilometres per hour to 44 kilometres per hour from the 2018 'No Build' and 2018 'Proposal' scenarios. In the evening peak period, both options have a LoS C performance with average speed reducing from 37 kilometres per hour to 32 kilometres per hour in the 2018 'No Build' and 2018 'Proposal' scenarios.

4. The proposal encourages traffic to continue to use Southern Cross Drive and Mill Pond Road as the preferred route to access Sydney Airport. This is because the proposal would improve travel times from Southern Cross Drive to Sydney Airport by:

- Reducing travel times by about 50 per cent in the morning peak between Southern Cross Drive to Sydney Airport
- Reducing travel times of about 60 per cent in the evening peak between Sydney Airport and Southern Cross Drive.

These travel time savings would not be available to motorists if they were to use the Wentworth Avenue route. In addition, the signposting and directional signage strategy would label Southern Cross Drive, Mill Pond Road and General Holmes Drive as the dominant route. However, it should be noted that Wentworth Avenue, as an arterial road, provides an alternative route for motorists in the event of an incident on the dominant route.

5. The traffic benefits associated with the proposal are outlined in Section 7.1 and Appendix G of the REF.

In summary, traffic modelling carried out for the REF has identified that the proposal would improve access to and from the proposal area for vehicles (including buses and taxis), pedestrians and cyclists.

This is demonstrated by traffic modelling results, which show that with the proposal the road network has higher average traffic speeds, lower travel times, less congestion and less potential for gridlock. The proposal would address congestion issues associated with the growth in traffic volumes within the local road network. The proposal would also result in a minor change to routes within the study area, and would improve safety by removing the level crossing. Two routes through the proposal area would experience travel time increases of less than one minute due to the proposal. These routes include from Botany Road (north of Robey Street) to Botany Road (south of Mill Pond Road) and General Holmes Drive (northbound traffic, south of Mill Pond Road) to Southern Cross Drive (eastbound traffic, north of Wentworth Avenue). This is a result of the reconfiguration of the road network, and specifically the introduction of the upgraded intersections along Wentworth Avenue on each side of the underpass. The impact associated with these minor increases in travel time is considered minimal considering the substantial reductions in travel times for the other routes.

#### **2.4.2 Impact on access within the local road network**

##### *Submission numbers*

- 3 – Individual
- 10 – Individual

##### *Comment description*

1. Expressed concern regarding impact to access/egress of local roads adjoining Wentworth Avenue, as a result of increased traffic volumes and congestion.
2. Expressed concern that the proposal would make it difficult for vehicles turning left from Sutherland Street onto Wentworth Avenue, due to the increased traffic congestion on Wentworth Avenue reducing the number of opportunities for turning traffic.

##### *Response*

1. The proposal would maintain the movements that are legally permitted at the local roads adjoining Wentworth Avenue.

Traffic light phasing at the Wentworth Avenue and Botany Road intersection would be optimised as part of the proposal. This is expected to provide drivers

turning from local roads with adequate opportunities to safely turn out of local roads onto Wentworth Avenue. Roads and Maritime would also investigate the phasing at the traffic lights at the Wentworth Avenue and Sutherland Street intersection to optimise turning opportunities for vehicles turning out of local streets onto Wentworth Avenue (westbound).

2. Traffic lights at the Wentworth Avenue and Sutherland Street intersection provide breaks in the traffic flow along Wentworth Avenue for vehicles turning out of Sutherland Street onto Wentworth Avenue. Roads and Maritime would investigate the phasing at the traffic lights at this intersection during detailed design to optimise turning opportunities for vehicles exiting Sutherland Street. Roads and Maritime would also maintain the free-flow left turn lane from Sutherland Street onto Wentworth Avenue.

### **2.4.3 Cyclist facilities**

#### 2.4.3.1 Changes to the design

##### *Submission numbers*

- 1 – ARTcycle
- 6 – Individual

##### *Comment description*

Respondents suggested a number of alternative cycle path designs. These include:

1. Provision of a shared path between Qantas Drive and Seventh Street
2. Provision of a cycleway which integrates Sir Joseph Banks Park into the Sydney Cycle Network, and improves access to Sydney Airport
3. Construction of the Botany Bay Trail, which provides for the provision of a cycleway between Sir Joseph Banks Park and Sir Reginald Ansett Drive. This would involve at grade cycle road crossings (bridges) at Robey Street, O'Riordan Street and across the proposed Wentworth Avenue extension
4. A series of short section cycleways (to provide connectivity from La Perouse, Botany Ports and General Holmes Drive) with a westbound link through the General Holmes Drive tunnel
5. Coordination of cycle path upgrades to be coordinated with various authorities.

##### *Response*

The responses below respond to the aspects of the alternative cycle paths that are located within or close to the proposal.

##### Shared path between Qantas Drive and Seventh Street

1. The suggested cycleway extension is located about 900 metres north-west of the proposed Wentworth Avenue underpass, within Commonwealth land leased to SACL. In addition, extending the proposal area to incorporate a shared path between Qantas Drive and Seventh Street would result in a substantially larger construction footprint, additional environmental impacts extending into Commonwealth land leased to SACL, and additional property acquisition.

### Cyclist access from Sir Joseph Banks Park to Sydney Domestic Airport

2. Cyclist access from Sir Joseph Banks Park to Sydney Domestic Airport is currently via the existing road network. General Holmes Drive and Joyce Drive within the proposal area form part of this route and currently provide on-road cyclist access. The proposal would maintain this level of access.

A dedicated cycleway along General Holmes Drive and Joyce Drive would require additional acquisition of SACL land to the west. Roads and Maritime are currently in negotiations with SACL to reduce land acquisition associated with the proposal (refer to **Section 3.3**). Shifting the design to the east is not feasible due to the presence of major underground utilities running generally parallel to General Holmes Drive, such as the South West Suburbs Ocean Outfall Sewer (SWOOS), Jemena gas main and the stormwater channel.

### Construction of the Botany Bay Trail

3. The relevant components of the Botany Bay Trail cycle network have been reviewed by Roads and Maritime for inclusion into the design. The components of the proposed Botany Bay Trail cycle network within the proposal area comprise a connected cycleway at the following locations:

- North-south along General Holmes Drive
- Across the Mill Pond Road bridge and over the stormwater channel
- Next to the Port Botany Freight Rail Line.

The alternative cycleway would diverge from the Port Botany Freight Rail Line at the General Holmes Drive level crossing, and would traverse across the north of General Holmes Drive, crossing Joyce Drive at the traffic lights into Ross Smith Avenue. The following factors contribute to the alternative cycle route being unfeasible as part of this proposal:

- The route requires widening of both the northern and southern sides of the Mill Pond Road bridge across the stormwater channel in order to provide sufficient width for the suggested cycleway and other underground utility infrastructure. The extent of construction required to adjust the Mill Pond Road bridge would extend construction timeframes and costs, and would require a substantially larger construction footprint. In addition, the construction of a bridge structure over the proposed Wentworth Avenue extension may result in additional impacts to utilities, additional vegetation clearing and result in increased environmental impacts.
- Proximity to the Port Botany Freight Rail Line would require a protective cage around the cycleway, the height of which would protrude into the OLS
- The route would require cycle/pedestrian phases in the General Holmes Drive/Mill Pond Road signals which would negatively affect the network operation.

The proposal maintains current cycle movements from south to west via the road network. While the proposal does not provide dedicated facilities to address cycle movements from south to west, it would improve east to west movements via a dedicated shared-path along Wentworth Avenue and Botany Road.



A series of short section cycleways to provide connectivity from La Perouse, Botany Ports and General Holmes Drive

4. The proposed westbound link through the General Holmes Drive tunnel (which is located under the north/south airport runways, about 1.4 kilometres south-west of the proposal area boundary) is outside the proposal area. It would not be upgraded to include a dedicated cycleway as part of the proposal. Extending the proposal area to this location would result in a substantially larger construction footprint, and additional environmental impacts and additional property acquisition.

Coordination of cycle path upgrades with authorities

5. The proposal seeks to provide improved infrastructure to all road users (including pedestrians and cyclists) within the proposal area. The proposal has incorporated cyclist infrastructure where a balance between environmental impact, property acquisition and functionality can be struck.

Transport for NSW is responsible for the coordination and development of the wider cyclist network. The WestConnex Enabling Works package of works would incorporate smaller sections of this strategy. Roads and Maritime would endeavour to provide safe facilities for all road users.

2.4.3.2 Optimisation and safety of the proposed cycleway

*Submission numbers*

- 1 – ARTcycle
- 6 – Individual

*Comment description*

1. Expressed concern that the proposed cycleway is poorly planned with multiple pinch points and difficult crossings
2. Expressed concern about the safety of the proposed cycleway, being insufficient and disconnected at Wentworth Avenue and Botany Road.

*Response*

1. The cycle route as proposed in the REF was selected based on an assessment of alternatives during the concept design. A number of alternative cycle routes were considered, including crossing the Wentworth Avenue/Botany Road intersection at the southern and western approaches. However, this alternative would require a two phase crossing which would adversely affect traffic turning right from Botany Road into the Wentworth Avenue underpass. This alternative requires five crossings compared to the current design which only requires four crossings and improves intersection performance at the Wentworth Avenue and Botany Road intersection. In addition, the alternative requires the shared path to be located on the western side of Botany Road, where there is insufficient space for a shared path due to its location between the railway corridor and Botany Road. The cycle route as proposed in the REF would improve the safety of cyclists by removing the rail level crossing (which poses a risk to both pedestrians and cyclists who use it) and including pedestrian and cyclist routes separated from road traffic along Botany Road and Wentworth Avenue. The cycle route as proposed in the REF, would also improve access for cyclists travelling to and within the study area.

2. The cycle route as proposed in the REF was selected as it allows for optimal intersection performance and represents the least amount of property acquisition and impact. As discussed above, the cycle route as proposed in the REF would also improve safety and access for both cyclists and pedestrians. The detailed design stage of the proposal would continue to investigate optimising the cycleway within the proposal area. This includes reducing crossings where feasible.

Cycle bridges across Wentworth Avenue were considered during the concept design. Due to the height required to provide adequate vehicle clearance, the cycle bridges would protrude into the OLS, impacting on airport operations. These bridges would also represent a high visual impact within the current landscape as they would tower over built structures in the vicinity.

There is insufficient width available in the existing Wentworth Avenue road corridor for bridge ramps. Partial acquisition of properties would need to be carried out by Roads and Maritime to allow the bridge ramps and footings to be installed. Additional acquisition would also be required to maintain a continuous shared path at ground level along Wentworth Avenue that does not conflict with the bridge ramps and footings.

For the reasons outlined above, cycle bridges across Wentworth Avenue were not considered further during the concept design process.

#### 2.4.3.3 Access to Sydney Airport

##### *Submission numbers*

1 – ARTcycle

##### *Comment description*

ARTcycle suggested that all infrastructure associated with the proposal be constructed in accordance with the CROW manual allowing for multiple ingress points to Sydney Airport.

##### *Response*

Cyclist facilities for the proposal would be designed with reference to the Austroads Guide to Road Design (2009). The need to provide access across the proposal area and to airport land has been balanced with the need to minimise acquisition of private properties, avoid unnecessary demolition of private dwellings and limit the footprint to minimise environmental impact.

As highlighted in Sydney's Cycling Future 2013, the proposal forms part of the East West link to Sydney Airport.

#### 2.4.3.4 Baxter Road shared path project

##### *Submission numbers*

6 – Individual

##### *Comment description*

Requested further information regarding the proposed cycleway on Baxter Avenue.

## *Response*

The Baxter Road shared path project would provide a shared path facility for cyclists and pedestrians between O'Riordan Street and Botany Road. This has been managed as a separate project by Roads and Maritime. Further information may be sought at the Baxter Road shared path project website at <http://www.rms.nsw.gov.au/projects/sydney-south/westconnex-enabling-work/index.html>.

## **2.5 Noise and vibration**

### **2.5.1 Operational noise impacts**

#### *Submission numbers*

7 – Individual

#### *Comment description*

Concern that the proposal would result in increased operational noise due to increased traffic on Wentworth Avenue.

#### *Response*

The operational noise impact assessment carried out for the REF details the noise impacts expected during operation of the proposal (refer to Appendix H of the REF). The assessment is summarised in Section 7.3.5 of the REF.

As discussed in Section 7.3.3 of the REF, the NSW Road Noise Policy (RNP) (DECCW, 2011) and Environmental Noise Management Manual (RTA, 2001) have outlined the need to identify the maximum level of noise events for road projects when there is potential for sleep disturbance from traffic noise. These disturbances are identified as a noise event that substantially exceeds the ambient noise environment, and may generate annoyance within a community. The proposal is not expected to result in an increase in maximum noise levels ( $L_{Amax}$ ) during operation.

However, the proposal is likely to result in minor increases in operational traffic noise levels ( $L_{Aeq}$ ) typically no more than 1 dB (refer to Section 7.3.5 of the REF and Appendix H). The two exceptions are the church on Botany Road and a residence on Hardie Street, which would require mitigation to be considered during detailed design. An assessment of feasible and reasonable noise mitigation options would be carried out in accordance with the mitigation strategy in Section 7.3 of the REF and Appendix H.

A number of receivers in the proposal area currently experience increases of the RNP, most of which are also acutely affected (these current impacts are not a result of the proposal). In accordance with the provisions of the Noise Mitigation Guidelines (Roads and Maritime, 2014) these receivers would be considered for noise mitigation during detailed design for the proposal. Some properties south of Wentworth Avenue have already been treated for noise under the Aircraft Noise Insulation Program, and therefore would not require further mitigation as part of this proposal. Roads and Maritime would contact properties that qualify for noise mitigation treatment during the detailed design phase of the proposal.

## **2.6 Land use and property**

### **2.6.1 Impact to private property**

#### *Submission numbers*

7 – Individual

#### *Comment description*

Concern over impacts to residential property during construction and operation.

#### *Response*

As discussed in Section 6 of the REF, Roads and Maritime have carried out a number of meetings to ensure that all affected landholders are consulted with before the REF display period. Roads and Maritime have contacted the respondent directly to clarify the construction and operational impacts of the proposal.

Impacts of the proposal on land use and property are discussed in Section 7.12 of the REF, and impacts of the proposal on socio economic are discussed in Section 7.13 of the REF.

## **3 Responses to comments raised by Sydney Airport Corporation Limited**

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SACL's submission has been assessed to understand the comment being raised. The comments raised in their submission have been extracted and collated, and corresponding responses to the comments have been provided. The comments raised by SACL and Roads and Maritime's response to these forms the basis of this chapter. Responses to submissions from the general public and other stakeholders are provided in **Chapter 2**.

### **3.1 Need and existing infrastructure**

#### **3.1.1 Reference to OLS and PANS-OPS**

##### *Comment description*

Requested the definitions of Obstacle Limitation Surface (OLS) and Procedures for Air Navigational Services-Aircraft Operations (PANS-OPS) include reference to 'prescribed airspace'.

##### *Response*

Roads and Maritime has amended the definitions of OLS and PANS-OPS to include reference to 'prescribed airspace' in response to SACL comments. These definitions are provided in **Section 4.3.1**.

#### **3.1.2 Reference to utility services**

##### *Comment description*

Requested further detail be provided regarding utility adjustments, provision of traffic signals, signage, lighting, safety barriers, street furniture and building leases in the REF.

##### *Response*

Section 2.3 of the REF discusses existing infrastructure in the proposal area, including traffic signals, safety barriers and street furniture. Section 4.7 of the REF outlines the utility relocation and protection required for the proposal. Further detail regarding adjustment, relocation or protection of utility services would be made available to SACL during the detailed design of the proposal.

### **3.2 Proposal objectives and options considered**

#### **3.2.1 Improved access on Southern Cross Drive**

##### *Comment description*

Requested that the justification for the preferred option in the executive summary of the REF refer to improving bus and taxi access in the context of future work on Southern Cross Drive.

## *Response*

The proposal would improve the road network and reduce traffic congestion within the proposal area. The proposal would improve travel times for vehicles travelling between Sydney Airport and Southern Cross Drive by:

- Reducing travel times by about 50 per cent in the morning peak for vehicles travelling from Southern Cross Drive to Sydney Airport
- Reducing travel times of about 60 per cent in the evening peak for vehicles travelling between Southern Cross Drive (eastbound) and Sydney Airport.

These improvements in network performance as a result of the proposal would also result in improved conditions for bus and taxi access between Sydney Airport and Southern Cross Drive.

An amendment to the REF executive summary has been included in **Section 4.1** outlining this benefit in association with the preferred option.

### **3.2.2 Environmental justification of the proposal**

#### *Comment description*

Expressed concern regarding the environmental scoring system outlined in Table 3-3 of the REF and requested that the REF be amended to provide further detail on the environmental justification for the proposal.

#### *Response*

Scores of 1 to 5 in Table 3-3 of the REF refer to rankings of options against each other. These scores do not represent a beneficial or negative impact of the proposal as a whole on the environment.

With regards to the environmental justification for the proposal, Section 7.17 of the REF summarises the beneficial and adverse effects of the proposal, Chapter 9 of the REF provides a conclusion regarding the environmental impacts associated with the proposal and Appendix C reviews the environmental impact of the project with consideration of Clause 228 of EP&A Act.

## **3.3 Description of the proposal**

### **3.3.1 Changes to the design**

#### *Comment description*

1. Expressed concern that the current design would have a significant impact on SACL land and assets along Joyce Drive. SACL suggested that Roads and Maritime adjust the Joyce Drive alignment to be further north of the current design.
2. Suggested that the proposal include a right turn lane from Joyce Drive (westbound) towards Ross Smith Avenue.
3. Suggested that the cul-de-sac at General Holmes Drive at the level crossing be replaced with left-in and left-out slip lanes to allow for access to the Port Botany Freight Rail Line easement.

## *Response*

1. During concept design, Roads and Maritime investigated moving the Joyce Drive alignment to the north. A substantial shift to the north is constrained by major underground utilities such as the South West Suburbs Ocean Outfall Sewer (SWOOS), Jemena gas main and 132kV Ausgrid transmission line (refer to Section 4.7 of the REF). Detailed design would continue to investigate opportunities to reduce impact on SACL land and assets.
2. Sufficient width for a right turn lane from Joyce Drive into Ross Smith Avenue has been provided in the Joyce Drive median. The widened median would accommodate a dedicated right turn lane, if required in the future.
3. The current design includes left-in, left-out slip lanes at the General Homes Drive, Joyce Drive and Ross Smith Avenue intersection. Roads and Maritime would continue to consult with ARTC regarding the provision of access to the Port Botany Freight Line easement from the General Holmes Drive cul-de-sac.

### **3.3.2 Wentworth Avenue underpass and twin rail bridges**

#### *Comment description*

Suggested that the proposal lower the rail line and bridges to reduce impact on operational airspace.

#### *Response*

Roads and Maritime has considered lowering the rail line and bridges to reduce the impact of the proposal on operational airspace. Lowering the rail line would require lowering the Wentworth Avenue underpass, pumping station and the Wentworth Avenue/Botany Road intersection. This would result in additional construction and operational impacts including:

- Safety concerns: Lowering the Wentworth Avenue underpass and Wentworth Avenue/Botany Road intersection further would result in steep grades in the underpass due to the short length of road between Botany Road and General Holmes Drive. The vertical road alignment is constrained by the protection structure needed for the High Pressure Gas main and maintaining the existing alignment of Botany Road. Underpass road grades that are steeper than proposed in the REF would obstruct the line of sight distance for motorists. This would be an unacceptable safety outcome for the underpass.
- Excavation: Lowering the rail line and bridges would require additional excavation for the Wentworth Avenue underpass. The amount of excavation required to facilitate lowering the rail line and bridges would be proportional to the amount of lowering required. The additional excavation would further intersect the water table, resulting in further impacts to groundwater flows and levels, requiring more substantial dewatering during construction. During operation, the pumping requirement would be increased as water need to be pumped from a lower elevation and a deeper pumping station would be required.
- Further change to drainage patterns: As discussed in Section 4.3.2 of the REF, the Wentworth Avenue underpass would form a low point within the proposal area, and would be prone to flooding. A deeper, lower underpass for Wentworth Avenue would provide a larger void where floodwaters can accumulate. Further lowering both the Wentworth Avenue underpass and Wentworth Avenue/Botany Road intersection would encourage surface flow along Botany Road to enter the underpass.

The Civil Aviation Safety Authority (CASA) would be required to approve the proposal's impact on operational airspace.

### **3.3.3 Ancillary facilities**

#### *Comment description*

Requested to be provided with stockpiling details before construction begins.

#### *Response*

Use of leased land and any conditions associated with the use of that land would be agreed between SACL and Roads and Maritime during preparation of the lease agreement. Details on stockpiling would be agreed with SACL during lease negotiations.

### **3.3.4 Remediation of land**

#### *Comment description*

Requested that details of remediation of land be provided before construction begins.

#### *Response*

Use of leased land and any conditions associated with the use of that land would be agreed between SACL and Roads and Maritime during preparation of the lease agreement. Details on the remediation of land and the timing of remediation activities would be agreed with SACL during lease negotiations.

### **3.3.5 Relocation of assets**

#### *Comment description*

Expressed concern that a site for the relocation of an Ascot Lodge advertising structure on General Holmes Drive has not been identified in the REF. Stated that this should be carried out at cost to Roads and Maritime.

#### *Response*

As noted in the urban design principles (refer to Section 4.2.3 of the REF), Roads and Maritime would maintain views to advertising in the road corridor and would be responsible for the relocation of any affected structures. Specifically, Roads and Maritime would investigate locations for a relocated sign for the Ascot Lodge advertising structure during detailed design. A new site for the sign would be selected by Roads and Maritime in consultation with SACL.

### **3.3.6 Integration of the proposal with other projects**

#### *Comment description*

Expressed concern that the proposal does not integrate with the T2/T3 Ground Access Solution and Hotel Major Development Plan and the Airport North precinct – WestConnex enabling works. Requested additional information to be provided.



## *Response*

Roads and Maritime considered the integration of the proposal with other projects during the options process. Roads and Maritime would continue to consider the integration of the proposal with the T2/T3 Ground Access Solution and Hotel Major Development Plan and the Airport North precinct – WestConnex enabling works projects during detailed design of the proposal (once details of these projects are available).

Roads and Maritime would continue consultation with SACL during detailed design to ensure the transition between the Airport North precinct – WestConnex enabling works and the T2/T3 Ground Access Solution and Hotel Major Development Plan is appropriate.

## **3.4 Statutory and planning approvals**

### **3.4.1 Commonwealth legislation**

#### *Comment description*

Stated that planning consent and building permit submissions are required in accordance with the *Airports Act 1996*. Requested the proposal be assessed against each of the National Airports Safeguarding Framework (NASF) guidelines and referred to CASA for determination regarding any proposed intrusions into the Obstacle Limitation Surface (OLS).

Suggested further reference to legislation is necessary to justify the use of state legislation for the assessment of environmental impacts.

#### *Response*

The planning and approval framework for the proposal is outlined in Section 5.1 of the REF. Section 5.1 of the REF outlines the approvals and consent required from SACL and the Airport Building Controller before construction begins. Roads and Maritime would carry out comprehensive assessment against each of the NASF guidelines before construction. Roads and Maritime understand that a referral to CASA would be required for their determination regarding any proposed intrusions into the OLS (refer to Section 5.2.1 of the REF).

In response to SACL comments, Roads and Maritime have provided a more detailed overview of relevant Commonwealth legislation in **Section 4.3**.

### **3.4.2 Policies and guidelines**

#### *Comment description*

1. Requested that the T2/T3 Ground Access Solution and Hotel Major Development Plan, as well as the Sydney Airport Master Plan, be referenced in the REF.
2. Requested that reference to the superseded Sydney Airport Environment Strategy 2010-2015 should also be amended in the REF.

#### *Response*

1. **Section 4.1** provides an overview of strategic planning and policy framework which may be relevant to the proposal, in addition to that identified in Chapter 2

of the REF. This section includes reference to SACL's approved Master Plan 2033 Appendix A Five Year Ground Transport Plan and the T2/T3 Ground Access Solution and Hotel Major Development Plan.

2. Correct referencing to the Sydney Airport Environment Strategy 2013-2018 has been addressed in **Section 4.3.2.1**.

## **3.5 Land transport and access**

### **3.5.1 Network performance**

#### *Comment description*

Expressed concern that traffic modelling for the proposal only supports the opening year. Requested that cumulative traffic modelling of the proposal area and adjacent intersections at terminal entrance roads be carried out for the period five years after the project is opened to traffic.

#### *Response*

As discussed in Section 7.1.1 of the REF, the traffic model was developed to assess the impact of the proposal at both a strategic network and local traffic level. This approach is considered to be more realistic than analysis over the direct project area only. Accordingly, the extent of the network traffic model was wider than the proposal area, encompassing areas between the southern edge of the Sydney central business district, Botany Bay, Anzac Parade and the Princes Highway.

The traffic model identified that the broader network would reach capacity by 2018. This would constrain traffic from entering the proposal area, and therefore artificially reduce the vehicle numbers in the proposal area. Accordingly, traffic projections beyond 2018 would not accurately reflect the traffic situation and therefore have not been presented.

As a result, the traffic modelling results up until 2018 are considered to provide the most accurate indication of traffic performance within the local road network for the proposal in comparing the 2013 existing and 2018 project opening scenarios.

With regards to cumulative traffic modelling of nearby intersections, the study area extent for the traffic model includes the intersections directly next to the terminal entrance roads. As information from future projects within or close to the proposal area was unavailable, these future projects have not been considered within the traffic model. The concept design has, however, considered potential traffic requirements at these intersections in consultation with SACL.

## **3.6 Airport operations**

### **3.6.1 Impacts of the rail bridges on airport operations**

#### *Comment description*

Expressed concern regarding the construction and operational impacts of the proposed railway bridges on Sydney Airport. Suggested that Roads and Maritime must consider reducing permanent intrusions into the OLS.

## *Response*

Section 7.2.3 of the REF has considered the construction and operational impacts of the railway bridges on permanent airport operations. It is confirmed that Roads and Maritime assets would not breach the OLS during operation.

Roads and Maritime have also considered lowering the rail bridges as part of the proposal, in response to SACL's request (refer to **Section 3.3.2**).

The removal of the level crossing at General Holmes Drive would allow trains to pass through the proposal area at faster speeds. The duration of transient breaches to the OLS would be reduced as a result of the proposal. Accordingly, the proposal is considered to result in a positive impact to permanent airport operations by reducing the periods of freight trains breaches of the OLS. Any other reductions in permanent OLS breaches are not the responsibility of Roads and Maritime.

## **3.7 Noise and vibration**

### **3.7.1 Construction noise impacts**

#### *Comment description*

1. Requested that a comprehensive noise mitigation strategy be developed that considers current and future hotel sites in the Joyce Drive corridor, particularly with reference to planned night works. Stated that construction noise impacts on the Ibis Hotel should be considered.
2. Requested that Roads and Maritime carry out a cumulative noise assessment which considers construction works associated with the other projects nearby and identifies strategies for mitigation.

#### *Response*

1. During detailed design, Roads and Maritime would carry out further assessment of potential construction noise impacts. The detailed design of the proposal would further investigate the construction noise impacts including impacts on Airport buildings. The assessment would assess potential noise impacts at all potentially sensitive receivers within the proposal area, including current hotel sites and identify reasonable and feasible measures to mitigate any impacts.
2. The construction and operational noise and vibration assessment carried out by Wilkinson Murray (2014, 2015b) for the REF covers construction noise during night time periods. An additional noise impact assessment has been carried out to assess potential construction and operational noise impacts on the Ibis Hotel, located on Joyce Drive (Wilkinson Murray, 2014, 2015b). This assessment is summarised in **Section 5.1** and provided in full in **Appendix B**.  
**Section 4.5** provides a discussion regarding potential cumulative noise impacts of the proposal.

## **3.8 Hydrology**

### **3.8.1 Water body reference and land management boundaries**

#### *Comment description*

1. Requested that the REF be updated to include reference to Engine Pond East.

2. Requested the REF be updated to include reference to land management boundaries within the proposal area.

*Response*

1. Details regarding reference to Engine Pond East, Mill Ponds and Mill Pond are discussed further in **Section 4.7**.
2. Section 7.6.2 of the REF discusses water body management boundaries within the proposal area. The REF states that Sydney Water is responsible for Mill Pond upstream of the concrete weir (3.6 mAH, weir height derived from a flood study by SMEC (1992)) through to Gardeners Road, Mascot. The REF also states that SACL is responsible for managing the section of the Botany Wetlands known as Mill Pond, Engine Pond (east and west) and the Mill Stream (collectively known as the Mill Ponds or Sydney Airport Wetlands).

The Sydney Airport Environment Strategy 2013-2018 notes that SACL is responsible for managing the downstream sections of the Botany Wetlands. This includes the southern section of Mill Pond, Engine Pond East, Engine Pond West, and the Mill Stream (SACL, 2014).

**Section 4.6** provides a discussion regarding the reference to water bodies in the REF.

### **3.8.2 Groundwater management strategy**

*Comment description*

1. Stated that any groundwater discharged during construction and operation of the proposal into Ascot Drain would be into receiving waters managed by SACL.
2. Requested a detailed groundwater management strategy, which includes groundwater management and monitoring activities. Requested to be provided with the groundwater management strategy for approval.

*Response*

1. Roads and Maritime acknowledge that groundwater discharged during construction and operation of the proposal into the stormwater drain would be into receiving water managed by SACL. The groundwater management strategy for the proposal would be made available to SACL when completed.
2. The groundwater management strategy for the proposal would be prepared during detailed design and made available to SACL when completed. The detailed design would also investigate groundwater management and groundwater monitoring for the proposal area and any indirectly affected areas. The groundwater monitoring strategy would also provide detail about monitoring before and after construction within the vicinity of the Wentworth Avenue underpass.

### **3.8.3 Hydrology**

*Comment description* Stated that an additional hydrological study would be required to assess the impact of the proposal on the water table and local groundwater flows. Required further details of the drainage conditions upstream of Ascot Drain.

*Response*

Roads and Maritime would carry out further hydrology investigations as part of the detailed design. These investigations would consider in more detail surface water

flows within the proposal area, as well as drainage conditions upstream of the Ascot Drain.

### **3.9 Landscape character and visual amenity**

#### **3.9.1 Urban design strategy**

##### *Comment description*

1. Requested a detailed urban design and landscape strategy be prepared as part of the proposal considering:
  - The amenity, value and impact of landscaping to be removed
  - A design for replacing removed vegetation, while considering the impact on airport operations (ie appropriate height of vegetation).
2. Requested a landscaping audit and valuation to be carried out to account for any loss of vegetation. Requested to be provided with the urban design and landscape design strategy for approval.

##### *Response*

1. A detailed urban design and landscape strategy would be prepared as part of the detailed design of the proposal and would consider:
  - The impact of removing existing landscaping and its current amenity and value
  - Airport operational issues in the selection of replacement vegetation, roadside furniture and other urban design elements.
2. The landscape and urban design strategy would be made available to SACL for comment when it has been completed. Roads and Maritime would continue to consult with SACL regarding landscaping in the area between General Holmes Drive and the Port Botany Freight Rail Line.

### **3.10 Land use and property**

#### **3.10.1 Impacts to airport-leased land**

##### *Comment description*

1. Suggested the use of a memorandum of understanding (MOU) to facilitate the orderly use and transfer of land associated with the proposal between Roads and Maritime and SACL.
2. Noted that airport-leased land would be made available for the construction and operation of the Wentworth Avenue extension and Joyce Drive widening at no cost to the State Government (subject to agreement with the Commonwealth).

##### *Response*

1. Roads and Maritime agree that a comprehensive MOU would be beneficial for facilitating the transfer and use of land associated with the proposal. Roads and Maritime is in the process of consulting with SACL to agree on a MOU for the proposal.
2. Roads and Maritime acknowledge SACL's cooperation in the development of the

proposal. Roads and Maritime note that airport-leased land would be made available by SACL to the proposal at no cost to the State Government, subject to agreement with the Commonwealth Government.

### **3.10.2 Land uses and social infrastructure within the proposal area**

#### *Comment description*

Stated that Figure 7-18 in the REF incorrectly identifies Ascot Lodge as ‘unused land’.

#### *Response*

The land use and social infrastructure figure has been updated and included as **Figure 4-2**.

## **3.11 Socio-economic**

### **3.11.1 Impact to SACL infrastructure**

#### *Comment description*

Requested that airport infrastructure and assets (such as underground utilities, advertising signage structures and landscaping) affected by the proposal be restored and/or relocated with costs to be borne by Roads and Maritime.

#### *Response*

Any airport infrastructure and assets affected by the proposal would be restored and/or relocated by Roads and Maritime (refer to **Section 6.2**).

## 4 Addenda to the REF

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Roads and Maritime have made several addenda to the REF in response to comments raised by SACL (refer to **Chapter 3**). In addition, Roads and Maritime have refined the proposal area boundary. Addenda to the REF are discussed in further detail below.

### 4.1 Executive summary

The executive summary as presented in the REF outlines the justification of the proposal, as well as the options considered. In addition, the proposal would improve the road network and reduce traffic congestion within the proposal area. The proposal would improve travel times for vehicles travelling between Sydney Airport and Southern Cross Drive by up to 50 per cent in the morning peak period and up to 60 per cent in the evening peak period.

These improvements in network performance as a result of the proposal would also result in improved conditions for bus and taxi access between Sydney Airport and Southern Cross Drive.

### 4.2 Project description

#### 4.2.1 Refinement of the proposal area

Following the display of the REF, Roads and Maritime adjusted the proposal area to include about 400 metres of shared-use path along the south of Wentworth Avenue. The refined proposal area boundary is shown in **Figure 4-1**.

The potential environmental impacts of the shared-use path along the south of Wentworth Avenue have been assessed in Chapter 6 of the REF. As such, adjustment to the proposal area boundary does not require additional assessment in this report.

### 4.3 Strategic planning and policy framework

#### 4.3.1 Commonwealth legislation

As the proposal is partially located on Commonwealth land leased to SACL, relevant Commonwealth legislation does apply. This section provides an overview of Commonwealth legislation which may be relevant to the proposal, in addition to legislation already identified in Chapter 5 of the REF.

##### 4.3.1.1 Airports (Environmental Protection) Regulations 1997

#### **Noise**

The *Airports Act 1996* (Airports Act) is discussed in Section 5.2.1 of the REF. The *Airport (Environmental Protection) Regulations 1997* (Airport Environmental Protection Regulations), made under the Airports Act, provides for the management of activities which generate air, water or soil pollution or excessive noise on airport sites. The Airport Environmental Protection Regulations also aims to promote environmental management practices for activities carried out on airport land.

Section 2.03 of Schedule 4 of the Airport Environmental Protection Regulations provides the base criteria for noise from the operation of roads within airport land for

commercial and sensitive receivers. These criteria are consistent with the requirements of the NSW Road Noise Policy (DECCW, 2011) (refer to Section 7.3.1 of the REF). Accordingly, the NSW Road Noise Policy is considered appropriate for noise impact assessment for the areas of the proposal on Commonwealth land for both commercial and sensitive receivers.

Section 2.02 of Schedule 4 of the Airport Environmental Protection Regulations provides the base criteria for noise from construction activities on airport land for commercial and sensitive receivers. The NSW Interim Construction Noise Guideline (ICNG) (DECC, 2009) has more stringent criteria for the assessment of construction noise impacts. For the purposes of the proposal, the ICNG is considered the appropriate guideline to use for noise impact assessment on Commonwealth land for both commercial and sensitive receivers.

The NSW POEO Act also provides the framework by which environment protection licences (EPLs) are established and how they regulate noise emissions and impacts from scheduled activities (refer to Section 5.5.1 of the REF).

### **Contamination**

A review of the soil pollution criteria in the Airport Environmental Protection Regulations has identified that the recreational/open space criteria used in the REF for soil contamination (ie based on the National Environmental Protection (Assessment of Site Contamination) Measure 2013 (Site Contamination NEPM) is more stringent than the commercial/industrial criteria detailed in the Airport Environmental Protection Regulations. For this reason, and for the purposes of the proposal, the Site Contamination NEPM is considered the more appropriate guideline to use for the assessment of contamination on Commonwealth land.

#### **4.3.1.2 National Environmental Protection (Ambient Air Quality) Measure 1998**

The National Environmental Protection (Ambient Air Quality) Measure (Ambient Air Quality NEPM) outlines national standards for air pollutants including carbon monoxide, nitrogen dioxide, photochemical oxidants (as ozone), sulphur dioxide, lead and particles (as PM<sub>10</sub>).

In NSW the Environment Protection Authority (EPA) regulate air quality impacts in accordance with the POEO Act and associated Regulations. In terms of air quality assessment the EPA provide guidance and standards that are outlined in the NSW Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC 2005). The air quality standards included in the Approved Methods are consistent with the standards outlined in the Ambient Air Quality NEPM Act. Accordingly, it is considered appropriate to assess potential air quality impacts against these Approved Methods for the proposal.

The NSW POEO Act also provides the framework by which environment protection licences (EPLs) are established and how they regulate air quality emissions and impacts from scheduled activities (refer to Section 5.5.1 of the REF).

### **4.3.2 Policies and guidelines**

#### **4.3.2.1 Sydney Airport Environment Strategy 2013-2018**

Section 5.6.2 of the REF discusses the proposal's consistency with the Sydney Airport Environment Strategy 2013-2018. Section 7.11 and Section 2.2.7 of the REF refer to a previous version of the Sydney Environment Strategy (applicable for the



dates 2010-2015). These references should refer to the Sydney Airport Environment Strategy 2013-2018.

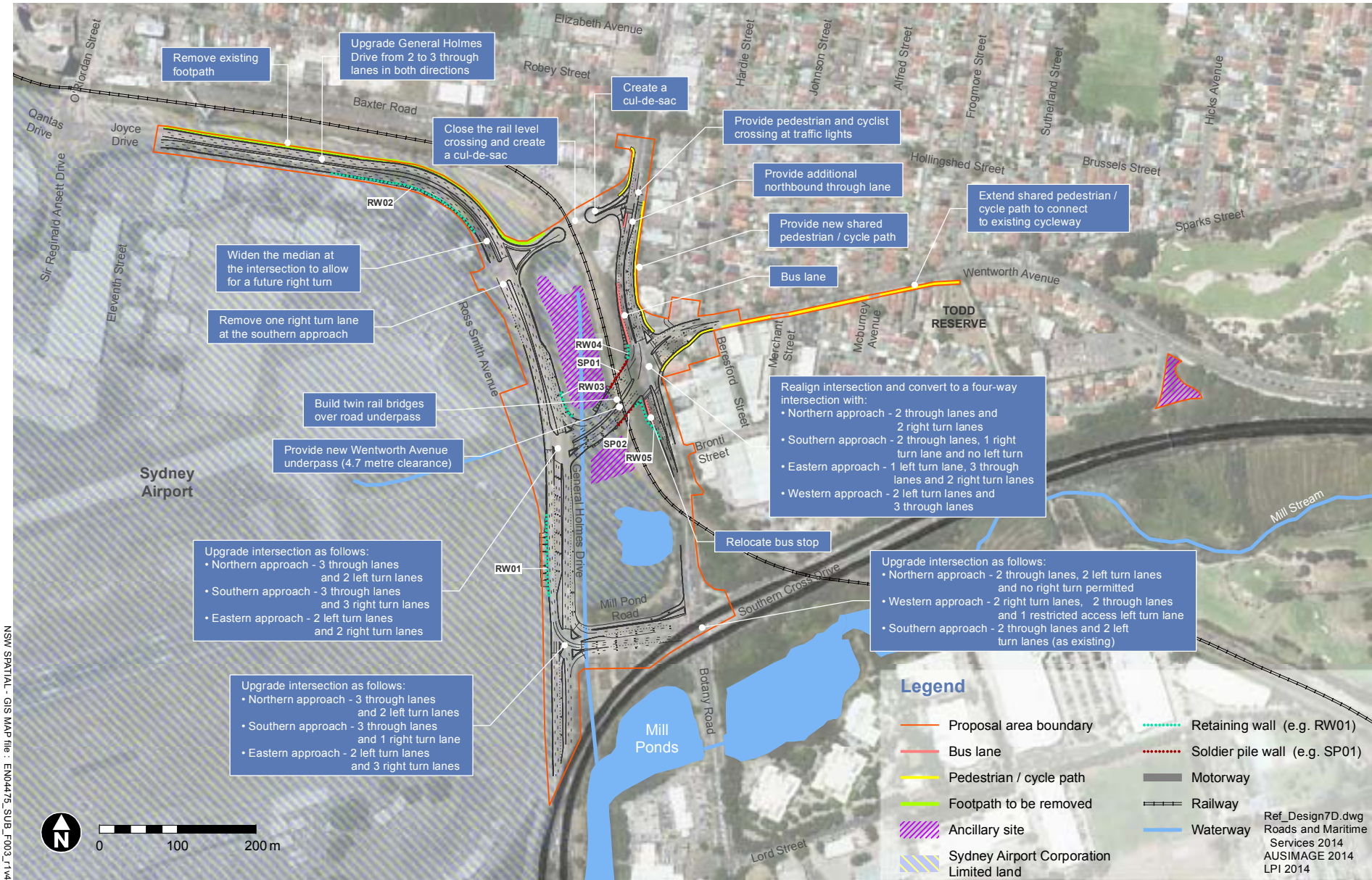
#### 4.3.2.2 T2/T3 Ground Access Solutions and Hotel Major Development Plan

The T2/T3 Ground Access Solutions and Hotel Major Development Plan (the Plan) outlines construction planned for Sydney Airport to accommodate predicted passenger growth. The Plan includes the extension of Seventh Street, connection of the P2 and P3 car parks, construction of the multi-level Ground Transport Interchange, reconfiguration of Sir Reginald Ansett Drive and Shiers Avenue, reconfiguration of Qantas Drive and construction of a hotel. Construction of this project is anticipated to commence in 2015 and take about 36 months to complete.

The REF for the proposal was prepared with consideration to Sydney Airport T2/T3 Ground Access Solutions and Hotel Preliminary Draft Major Development Plan, as discussed in Section 4.2.3 and Section 7.16 of the REF.

#### 4.3.2.3 Appendix A: Five Year Ground Transport Plan

Section 5.6.1 of the REF discusses the Sydney Airport Master Plan 2033. Appendix A of the Master Plan details the Five Year Ground Transport Plan. The Plan specifically identifies works proposed at the T1, T2 and T3 terminals, as well as the North and South East Sectors. A review of these plans has found that the proposal is consistent with the objectives of the Sydney Airport Master Plan 2033 (refer to Section 2.2.6 of the REF).



**Figure 4-1** Refined proposal area boundary

## 4.4 Existing roads and infrastructure

### 4.4.1 Sydney Airport

#### 4.4.1.1 Definitions and terminology

The Obstacle Limitation Surface (OLS) is defined in Section 2.3.7 of the REF. The OLS is a series of surfaces in the airspace surrounding an airport. It defines the airspace to be protected for aircraft operating during the initial and final stages of flight, or manoeuvring in the vicinity of the airport (SACL, 2014) (refer to Figure 4-9 of the REF).

The Procedure for Air Navigational Services-Aircraft Operations (PANS-OPS) is defined in Section 2.3.7 of the REF. PANS-OPS are established to protect those stages of take-off, landing or manoeuvring when aircraft are operating in non-visual (instrument) conditions (SACL, 2014).

Regulation 6 of the *Airports (Protection of Airspace) Regulations 1996* defines the airspace above any part of either the OLS or the PANS-OPS surface of an airport as 'prescribed space'. Prescribed airspace is considered to be in the interests of safety, efficiency or regularity of existing or future air transport operations.

## 4.5 Noise and vibration

In addition to impacts identified in Section 7.3.4 of the REF, the proposal may result in cumulative noise impacts during construction. Potential cumulative noise impacts may occur in situations where the proposal is constructed concurrently with other nearby developments. This would be due to the operation of multiple construction sites, potentially resulting in additional construction noise impacts and reductions in local amenity. As discussed in Section 7.16 of the REF, there are a number of developments anticipated to be constructed near the proposal, however the details and timing of these projects are currently unknown.

The potential for such impacts would need to be managed by the construction contractor once the timing of other developments becomes known. Roads and Maritime is continuing to consult with SACL regarding the potential for cumulative noise impacts due to concurrent construction of Roads and Maritime and SACL developments. The CEMP would include a process to review and update mitigation measures as new work begins or if complaints are received.

## 4.6 Non-Aboriginal heritage

The impact of the proposal on non-Aboriginal heritage items is discussed in Section 7.4 of the REF. Following the display of the REF, Roads and Maritime made refinements to property acquisition details (refer to **Section 4.8**). Consultation with identified that full acquisition of the Beckenham Memorial Church was preferable for the church operators due to the loss of the church hall and potential increase in operational noise. As a result, Roads and Maritime would carry out full property acquisition of the Beckenham Memorial Church (Lot 8/DP3280 and Lot 7/DP3280). This building has local heritage significance and is listed on the Botany Bay LEP (refer to Section 7.4 of the REF).

Roads and Maritime is investigating opportunities to reuse the Beckenham Memorial Church, and would work with Botany Bay City Council to maintain its heritage value, where possible.

## **4.7 Hydrology**

### **4.7.1 Reference to Mill Ponds**

As discussed in Section 7.5.1 of the REF, the main water body in the proposal area is the Mill Pond system which comprises the Mill Pond and Engine Pond, connected by Mill Stream (these are also known as Sydney Airport Wetlands). The Mill Ponds are located about 250 metres south of the proposed works and form part of the Botany Wetlands, a series of 11 interconnected ponds extending from Gardeners Road to Botany Bay. This system discharges south to Botany Bay via a channel approximately 750 metres in length which runs along Foreshore Road (Lesryk Environmental Consultants, 2013).

It should be noted that reference to Mill Ponds in the REF is also referred to as Engine Pond East by SACL. Ascot Drain (referred to as the stormwater channel in the REF), discharges into Engine Pond East. As outlined in the Sydney Airport Environment Strategy 2013-2018, Engine Pond West and Engine Pond East are divided by General Holmes Drive. The Botany Wetlands flow through Engine Pond East and Mill Stream, however Engine Pond West is isolated from direct flow (SACL, 2014).

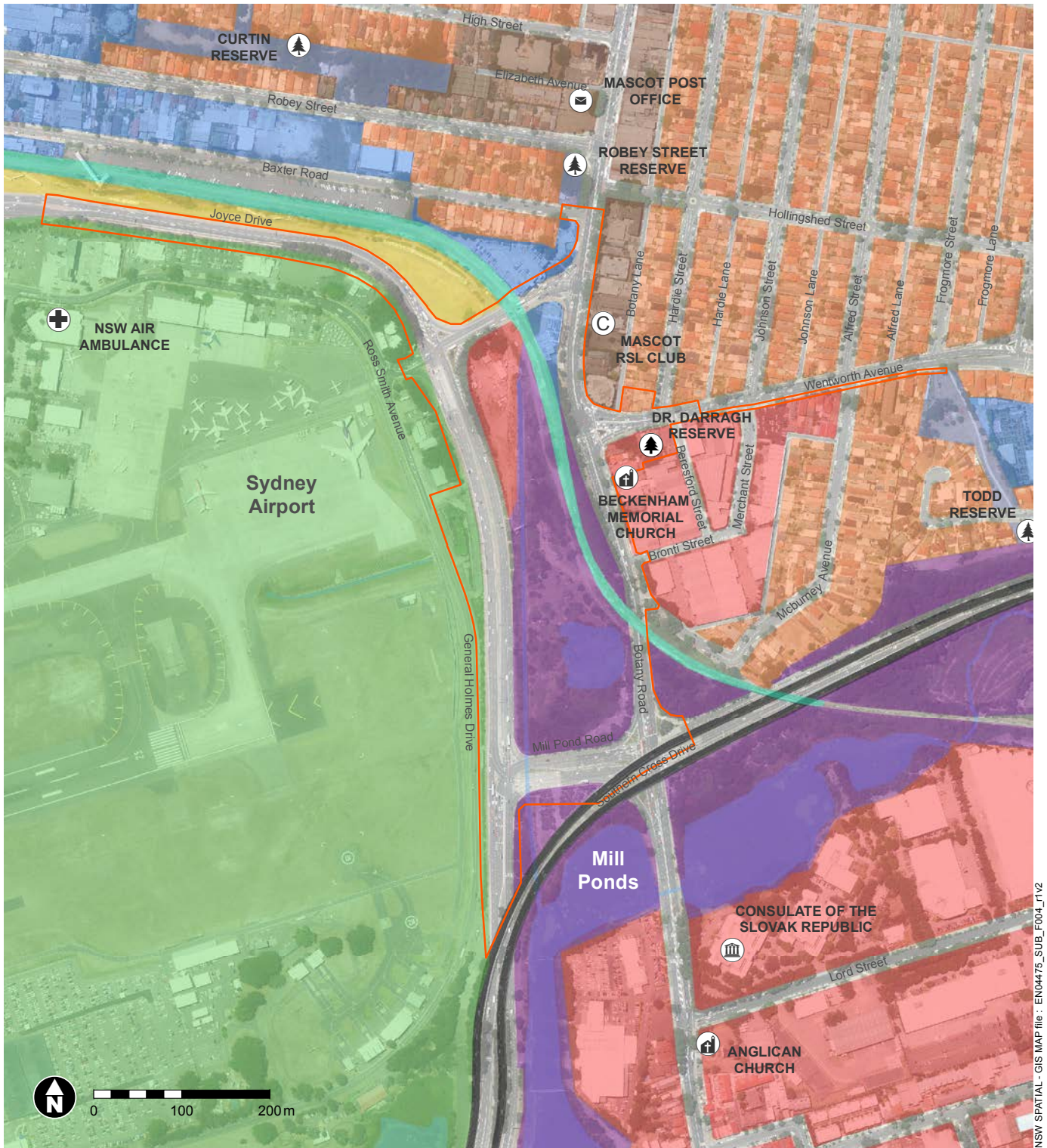
## **4.8 Land use and property**

### **4.8.1 Refinements to property acquisition details**

Details of property acquisition are outlined in Section 4.8 and Section 7.12 of the REF. Following the display of the REF, Roads and Maritime made revised property acquisition requirements. As discussed in **Section 4.6**, the proposal would require the full acquisition of the Beckenham Memorial Church (Lot 8/DP3280 and Lot 7/DP3280). In addition, the proposal would no longer require the full acquisition of 1 Wentworth Avenue and 3 Wentworth Avenue (Lot 1/DP455496). No additional assessment is required.


















### **4.8.2 Social infrastructure**

Social infrastructure located within or near the proposal and land use types are shown in **Figure 4-2**.



**Figure 4-2** Land use and social infrastructure

**Legend**

- |  |   |  |  |
|--|---|--|--|
|  Proposal area boundary |  Ambulance Station |  Advertising corridor             |  Public recreation      |
|  Motorway               |  Club              |  Airport infrastructure           |  Railway infrastructure |
|  |  Embassy           |  Commercial                       |  Residential            |
|  |  Park              |  Light industrial                 |  Unused land            |
|  |  Place Of Worship  |  Mixed residential and commercial |  |
|  |  Post Office       |  |  |

## 5 Additional assessment

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### 5.1 Noise and vibration

The extent and magnitude of potential impacts of the proposal in terms of noise and vibration are assessed in the Construction Noise and Vibration Impact Assessment (Wilkinson Murray, 2014) and Operational Noise Impact Assessment (Wilkinson Murray, 2015b), which have been summarised in Section 7.3 of the REF. An additional noise assessment has been prepared to assess potential noise impacts of the proposal on the Ibis Hotel (Wilkinson Murray, 2015a). A summary of the assessment is provided in this section and provided in full in **Appendix B**.

#### 5.1.1 Policies and guidelines

Policies and guidelines relevant to the proposal are described in Section 7.3.1 of the REF.

#### 5.1.2 Existing environment

The existing noise environment of the proposal area is described in detail in Section 7.3.2 of the REF.

#### 5.1.3 Assessment criteria

The Road Noise Policy (RNP) and Interim Construction Noise Guideline (ICNG) refers to the *Australian/New Zealand Standard AS/NZS 2107:2000 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors* (AS/NZS 2107:2000) for assessment criteria relevant to hotels.

The AS/NZS 2107:2000 recommends that the following internal noise limits are not exceeded in hotels located near major roads:

- Sleeping Areas -  $L_{Aeq}$  35 dB(A) satisfactory and  $L_{Aeq}$  40 dB(A) maximum.

The assessment adopted an external noise criterion of  $L_{Aeq}$  75 dBA for the construction and operation of the proposal.

#### 5.1.4 Construction noise assessment

##### 5.1.4.1 Methodology

The methodology of the construction noise assessment is described in Section 7.3.4 of the REF.

##### 5.1.4.2 Potential impacts summary

As shown in **Table 5-1**, the proposal would not exceed the adopted external noise criteria during most of the construction period. The only exceedance is expected during Joyce Drive widening, which is predicted to result in an exceedance of up to 11 dB at the Ibis Hotel. The CNVMP and noise assessments carried out as part of the detailed design would consider these potential noise impacts further (refer **Section 6.2**).

**Table 5-1 Worst case predicted  $L_{Aeq, 15min}$  construction noise levels**

Construction activity	Predicted $L_{Aeq, 15min}$ (dBA)	External noise criteria $L_{Aeq}$ (dBA)	Compliance	Exceedance
Joyce Drive widening	86	75	No	11
General Holmes Drive widening	59	75	Yes	Nil
Botany Road intersection upgrade	56	75	Yes	Nil
Rail bridges	53	75	Yes	Nil
Finalisation works	57	75	Yes	Nil

## 5.1.5 Operational noise assessment

### 5.1.5.1 Methodology

The methodology of the operational noise assessment is described in Section 7.3.5 of the REF.

### 5.1.5.2 Potential impacts summary

As shown in **Table 5-2**, the proposal would not exceed the adopted external noise criteria during operation. Marginal changes in traffic noise levels (<1 dB) are predicted between 2013 and 2018. It is considered unlikely the Ibis Hotel would experience any noticeable change in perceived external or internal noise levels during the operation of the proposal.

**Table 5-2 Year 2013 'No Build' and Year 2018 'Build' Predicted  $L_{Aeq, Period}$  Traffic Noise Levels**

Receiver	$L_{Aeq, Period}$ (dBA)		$L_{Aeq, Period}$ (dBA)		External noise criteria $L_{Aeq, Period}$ (dBA)		Compliance	
	Year 2013 'No Build'		Year 2018 'Build'					
	Day	Night	Day	Night	Day	Night	Day	Night
Ibis Hotel	71	66	72	67	75	75	Yes	Yes

## 5.1.6 Safeguards and management measures

No additional safeguards and management measures for potential noise impacts are proposed.

## 6 Environmental management

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The REF for the Airport East precinct – WestConnex enabling works identified the framework for environmental management, including management and mitigation measures that would be adopted to avoid or reduce environmental impacts (refer to Chapter 7 of the REF).

After consideration of the comments raised in the public submissions and changes to the proposal, Roads and Maritime has revised the management and mitigation measures in the REF. The key changes include:

- A commitment from Roads and Maritime to continue to investigate optimising the cycleway within the proposal area. This will include reducing the number of crossings, where feasible
- A commitment from Roads and Maritime to continue to consult with ARTC regarding the provision of access to the Port Botany Freight Line easement from the General Holmes Drive cul-de-sac
- A commitment from Roads and Maritime to investigate the cost and benefit associated with upgrading the left turn slip lane to a dedicated left turn lane at Southern Cross Drive onto Botany Road. This will include consideration of alternate linemarking strategies on Southern Cross Drive westbound to reduce the number of through vehicles queuing in the left turn lane and allow additional vehicles to access the current left turn lane
- A commitment from Roads and Maritime to provide SACL with further detail regarding the adjustment, relocation and/or protection of utility services
- A commitment from Roads and Maritime to consider the integration of the proposal with other projects, such as the T2/T3 Ground Access Solution and Hotel Major Development Plan and the Airport North precinct – WestConnex enabling works (in consultation with SACL)
- A commitment from Roads and Maritime to investigate locations for a relocated sign for the Ascot Lodge advertising structure during detailed design. The new site for the sign will be selected by Roads and Maritime in consultation with SACL
- A commitment from Roads and Maritime to continue to consult with SACL regarding:
  - The potential for cumulative noise impacts due to concurrent construction of Roads and Maritime and SACL developments
  - Landscaping in the area between General Holmes Drive and the Port Botany Freight Rail Line
  - Details of the MOU for the proposal
  - The use of leased land and any conditions associated with the use of that land during preparation of the lease agreement. Details on stockpiling and the remediation of land will be agreed with SACL during lease negotiations.
- A commitment from Roads and Maritime to provide SACL with the landscape and urban design strategy and groundwater management and monitoring plan for comment
- Additional mitigation measures to manage the impacts of the proposal on noise and vibration, land use and property, hydrology, landscape character and visual amenity, socio-economic issues.

Should the proposal proceed, environmental management will be guided by the framework and measures outlined below.



## 6.1 Environmental management plans (or system)

The proposal includes a number of safeguards and management measures to minimise adverse environmental and social impacts (refer to Chapter 6 of the REF). Should the proposal proceed, these measures would be incorporated into the detailed design and applied during construction and operation.

These safeguards and management measures would be contained in a Project Environmental Management Plan (PEMP) and a Contractor's Environmental Management Plan (CEMP). These two plans would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation.

The plans will be prepared before construction of the proposal and must be reviewed and certified by the Roads and Maritime Services Environmental Officer, Sydney Region, before any on-site works can begin. The CEMP would be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP and PEMP would be developed in accordance with the specifications set out in the QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan) and the QA Specification G40 – Clearing and Grubbing.

## 6.2 Summary of safeguards and management measures

Environmental safeguards outlined in this document would be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised in **Table 6-1**.

Changes made to the previous safeguards and management measures are identified in *blue italicised text* in **Table 6-1**.

**Table 6-1 Summary of site specific environmental safeguards**

No.	Impact	Environmental safeguards	Responsibility	Timing
<b>General</b>				
1	General	All environmental safeguards will be incorporated in the following documents: <ul style="list-style-type: none"> <li>• Project Environmental Management Plan</li> <li>• Detailed design</li> <li>• Contract specifications for the proposal</li> <li>• Contractor's Environmental Management Plan.</li> </ul>	Project manager	Pre-construction
2	General	A risk assessment will be carried out in accordance with the Roads and Maritime Audit Pack and Operations and Services Directorate (OSD) risk assessment procedures to determine an audit and inspection program for the project. The recommendations of the risk assessment will be implemented. A review of the risk assessment will be carried out after the initial audit or inspection to evaluate if the level of risk chosen for the project is appropriate. Any work for the proposal and covered by this REF may be subject to environmental audit(s) and/or inspection(s) at any time during their duration.	Project manager and regional environmental staff	Pre-construction  After first audit
3	General	The environmental contract specification G36 – Environmental Protection (Management System) will be forwarded to the Roads and Maritime Senior Environmental Officer for review at least 10 working days before the tender stage. A contractual hold point will be maintained until the CEMP is reviewed by the Roads and Maritime Senior Environmental Officer.	Project manager	Pre-construction
4	General	The Roads and Maritime Services Project Manager will notify the Roads and Maritime Services Environmental Officer, Sydney Region, at least 5 days before work begins.	Project manager	Pre-construction
5	General	All businesses and residences likely to be affected by the proposal will be notified at least 5 working days before the proposed activities begin.	Project manager	Pre-construction
6	General	The contractor will provide environmental awareness training to all field personnel and subcontractors.	Contractor	Pre-construction and during construction as required.
<b>Transport</b>				
TR-1	General traffic impacts	A Traffic Management Plan (TMP) will be prepared as part of the Construction Environmental Management Plan (CEMP). The TMP will be prepared in accordance with Roads and Maritime's Traffic Control at Work Sites (RTA, 2010), Australian Standard AS1742 and the worksite manual Roads and Maritime Specification G10. The TMP will outline: <ul style="list-style-type: none"> <li>• Traffic controls to regulate traffic movements and minimising traffic switching</li> </ul>	Construction contractor	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> <li>• Coordination of: <ul style="list-style-type: none"> <li>– General traffic flows at major construction work areas, such as the tie-ins for the Wentworth Avenue extension</li> <li>– Delivery of construction materials and movement of construction plant and equipment to and from the site to limit traffic delays</li> <li>– Other Roads and Maritime roadwork and any work by other agencies that affect traffic flow</li> <li>– Schedules, abnormal loads and other specific aspects of transport with transport operators</li> <li>– Consultation with local councils to identify, evaluate and document alternative routes</li> <li>– Incident response with emergency services.</li> </ul> </li> <li>• Maintenance of continuous, safe and efficient movement of traffic for both the public and construction crew</li> <li>• Haulage routes and access arrangements to minimise impacts on local routes</li> <li>• Construction traffic zones around work areas</li> <li>• Access provisions for local roads and properties</li> <li>• Maintenance of pedestrian access</li> <li>• Provision for appropriate warning and signposting</li> <li>• Requirements and methods to consult with and inform the local community of impacts on the local road network and traffic, as well as impacts on individual property access.</li> </ul> <p>A Vehicle Movement Plan will be prepared as part of the overall TMP. The Vehicle Movement Plan will assess construction-related heavy vehicle movements per shift into and out of the construction sites, and provide guidelines for limiting impacts on traffic using the road network.</p>		<p>Pre-construction</p> <p>Pre-construction</p>
TR-2	Impact to traffic from construction site access	<p>All access points to the construction site and site roads will:</p> <ul style="list-style-type: none"> <li>• Have safe intersection sight distance</li> <li>• Accommodate the turning movements of the largest heavy vehicles</li> <li>• Provide painted median treatments for vehicle delineation</li> <li>• Provide suitable intersection layouts.</li> </ul>	Construction contractor	Construction
TR-3	Impact on access to bus stops during construction	Local bus operators will be consulted during detailed design regarding location and provision of access to bus stops during construction.	Roads and Maritime	Detailed design
TR-4	Building rail	Roads and Maritime will consult with Port Botany and ARTC during detailed	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
	bridges during scheduled rail possessions	design to confirm that the proposal will avoid disturbance and impact on operations during construction where practicable.		
TR-5	Impact on access for emergency services	Consultation with emergency service authorities will be carried out during development of the detailed design including with NSW Fire Rescue.	Roads and Maritime	Detailed design
TR-6	Impact on pedestrian and cyclist access during construction	Pedestrian and cyclist access will be maintained throughout construction. Appropriate signage communicating diversion routes to pedestrians and cyclists will be displayed during construction. Advance notification will be provided of any construction works that affect pedestrians and cyclists.	Construction contractor	Construction
TR-7	Impact on property access	Vehicular property access will be maintained including at places of worship and to all commercial premises. Should property access be affected by the proposal, residents will be consulted before any work begins.	Construction contractor	Construction
TR-8	Impact on access to bus stops	The community will be provided with ongoing updates on locations and access to bus stops during the construction period to ensure that disruption is minimised.	Construction contractor/ Roads and Maritime	Construction
<b>TR-9</b>	<b><i>Alternate linemarking strategies</i></b>	<b><i>Roads and Maritime will consider alternate linemarking strategies on the Southern Cross Road off-ramp (westbound).</i></b>	<b><i>Roads and Maritime</i></b>	<b><i>Detailed design</i></b>
<b>TR-10</b>	<b><i>Dedicated left turn lane from Southern Cross Drive onto Botany Road</i></b>	<b><i>Roads and Maritime will confirm the viability of upgrading the left turn slip lane on Southern Cross Drive to a dedicated left turn lane at the intersection with Botany Road (southbound).</i></b>	<b><i>Roads and Maritime</i></b>	<b><i>Detailed design</i></b>
<b>TR-11</b>	<b><i>Optimisation of the cycleway</i></b>	<b><i>Roads and Maritime will continue to investigate optimising the cycleway within the proposal area, including reducing crossings where feasible.</i></b>	<b><i>Roads and Maritime</i></b>	<b><i>Detailed design</i></b>
<b>TR-12</b>	<b><i>Access to Port Botany Freight Line easement from the General Holmes Drive cul-de-sac</i></b>	<b><i>Roads and Maritime will continue to consult with ARTC regarding the provision of access to the Port Botany Freight Line easement from the General Holmes Drive cul-de-sac.</i></b>	<b><i>Roads and Maritime</i></b>	<b><i>Detailed design</i></b>
<b>TR-13</b>	<b><i>Austrroads Guide to Road Design (2009)</i></b>	<b><i>Cyclist facilities for the proposal will be designed with reference to the Austrroads Guide to Road Design (2009)</i></b>	<b><i>Roads and Maritime</i></b>	<b><i>Detailed design</i></b>

No.	Impact	Environmental safeguards	Responsibility	Timing
<b>Airport operations</b>				
AO-1	General impacts on airport operations	Roads and Maritime will continue to consult with SACL and Air Services Australia before and during construction of the project regarding any potential impacts on airport operations.	Roads and Maritime	Detailed design
AO-2	Construction impacts on airport operations	The CEMP will include an Airport Operations Management Plan to ensure that airport operations are not affected by construction of the proposal. This plan will include (as a minimum): <ul style="list-style-type: none"> <li>• Maps indicating areas of permitted disturbance within Sydney Airport land</li> <li>• Communication protocol with Sydney Airport and representatives, outlining frequency and content of updates</li> <li>• Complaints procedure.</li> </ul>	Roads and Maritime/ Construction contractor	Pre-construction
<b>AO-3</b>	<b><i>Integration of the proposal with other projects</i></b>	<b><i>Roads and Maritime will consider the integration of the proposal with the T2/T3 Ground Access Solution and Hotel Major Development Plan and the Airport North precinct – WestConnex enabling works projects. Roads and Maritime will continue to consult with SACL to ensure the transition between the Airport North precinct – WestConnex enabling works and the T2/T3 Ground Access Solution and Hotel Major Development Plan is appropriate.</i></b>	<b><i>Roads and Maritime</i></b>	<b><i>Detailed design</i></b>
<b>Noise and vibration</b>				
NV-1	Noise and vibration impacts on sensitive receivers	During the detailed design stage of the proposal, further investigations of potential noise impacts and all feasible and reasonable mitigation options will be carried out for affected receivers in accordance with the Road Noise Policy (DECCW 2011) and Roads and Maritime's Environmental Noise Management Manual Practice Note 4 (RTA 2001).	Roads and Maritime	Detailed design
NV-2	Noise and vibration impacts on sensitive receivers during construction	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared as part of the CEMP. The CNVMP will include (as a minimum): <ul style="list-style-type: none"> <li>• A map indicating the locations of sensitive receivers</li> <li>• A quantitative noise assessment in accordance with the EPA Interim Construction Noise Guidelines (DECCW, 2009)</li> <li>• Management measures to minimise potential noise impacts</li> <li>• A risk assessment to determine construction activities likely to affect sensitive receivers</li> <li>• Mitigation measures to avoid noise and vibration impacts during construction activities</li> <li>• A process for assessing the performance of mitigation measures</li> <li>• A process for documenting and resolving issues and complaints</li> </ul>	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> <li>A construction staging program incorporating noise and vibration monitoring for sensitive receivers</li> <li>Identification in toolbox talks where noise and vibration management is required.</li> </ul>		
NV-3	General vibration during construction	Building condition surveys will be carried out for buildings identified in the CNVMP. A copy of the report will be sent to the landholder.	Construction contractor	Pre-construction
NV-4	General vibration during construction	<p>A vibration assessment will be prepared and included in the NVMP. The vibration assessment will include (as a minimum):</p> <ul style="list-style-type: none"> <li>Identification of potentially affected properties/receivers</li> <li>A risk assessment to determine the potential for discrete work activities to affect receivers</li> <li>A map indicating the locations considered likely to be impacted and those requiring building condition surveys</li> <li>A monitoring program</li> <li>A process for assessing mitigation measures</li> <li>A process for resolving issues and conflicts, including additional noise and vibration monitoring where required.</li> </ul>	Construction contractor	Pre-construction
NV-5	Noise impacts on sensitive receivers from operation of stockpile and compound sites	Construction compound layout will be arranged so that primary noise sources are at a maximum distance from sensitive receivers (primarily residential receivers), with solid structures (sheds and containers) placed between sensitive receivers and noise sources (and as close to the noise sources as is practical).	Construction contractor	Pre-construction Construction
NV-6	Noise impacts from construction machinery	Compressors, generators, pumps and any other fixed plant will not be located near residences where possible	Construction contractor	Construction
NV-7	Noise and vibration induction	An environmental induction program will be developed to include specific noise and vibration awareness training.	Construction contractor	Construction
<b>NV-8</b>	<b>Construction noise impacts on Airport buildings</b>	<b>Detailed design will further investigate construction noise impacts, including impacts on sensitive receivers, Airport buildings, and current hotel sites. Reasonable and feasible mitigation measures will be identified.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
<b>NV-9</b>	<b>Noise mitigation</b>	<b>Roads and Maritime will consider noise mitigation at the church on Botany Road and a residence of Hardie Street, during detailed design. In addition, receivers in the proposal area which currently experience exceedances of the NSW Road Noise Policy (RNP) (DECCW, 2011) will be considered for noise mitigation in accordance with the provisions of the Noise Mitigation Guidelines (Roads and Maritime, 2014). Properties which</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>

No.	Impact	Environmental safeguards	Responsibility	Timing
		<i>qualify for noise mitigation treatment will be contacted by Roads and Maritime during detailed design.</i>		
<b>Non-Aboriginal heritage</b>				
NA-1	Landscaping to improve visual amenity of Beckenham Memorial Church	Landscaping surrounding the Beckenham Memorial Church will be investigated during detailed design in consultation with church owners and heritage officers from Botany Bay City Council.	Roads and Maritime	Detailed design
NA-2	Removal of heritage relics	An exception under Section 139 of the Heritage Act will be obtained for impacts to identified relics within the proposal area, if required.	Roads and Maritime	Pre-construction
NA-3	Impact to heritage items	A condition survey will be carried out before the start of work by a qualified contractor and a building condition report prepared for nearby heritage items which may experience indirect impact from construction, including Beckenham Memorial Church.	Roads and Maritime	Pre-construction
NA-4	General impact to heritage	A Non-Aboriginal Heritage Management Plan will be prepared and included in the CEMP. The plan will include but not limited to: <ul style="list-style-type: none"> <li>• A map identifying locations of heritage items (including curtilages) which are to be protected and those which are to be destroyed</li> <li>• Identification of potential impacts to heritage items due to construction</li> <li>• Implementation of mitigation measures to protect identified heritage items</li> <li>• A stop works procedure in the event of actual or suspected potential harm to a heritage item</li> <li>• Requirement to comply with Roads and Maritime Standard Management Procedure: Unexpected Archaeological Finds (2012).</li> </ul>	Roads and Maritime	Pre-construction
NA-5	Disturbance, removal or demolition of non-Aboriginal heritage items	A photographic archival recording will be made of the following items before any disturbance or demolition, in accordance with OEH guidelines: <ul style="list-style-type: none"> <li>• House (house and allotment), 1289 Botany Road</li> <li>• House (house and allotment), 1291 Botany Road</li> <li>• Beckenham Memorial Church School Hall (hall and allotment), 1293 Botany Road</li> <li>• Beckenham Memorial Church (church frontage only), 1295 Botany Road</li> <li>• Mascot (Botany Road) Underpass (bridge and its approaches)</li> <li>• Sandstone kerb along Botany Road near Wentworth Avenue</li> <li>• Botany Road tram tracks.</li> </ul>	Roads and Maritime	Pre-construction
NA-6	Non-Aboriginal heritage	Non-Aboriginal heritage awareness training will be provided for all contractors and personnel before the start of construction to make aware of retained heritage	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
	awareness training	items within the vicinity of the works and required management measures and to ensure understanding of the procedure required to be carried out in the event of discovery of non-Aboriginal heritage materials, features or deposits, or the discovery of human remains.		
NA-7	Protection of non-Aboriginal heritage items from inadvertent damage	The following items will be temporarily fenced and appropriate signage displayed and/or noted on a plan as a heritage item to avoid indirect impacts or encroachment, where necessary: <ul style="list-style-type: none"> <li>• Mascot (Botany Road) Underbridge</li> <li>• Sandstone kerb and alignment pin at Botany Road, near McBurney Avenue</li> <li>• Botany Water Reserve</li> <li>• Mascot (O'Riordan Street) Underbridge</li> <li>• Electricity Substation 163, at 42 Wentworth Avenue</li> <li>• Commercial Building Group, 1209–1223 Botany Road</li> <li>• Single Storey Terrace Group, 1239–1245 Botany Road</li> <li>• House, 71 Frogmore Street</li> <li>• House, 87 Hardie Street</li> <li>• House, 90 Johnson Street.</li> </ul>	Roads and Maritime  Construction contractor	Pre-construction  Construction
NA-8	Discovery of non-Aboriginal heritage features or deposits	If at any time during construction of the project, non-Aboriginal heritage materials, features and/or deposits are found and are not covered by an issued approval (generally s139 excavation permit, exception or s60 approval or exemption) then the Roads and Maritime Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime 2013) will be followed.	Construction contractor	Construction
NA-10	Discovery of tram tracks and additional road fabric	A photographic archival recording will be made of additional road fabric or other unanticipated finds if found during construction. This will be carried out in accordance with Roads and Maritime's Standard Management Procedure: Unexpected Archaeological Finds (2012).	Construction contractor	Construction
NA-11	Rebuilding of Beckenham Memorial Church fence	The front boundary wall of Beckenham Memorial Church will be rebuilt in the same style and with similar materials as the existing wall, in consultation with church owners and heritage officers from Botany Bay City Council.	Construction contractor	Construction
<b>Biodiversity</b>				
BI-1	Potential impact to Coastal Freshwater Wetland TEC during	<ul style="list-style-type: none"> <li>• A buffer zone of 5 m will be established around the wetland to avoid physical impact</li> <li>• The area within the wetland buffer area will be rehabilitated as part of the proposal area, including weed control, landscaping and site rehabilitation works with locally indigenous species</li> </ul>	Construction contractor	Pre-construction, construction



No.	Impact	Environmental safeguards	Responsibility	Timing
	construction	<ul style="list-style-type: none"> <li>Relocate woody debris recovered from the construction footprint to the wetland buffer to provide shelter sites for the Green and Golden Bell Frog.</li> </ul>		
BI-2	Vegetation and habitat removal	<p>Pre-clearance surveys will be carried out by an experienced ecologist to:</p> <ul style="list-style-type: none"> <li>Identify and mark fauna habitat features and roosting sites (if any exist) to be protected during construction</li> <li>Confirm the presence of the Green and Golden Bell Frog and the level of management commitment required during construction</li> <li>Identify nearby habitats within the proposal area that are suitable for the release of fauna that may be encountered during the pre-clearing process or habitat removal</li> <li>Select appropriate locations for construction access tracks, ancillary facilities and construction areas in previously cleared and disturbed areas, wherever possible.</li> </ul>	Construction contractor	Pre-construction
BI-3	Vegetation and habitat removal	<p>A Biodiversity Management Plan (BMP) will be included in the CEMP. It will include:</p> <ul style="list-style-type: none"> <li>Procedures for a site walk with appropriate site personnel including Roads and Maritime representatives to confirm clearing boundaries and sensitive locations before work begins</li> <li>The exclusion zones to be installed before clearing, to avoid damage to native vegetation and fauna habitats and prevent the distribution of pests, weeds and disease. Temporary fencing, flagging tape or other appropriate method will be installed to indicate the limits of the exclusion fencing. The location of exclusion fencing will be identified on plans in the CEMP and the function and importance of the exclusion zones communicated to construction personnel</li> <li>Maps showing vegetation clearing boundaries, identifying drainage areas that run towards the Coastal Freshwater Wetland TEC</li> <li>A procedure to manage stormwater in the proposal to ensure that hydrology of the Coastal Freshwater Wetland TEC is maintained, including periodic drying to prevent colonisation by <i>Gambusia (Gambusia holbrooki)</i></li> <li>The establishment of a 5 m buffer area/ exclusion zone around the Freshwater Wetland TEC to avoid construction impacts on the TEC, as discussed in BI-1</li> <li>A detailed clearing process in accordance with the Roads and Maritime Biodiversity Guidelines (Roads and Maritime, 2011) including requirements of Guide 1, 2 4 and 9</li> <li>An unexpected threatened species finds procedure, as outlined in the Biodiversity Guidelines (RTA, 2011a)</li> </ul>	Construction contractor	Pre-construction, construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> <li>• Specific details for the re-establishment and rehabilitation of native vegetation on cut faces, batters, the wetland buffer and other areas disturbed during construction</li> <li>• Guidance for the relocation of woody debris from the construction footprint to the wetland buffer to provide shelter for the Green and Golden Bell Frog, if required.</li> </ul>		
BI-4	Spread of weeds	<p>A weed management plan will be developed as part of the BMP and incorporated into the CEMP. The plan will detail:</p> <ul style="list-style-type: none"> <li>• Weed management priorities and objectives</li> <li>• Identification of weeds on the construction site</li> <li>• Sensitive environmental areas within and next to the proposal area, such as the wetland to the south of the Wentworth Avenue underpass</li> <li>• Location of weed infested areas</li> <li>• Mechanical weed control methods such as slashing or mowing, as well as a range of herbicides to avoid the development of herbicide resistance</li> <li>• Procedures to control the use of pesticides, particularly near waterways and immediately before or during wet weather</li> <li>• Measures to prevent the spread of weeds</li> <li>• Procedures for the appropriate disposal of weed-infested materials and soils</li> <li>• Monitoring program to measure the success of weed management</li> <li>• Communication protocol with Botany Bay City Council noxious weed representative.</li> </ul>	Construction contractor	Pre-construction
BI-5	Introduction or spread of pests and disease	<p>Measures to confirm the presence of pathogens and disease-causing agents will be carried out before construction. Should pathogens or disease-causing agents be found, measures will be implemented to prevent their introduction and/or spread to the proposal area. These measures are provided in the Biodiversity Guidelines and will include, where appropriate:</p> <ul style="list-style-type: none"> <li>• The provision of vehicle and boot wash-down facilities to ensure vehicles and footwear are free of soil before entering or exiting the site</li> <li>• Procedures to ensure that the risk of spreading pathogens and the mitigation measures required on site are regularly communicated to staff and contractors during inductions and toolbox talks</li> <li>• The programming of construction activities so they move from uninfected areas to any known infected areas</li> <li>• The restriction of vehicles to designated roadsides and parking areas</li> <li>• Specific measures for treating <i>Phytophthora cinnamomi</i> and chytrid fungus.</li> </ul>	Construction contractor	Pre-construction, construction

No.	Impact	Environmental safeguards	Responsibility	Timing
<b>Hydrology</b>				
HY-1	Flood impacts on adjacent properties due to altered flood behaviour	Further flood modelling, including a detailed afflux assessment, will be carried out during detailed design to confirm impacts on surrounding land uses.	Roads and Maritime/ Detailed design contractor	Detailed design
HY-2	Licensing for dewatering	The NSW Office of Water will be consulted during detailed design to confirm licensing requirements for the various stages of the proposal.	Roads and Maritime	Detailed design
HY-3	Impact to groundwater levels	Roads and Maritime, in consultation with NSW Office of Water, will carry out a bore census to confirm the status of the groundwater works identified as part of the groundwater assessment.	Roads and Maritime	Detailed design
HY-4	Dewatering	<p>A procedure will be prepared for any dewatering activities to be included as part of the SWMP. The dewatering procedure is to comply with Roads and Maritime Technical Guideline – Environmental Management of Construction Site Dewatering. The procedure will include at a minimum:</p> <ul style="list-style-type: none"> <li>• A map showing areas of the proposal that will require dewatering</li> <li>• Detailed description and justification of all selected dewatering methods</li> <li>• Description of onsite water reuse requirements</li> <li>• A map showing proposed discharge locations for any offsite discharge</li> <li>• Design requirements for each offsite discharge location to prevent erosion at the discharge location or in the receiving environment</li> <li>• Water quality objectives relevant to the type of dewatering activity</li> <li>• Description of the water quality treatment techniques to be used</li> <li>• Water sampling and testing regime to validate water quality prior to and (if required) during dewatering, including to establish appropriate waste disposal methods</li> <li>• Description of the method for dewatering</li> <li>• Requirements to manage encounters with groundwater or contaminated water.</li> </ul>	Roads and Maritime	Pre-construction
HY-5	Flooding of construction site	<p>A contingency plan will be prepared to manage a potential flood event during construction and will outline:</p> <ul style="list-style-type: none"> <li>• Procedure for communication and notification associated with contingency plan</li> <li>• Procedures to reduce risk including removal of all plant/equipment, stabilising exposed areas and maintaining existing flood flow paths through the site</li> </ul>	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> <li>• Evaluation of what flood event will trigger the plan</li> <li>• Evacuation procedures</li> <li>• A map indicating the area that is flood prone and the locations where to evacuate.</li> </ul>		
HY-6	Impact to groundwater levels and quality	<p>A Groundwater Monitoring and Management Plan will be prepared to accompany the Soil and Water Management Plan for the proposal. It will include:</p> <ul style="list-style-type: none"> <li>• Measures to manage groundwater during construction</li> <li>• Location of piezometers</li> <li>• Monitoring and sampling frequency for groundwater levels and groundwater quality</li> <li>• Evaluate any drawdown during construction</li> <li>• Reporting frequency</li> <li>• Timing of activities associated with monitoring. For instance, monitoring of flow, level and quality will continue for 12 months after the project is complete.</li> </ul>	Construction contractor	Construction
HY-7	Higher than expected inflow volumes	The NSW Office of Water will be advised if the expected inflow volume is observed, or deemed likely to exceed 3 ML/y. Measures to rectify drawdown may include installation of a second, outer containment structure, or reinjection, down-gradient on the other side of containment.	Construction contractor/ Roads and Maritime	Construction
HY-8	Operational impact on capacity of Sydney Airport detention basin	The capacity of the Sydney Airport detention basin will be further investigated in detailed design.	Roads and Maritime	Detailed design
HY-9	Impacts on groundwater	<p>An assessment will be carried out to confirm the potential groundwater impacts due to the proposed option/s chosen to manage groundwater for the new underpass. The following will be considered for the assessment:</p> <ul style="list-style-type: none"> <li>• The potential impacts due to the proposal on the groundwater level.</li> <li>• The potential impacts due to the proposal on Mill Ponds</li> <li>• Management methods of groundwater during construction</li> <li>• Management methods of groundwater during operation.</li> </ul>	Roads and Maritime	Detailed design
<b>HY-10</b>	<b>Groundwater Management and Monitoring Plan</b>	<b><i>The Groundwater Management and Monitoring Plan will be made available to SACL. Detailed design will investigate groundwater management and groundwater monitoring for the proposal area and any indirectly affected areas. The groundwater monitoring strategy will also provide detail about monitoring before and after construction within the vicinity of the Wentworth Avenue underpass.</i></b>	<b>Roads and Maritime</b>	<b>Detailed design</b>

No.	Impact	Environmental safeguards	Responsibility	Timing
<b>HY-11</b>	<b>Hydrology</b>	<b>Roads and Maritime will carry out further hydrology investigations as part of the detailed design. These investigations will consider in more detail surface water flows within the proposal area, as well as drainage conditions upstream of the Ascot Drain.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
<b>Landscape character and visual amenity</b>				
LC-1	General	The detailed design will incorporate the landscape and urban design strategy and objectives described in Section 3 of the Landscape Character and Visual Impact Assessment (Corkery Consulting + Studio Colin Polwarth, 2014). The landscape and urban design strategy for detailed design will be prepared in consultation with SACL. Roads and Maritime will also liaise with Botany Bay City Council and owners of the Beckenham Memorial Church regarding landscaping on their property.	Roads and Maritime	Detailed design
LC-2	Landscape design	During detailed design, the landscape design principles and streetscape (planting) will be reviewed to ensure that they are consistent with the outcomes of the biodiversity assessment. This will be done in consultation with Roads and Maritime environment and urban design staff.	Roads and Maritime	Detailed design
LC-3	Visual impacts of construction activities	To reduce the potential visual impact of construction activities: <ul style="list-style-type: none"> <li>• Work sites will be left tidy at the end of each work day</li> <li>• Where appropriate, fencing with material attached (eg shade cloth) will be provided around the construction compound to screen views from adjoining properties</li> <li>• Lighting for night-time work will comply with relevant Australian Standards, including AS4282-1997 (Control of the obtrusive effects of outdoor lighting).</li> </ul>	Construction contractor	Construction
LC-4	Visual impacts of compound, stockpile and storage areas	Following construction, temporary compound, stockpile and storage areas will be removed, cleared of all rubbish and materials, and rehabilitated.	Construction contractor	Post-construction
<b>LC-5</b>	<b>Landscape and urban design strategy</b>	<b>A detailed urban design and landscape strategy will be prepared as part of the detailed design of the proposal and will consider:</b> <ul style="list-style-type: none"> <li>• <b>The impact of removing existing landscaping and its current amenity and value</b></li> <li>• <b>Airport operational issues in the selection of replacement vegetation, roadside furniture and other urban design elements.</b></li> </ul> <b>The landscape and urban design strategy will be made available to SACL for comment when it is complete. Roads and Maritime will continue to consult</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>

No.	Impact	Environmental safeguards	Responsibility	Timing
		<i>with SACL regarding landscaping in the area between General Holmes Drive and the Port Botany Freight Rail Line.</i>		
<b>Topography, geology, soils and water quality</b>				
SWQ-1	Pollution as a result of sediment entering waterways during construction and operation	Water management controls and an associated maintenance and inspection program will be investigated during detailed design in accordance with the water quality control strategy for the proposal, with specific focus on the Wentworth Avenue underpass. During detailed design, the following will be confirmed: <ul style="list-style-type: none"> <li>• Requirement for water quality measures</li> <li>• Location and size of water quality measures</li> <li>• Capacity for spills in the sediment basin design volume.</li> </ul>	Design contractor	Detailed design
SWQ-2	Acid sulphate soils	During detailed design, an Acid Sulfate Soil Management Plan will be prepared. The plan will include as a minimum: <ul style="list-style-type: none"> <li>• A summary of the available ASS information relevant to the proposal area</li> <li>• Confirm the process for identification of ASS/PASS throughout construction</li> <li>• Identify areas where ASS/PASS are expected during project activities</li> <li>• Indicate the management measures to be implemented if ASS/PASS is encountered during dewatering</li> <li>• Indicate the management measures to be implemented if ASS/PASS is excavated during piling activities</li> <li>• Outline the monitoring requirements for ASS/PASS to confirm the surrounding area is being protected</li> <li>• Confirm the treatment and disposal requirements for any ASS/PASS encountered</li> <li>• Detail the reporting requirements.</li> </ul>	Design contractor	Detailed design
SWQ-3	Soil and water quality	A Soil and Water Management Plan (SWMP) will be prepared as part of the CEMP in accordance with the requirements of RMS contract specification G38 prior to the commencement of construction. The SWMP will also address the following: <ul style="list-style-type: none"> <li>• Roads and Maritime Code of Practice for Water Management, the Roads and Maritime Erosion and Sedimentation Procedure</li> <li>• The NSW Soils and Construction – Managing Urban Stormwater Volume 1 “the Blue Book” (Landcom, 2004) and Volume 2 (DECC, 2008)</li> <li>• Roads and Maritime Technical Guideline: Temporary Stormwater Drainage for Road Construction, 2011</li> <li>• Roads and Maritime Technical Guideline: Environmental Management of</li> </ul>	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		Construction Site Dewatering, 2011.		
SWQ-4	Soil and water quality	<p>The SWMP will detail the following as a minimum:</p> <ul style="list-style-type: none"> <li>• Identification of catchment and sub-catchment areas, high risk areas and sensitive areas</li> <li>• Sizing of each of the above areas and catchment</li> <li>• The likely volume of run-off from each road sub-catchment</li> <li>• Direction of flow of on-site and off-site water</li> <li>• Separation of on-site and off-site water</li> <li>• The direction of run-off and drainage points during each stage of construction</li> <li>• The locations and sizing of sediment traps such as sump or basin as well as associated drainage</li> <li>• Dewatering plan which includes process for monitoring, flocculating and dewatering water from site (ie sediment basin and sumps)</li> <li>• Identification of areas of PASS that may be encountered during the dewatering work and mitigation measures required if encountered</li> <li>• The staging plans, location, sizing and details of creek alignment and realignment controls for scour protection and bank and bed stabilisation including those used during construction and long term.</li> <li>• A mapped plan identifying the above</li> <li>• Include progressive site specific Erosion and Sedimentation Control Plans (ESCPs). These plans are to be updated at least fortnightly</li> <li>• A process to routinely monitor the BOM weather forecast</li> <li>• Contingency for any acid sulphate soils or salinity found during construction</li> <li>• Preparation of a wet weather (rain event) plan which includes a process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather. These controls are to be shown on the ESCPs</li> <li>• Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls.</li> </ul>	Roads and Maritime	Pre-construction
SWQ-5	Contaminants entering receiving environments during construction	<p>The following measures relating to the storage and management of plant, equipment, chemicals fuels and liquids will be implemented to minimise the risk of contaminants entering receiving environments (including soil, water and air):</p> <ul style="list-style-type: none"> <li>• Designated exclusion zones will be identified for the storage and use of construction plant and equipment. These zones will delineate traffic areas and restrict entry and exit points to construction sites</li> </ul>	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> <li>• All fuels, chemicals and liquids will be stored and disposed of in accordance with Storing and Handling Liquids: Environmental Protection Participants Manual (DECC, 2007)</li> <li>• Refuelling of plant and equipment will occur in bunded areas located a minimum of 40 m from drainage lines or waterways</li> <li>• Plant, equipment and vehicle washdown will occur in a designated bunded area away from waterways and drainage lines</li> <li>• All concrete washouts will occur into a sealed receptacle or bunded concrete washout area with an impermeable liner. The concrete washout area will be sized to be 120% of the estimated volume of the waste that will be received into the washout area at any one time</li> <li>• Any material transported onto pavement surfaces will be swept and removed at the end of each working day.</li> </ul>		
SWQ-6	Management of stockpile and compound sites	<p>Management measures for stockpile and compound sites will be incorporated in the SWMP and ESCPs and will include the following measures:</p> <ul style="list-style-type: none"> <li>• Stockpile and compound sites will be located away from overland flow paths and areas of high topography with minimal upstream catchment</li> <li>• Stockpile and compound sites will be maintained in accordance with Roads and Maritime's Stockpile Site Management Procedures (Roads and Maritime, 2001)</li> <li>• The number and size of stockpile and compound sites will be minimised throughout the proposal</li> <li>• Runoff from stockpile and compound sites will be treated with a stockpile-specific sediment basin, which will be monitored</li> <li>• The base of stockpile and compound sites will be lined if they are to be located over a shallow water table, and will be covered with plastic sheets, where required</li> <li>• Identify areas where ASS or PASS will be encountered during excavation activities</li> <li>• Indicate the stockpile management measures to be implemented if ASS or PASS are excavated during piling activities</li> <li>• Vehicle movements will be restricted to designated pathways, where feasible.</li> </ul>	Construction contractor	Construction
SWQ-7	Accidental spills during construction, resulting in the release of	A site-specific Emergency Spill Plan will be developed as part of the SWMP. It will include spill management measures in accordance with the Code of Practice for Water Management and Bunding and Liquid Chemical Storage, Handling and Spill Management (DEC, 2005) and Roads and Maritime's Environmental Incident Classification and Reporting Procedures (Roads and Maritime, 2014)	Construction contractor	Construction



No.	Impact	Environmental safeguards	Responsibility	Timing
	contaminants into waterways and the soil	Should a spill occur during construction, the Emergency Spill Plan will be implemented. Emergency spill kits will be kept at areas identified as having the highest spill risk at all times.		
<b>Contamination</b>				
CL-1	Identification and management of contaminated land	<p>A Contamination Management Plan (CMP) will be prepared in accordance with the <i>Contaminated Land Act 1997</i> and relevant EPA Guidelines. This plan will form part of the CEMP and will include at a minimum:</p> <ul style="list-style-type: none"> <li>Contaminated land legislation and guidelines including any relevant licences and approvals to be obtained</li> <li>Identification of rehabilitation requirements, classification, transport and disposal requirements of any contaminated land within the construction footprint</li> <li>Contamination management measures including waste classification and reuse procedures and unexpected finds procedures</li> <li>Monitoring and sampling procedure for landfill seepage (leachate)</li> <li>A procedure for dewatering and disposal of potentially contaminated liquid waste</li> <li>In the event that indications of contamination are encountered (known and unexpected, including odorous or visual indicators), work in the area will immediately cease until a contamination assessment can be prepared to advise on the need for remediation or other action, as deemed appropriate</li> <li>A process for reviewing and updating the plan.</li> </ul>	Construction contractor	Pre-construction
CL-2	Remedial Action Plan for contaminated areas	<p>A Remedial Action Plan (RAP) will be prepared and implemented in accordance with relevant regulatory requirements. The RAP will include:</p> <ul style="list-style-type: none"> <li>Relevant procedures to manage health and safety of construction staff during remediation</li> <li>Validation of residual soils in any resulting excavations to demonstrate suitability of remaining materials to remain on site</li> <li>Further assessment of the wetland area including an assessment of the stockpiled material within the wetland area and waste classification under the Waste Classification Guidelines (DECCW, 2009) for off-site removal.</li> </ul> <p>The RAP and Validation Report will be provided to ARTC for review and comment.</p>	Construction contractor	Pre-construction
CL-3	Management of asbestos	<p>An asbestos management plan will be prepared as part of the CEMP and will be in accordance with NSW EPA guidelines (including waste guidelines) and relevant industry codes of practice. The asbestos management plan will include but not be limited to:</p>	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> <li>• Identification of potential asbestos on site</li> <li>• Procedures to manage and handle asbestos and avoid cross contamination</li> <li>• Outline the mitigation measures for encountering asbestos</li> <li>• Procedures for disposal of asbestos in accordance with NSW EPA guidelines (including the waste guidelines) and relevant industry codes of practice.</li> </ul>		
CL-4	Classification and disposal of potential contaminants	All potentially contaminated wastes generated during construction will be classified according to the Waste Classification Guidelines: Parts 1 and 2 (DECC, 2008). Wastes will be disposed to a licensed disposal facility or re-used in construction, as appropriate.	Construction contractor	Construction
CL-5	Management of contamination on ARTC land	Contaminated material located at the stockpile site on the southern side of the proposed Wentworth Avenue underpass (refer to <b>Figure 7-15</b> ) will be legally disposed from ARTC land at an appropriately licensed facility. Fill material permanently located on ARTC land will be certified clean.	Construction contractor	Construction
<b>CL-6</b>	<b>Remediation of SACL land</b>	<b>Details on the remediation of land will be agreed with SACL during lease negotiations.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
<b>Air quality</b>				
AQ-1	Air quality impact during construction	<p>An Air Quality Management Plan (AQMP) will be prepared as part of the CEMP. The plan will include but not be limited to:</p> <ul style="list-style-type: none"> <li>• A map identifying locations of sensitive receivers</li> <li>• Identification of potential risks/impacts due to the work/activities as dust generation activities</li> <li>• Management measures to minimise risk including a progressive stabilisation plan</li> <li>• A process for monitoring dust on site and weather conditions</li> <li>• A process for altering management measures as required.</li> </ul> <p>The management measures within the AQMP will include as a minimum:</p> <ul style="list-style-type: none"> <li>• Vehicles transporting waste or other materials that have a potential to produce odours or dust are to be covered during transportation</li> <li>• Dust will be suppressed on stockpiles and unsealed or exposed areas using methods such as water trucks, temporary stabilisation methods, soil binders or other appropriate practices</li> <li>• Disturbed areas will be minimised in extent and rehabilitated progressively</li> <li>• Speed limits will be imposed on unsealed surfaces</li> <li>• Stockpiles will be located as far away as feasible from residences and other sensitive receivers</li> </ul>	Roads and Maritime	Pre-construction Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> <li>Works (including the spraying of paint and other materials) will not be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely</li> <li>Plant, vehicles and equipment will be maintained in a proper and efficient manner and in accordance with manufacturer's specifications</li> <li>Wind conditions will be monitored and activities scheduled where possible to avoid winds with a high potential (ie strong winds from the west or southwest) to avoid adverse impacts at nearest sensitive receivers.</li> </ul>		
<b>Aboriginal heritage</b>				
AH-1	Unexpected find of Aboriginal heritage artefacts	<p>In the event of an unexpected find of an Aboriginal heritage item (or suspected item):</p> <ul style="list-style-type: none"> <li>Work will cease in the affected area</li> <li>The Roads and Maritime's Environmental Officer, Sydney Region will be contacted for advice on how to proceed</li> <li>The Unexpected Archaeological Finds Procedure (Roads and Maritime, 2012) will be followed.</li> </ul>	Construction contractor	Construction
<b>Land use and property</b>				
LU-1	Property acquisition	Roads and Maritime will consult with property owners impacted by the proposal. Property acquisition will be managed in accordance with the provisions of Roads and Maritime's Land Acquisition Policy (Roads and Maritime, 2012b) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .	Roads and Maritime	Detailed design
LU-2	<b>Memorandum of Understanding (MOU)</b>	<b>Roads and Maritime will continue to consult with SACL to agree on an MOU for the proposal.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
LU-3	<b>Use of land leased to SACL</b>	<b>The use of leased land and any conditions associated with the use of that land will be agreed between SACL and Roads and Maritime during preparation of the lease agreement. Details on stockpiling will be agreed with SACL during lease negotiations.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
LU-4	<b>Impacts on SACL land and assets</b>	<b>Roads and Maritime will continue to investigate opportunities to reduce the impact of the proposal in SACL land and assets.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
<b>Socio-economic</b>				
SE-1	Community consultation	<p>A Communication Plan will be prepared and included in the CEMP. The Communication Plan will include (as a minimum):</p> <ul style="list-style-type: none"> <li>Requirements to provide details and timing of proposed activities to affected</li> </ul>	Construction contractor	Pre-construction Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		residents <ul style="list-style-type: none"> <li>Contact name and number for complaints</li> <li>Procedure to notify adjacent land users for changed conditions during the construction period such as traffic, pedestrian or driveway access.</li> </ul> The communications plan will be prepared in accordance with G36 requirements and Roads and Maritime's Community Engagement and Communications Manual (2012).		
SE-2	Local goods and services	Goods and services will be sourced locally during construction wherever possible to support the local economy.	Construction contractor	Construction
<b>SE-3</b>	<b>Proposal feedback</b>	<b>Roads and Maritime will continue to consider proposal feedback during subsequent stages of proposal development.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
<b>SE-4</b>	<b>Airport infrastructure and assets</b>	<b>Any airport infrastructure and assets affected by the proposal will be restored and/or relocated by Roads and Maritime.</b>	<b>Roads and Maritime</b>	<b>Construction</b>
<b>SE-5</b>	<b>Impact of the proposal on SACL signage</b>	<b>Roads and Maritime will investigate locations for the relocated advertising structure at Ascot Lodge. A new site for the structure will be selected by Roads and Maritime in consultation with SACL.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
<b>SE-6</b>	<b>Adjustment, relocation and protection of utility services</b>	<b>Further detail regarding adjustment, relocation or protection of utility services will be made available to SACL.</b>	<b>Roads and Maritime</b>	<b>Detailed design</b>
<b>Greenhouse gas and climate change</b>				
GG-1	Impacts on climate change from construction activities	During construction, the following measures will be considered and implemented where possible: <ul style="list-style-type: none"> <li>Plant and equipment will be switched off when not in use</li> <li>Vehicles, plant and construction equipment will be appropriately sized for the task and properly maintained so as to achieve optimum fuel efficiency</li> <li>Materials will be delivered with full loads and will come from local suppliers, where possible</li> <li>Energy efficiency and related carbon emissions will be considered when selecting vehicles and equipment</li> <li>Vegetation clearing will be reduced as much as feasible, and re-established in suitable areas when construction is completed</li> <li>Waste will be reduced and recycled as a preference before disposing to landfill.</li> </ul>	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
GG-2	Climate change risks to construction	Environmental safeguards and management measures in the CEMP will be designed to accommodate and respond to the increased frequency and severity of rainfall events.	Construction contractor	Pre-construction
<b>Waste and resource management</b>				
WR-1	Generation of construction waste	<p>The following resource management hierarchy principles will be followed through the project life cycle:</p> <ul style="list-style-type: none"> <li>• Unnecessary resource consumption will be avoided as a priority</li> <li>• Where avoidance is not possible, waste will be processed for resource recovery (including reuse of materials, reprocessing, recycling and energy recovery)</li> <li>• Where resource recovery is not possible, waste will be disposed as a last resort at an appropriately licensed waste facility – in accordance with the <i>Waste Avoidance and Resource Recovery Act 2001</i> and the EPA waste classification guidelines</li> <li>• Procurement will endeavour to use materials and products with a recycled content, provided that material or product is cost-effective and performance-effective.</li> </ul>	Construction contractor	Detailed design, pre-construction, construction
WR-2	Generation of construction waste	<p>A Resource and Waste Management Plan (RWMP) will be prepared and include the following (as a minimum):</p> <ul style="list-style-type: none"> <li>• The type, classification and volume of all materials to be generated and used on site including identification of recyclable and non-recyclable waste in accordance with EPA Waste Classification Guidelines</li> <li>• Quantity and classification of excavated material generated as a result of the proposal (refer to Roads and Maritime's Waste Management Fact sheets 1-6, 2012)</li> <li>• Interface strategies for cut and fill on site to ensure re-use where possible</li> <li>• Strategies to 'avoid', 'reduce', 'reuse' and 'recycle' materials.</li> <li>• Classification and disposal strategies for each type of material</li> <li>• Destinations for each resource/waste type either for on-site reuse or recycling, offsite reuse or recycling, or disposal at a licensed waste facility</li> <li>• Details of how material will be stored and treated on-site.</li> <li>• Identification of available recycling facilities on and off site</li> <li>• Identification of suitable methods and routes to transport waste.</li> <li>• Procedures and disposal arrangements for unsuitable excavated material or contaminated material</li> <li>• Site clean-up for each construction stage.</li> </ul>	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
<b>Cumulative environmental impacts</b>				
CE-1	Cumulative traffic <b>and noise</b> impacts from construction of multiple projects	The CEMP will be updated as required to incorporate potential cumulative impacts from surrounding development activities as they become known. This will include close liaison with the authorities carrying out the other projects, and a process to review and update mitigation measures as new work begins or if complaints are received.	Construction contractor	Detailed design Pre-construction Construction
CE-2	Cumulative construction impacts	A working group will be formed to manage cumulative construction impacts associated with the proposal and other Sydney Airport and Roads and Maritime projects. This group will also coordinate between the projects and the proposal.	Roads and Maritime	Detailed design
<b>CE-3</b>	<b>Consultation with SACL regarding cumulative noise impacts</b>	<b>Roads and Maritime will continue to consult with SACL regarding the potential for cumulative noise impacts due to concurrent construction of Roads and Maritime and SACL developments.</b>	<b>Roads and Maritime</b>	<b>Detailed design Pre-construction Construction</b>

### 6.3 Licensing and approvals

Licences and approvals required for the proposal are listed in **Table 6-2**.

**Table 6-2 Summary of licensing and approval required**

Requirement	Timing
Adjustment of the Sydney Airport Group curtilage would be sought from the Commonwealth Department of Environment in consultation with SACL	Before construction
Aquifer interference licence would be sought under the <i>Water Management Act 2000</i> from the NSW Office of Water	Before construction, if required
S140 approval to excavate would be sought from the NSW Heritage Council	Before construction
NSW Traffic Management Centre approval may be required for the closure of traffic lanes and the movement of over-sized vehicles on Wentworth Avenue and Southern Cross Drive	Before construction, if required

## 7 References

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Austrroads (2009) *Austrroads Guide to Road Design*.

Department of Environment and Climate Change (DECC) (2009) *Interim Construction Noise Guideline*, July 2009.

Department of Environment, Climate Change and Water (DECCW) (2011) *NSW Road Noise Policy*, March 2011.

Landcom (2004) *Soils and Construction – Managing Urban Stormwater*, Volume 1, March 2004.

Roads and Maritime (2015) *WestConnex Enabling Works – Airport East Precinct Review of Environmental Factors*, February 2015.

Roads and Traffic Authority (2001) *Environmental Noise Management Manual*

Wilkinson Murray (2014) *Construction Noise and Vibration Impact Assessment*, November 2014.

Wilkinson Murray (2015a) *Noise Impacts on Ibis Hotel*, March 2015.

Wilkinson Murray (2015b) *Operational Noise and Vibration Impact Assessment*, January 2015.



# Appendix A

## Community updates

NOVEMBER 2013



## WestConnex enabling works – airport east precinct

Roads and Maritime Services is planning to upgrade roads east of the airport and remove the General Holmes Drive rail level crossing. This will improve traffic flow and access to the airport, Port Botany and, in the future, the WestConnex motorway.

The strategic concept design for the proposed upgrade is on display for community comment until **Friday 13 December 2013**.

### Background

Sydney Kingsford Smith Airport and Port Botany are two of Australia's most important international gateways. The roads around the airport and Port Botany are becoming increasingly congested due to rising numbers of passenger and freight vehicles. This proposal will support the development of the WestConnex motorway, which will improve access between this area and Western Sydney.

The proposal is consistent with the State Infrastructure Strategy, Long Term Transport Master Plan and draft Airport Master Plan.

A number of options to support future growth, improve access, reduce congestion and improve the movement of freight have been considered.

The current proposal has been assessed as best meeting the needs, with the least impacts. For more information on the assessment of the options, see the proposal report at [www.rms.nsw.gov.au/roadprojects/AirportEast](http://www.rms.nsw.gov.au/roadprojects/AirportEast) or contact the project team.

**Have your say!** See inside for more details

WestConnex enabling works, airport east precinct



← To Southern Sydney

Mascot

BAXTER ROAD

JOYCE DRIVE

Existing shared pedestrian/cycle path to be removed

Road clos

SIR REGINALD ANSETT DRIVE

Airport access work in planning by Sydney Airport Corporation Limited

Left in, left out access only

New bus s

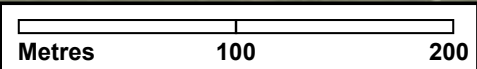
SYDNEY AIRPORT

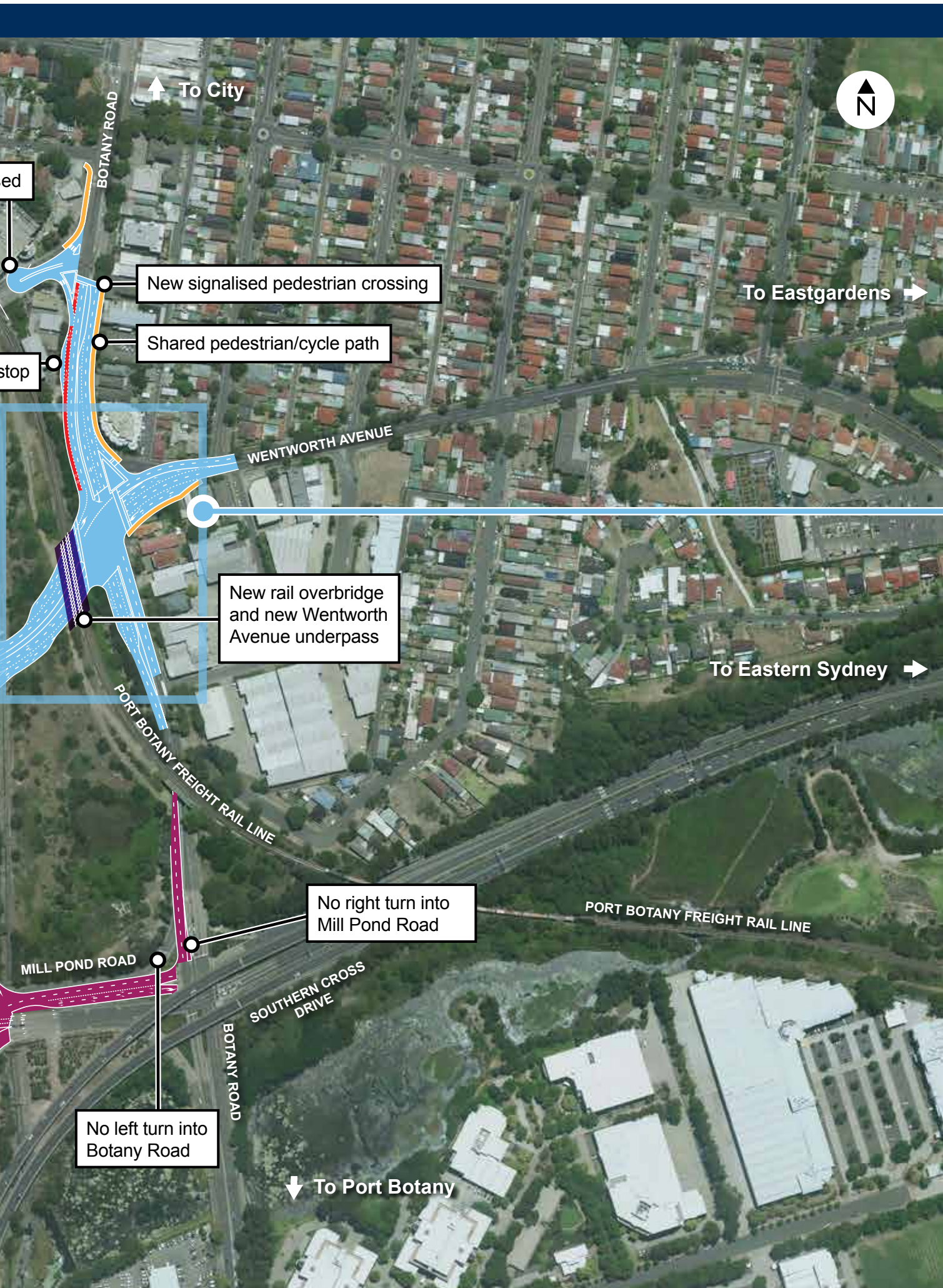
GENERAL HOLMES DRIVE

**KEY**

- █ Widening to provide six lanes
- █ Minor road works and linemarkings to provide six lanes
- █ New Wentworth Avenue underpass and associated work
- █ Mill Pond Road work
- █ Shared pedestrian/cycle path
- █ Existing bus lane
- ▬▬▬ Existing shared path to be removed

Three right turn lanes into Mill Pond Road reduced to two





↑ To City



New signalised pedestrian crossing

Shared pedestrian/cycle path

To Eastgardens →

WENTWORTH AVENUE

New rail overbridge and new Wentworth Avenue underpass

To Eastern Sydney →

PORT BOTANY FREIGHT RAIL LINE

No right turn into Mill Pond Road

PORT BOTANY FREIGHT RAIL LINE

MILL POND ROAD

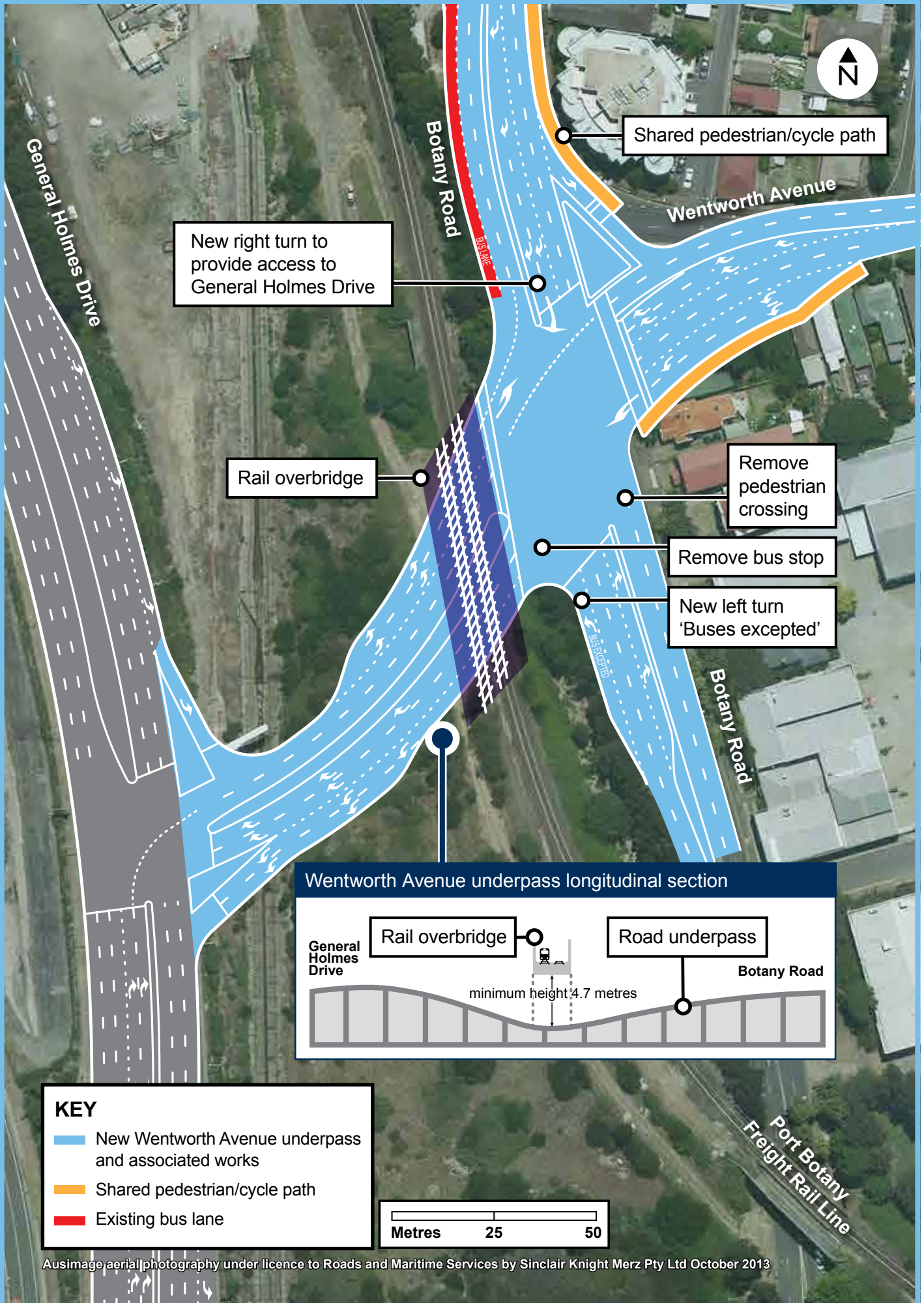
SOUTHERN CROSS DRIVE

No left turn into Botany Road

BOTANY ROAD

↓ To Port Botany

Wentworth Avenue intersection



New right turn to provide access to General Holmes Drive

Shared pedestrian/cycle path

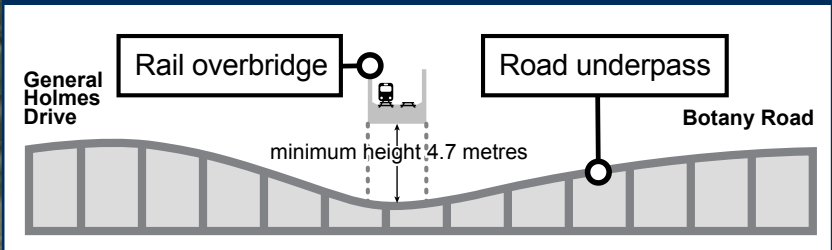
Rail overbridge

Remove pedestrian crossing

Remove bus stop

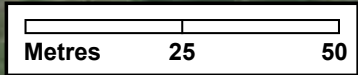
New left turn 'Buses excepted'

Wentworth Avenue underpass longitudinal section



**KEY**

- New Wentworth Avenue underpass and associated works
- Shared pedestrian/cycle path
- Existing bus lane



Ausimage aerial photography under licence to Roads and Maritime Services by Sinclair Knight Merz Pty Ltd October 2013

## Key features and benefits

Key features and benefits of the proposal are:

- Replace the General Holmes Drive rail level crossing with a road underpass that links General Holmes Drive, Botany Road and Wentworth Avenue to improve the movement of rail freight and improve access to the airport, Mascot and the eastern suburbs.
- Improvements to the Mill Pond Road intersections with General Holmes Drive and Botany Road to support future growth and access to the airport.
- Widen Joyce Drive and General Holmes Drive between O’Riordan Street and Mill Pond Road to three lanes in each direction to improve traffic flow around the airport and to Port Botany.

## Community involvement

Roads and Maritime recognises the importance of involving the community in the development of this proposal. Feedback received will be considered and addressed in the community issues report which will be available at [www.rms.nsw.gov.au/roadprojects/AirportEast](http://www.rms.nsw.gov.au/roadprojects/AirportEast) or on request. Further opportunity for the community to comment on the proposal will be available with the display of the concept design and the environmental impact assessment.

## What happens next?



General Holmes Drive railway level crossing

# Have your say

## Have your say

Have your say on the proposal to upgrade roads east of the airport and remove the General Holmes Drive rail level crossing. Please send written comments by **Friday 13 December 2013**.

**Email** AirportEast@rms.nsw.gov.au

**Mail** Airport East  
Roads and Maritime Services  
PO Box 973  
Parramatta CBD NSW 2124

**View** [www.rms.nsw.gov.au/roadprojects/AirportEast](http://www.rms.nsw.gov.au/roadprojects/AirportEast)

**Call** Jim Campbell  
Project Development Manager  
1300 862 844

## Community information sessions

Visit one of the community information sessions to discuss the project with the project team

- **Saturday 23 November 2013**  
drop in any time between 10am and 1pm
- **Thursday 28 November 2013**  
drop in any time between 5pm and 9pm

### Mascot Public School

Corner of King Street and Botany Road, Mascot  
(entrance off King Street)



## Translating and Interpreting Service

If you need an interpreter, please call the Translating and Interpreting Service (TIS National) on **131 450** and ask them to telephone Roads and Maritime Services on 1300 862 844.

### Arabic

إذا كنتم بحاجة إلى مترجم، الرجاء الاتصال بخدمة الترجمة الخطية والشفهية (TIS National) على الرقم **131 450**، والطلب منهم الاتصال بوكالتكم على الرقم 1300 862 844.

### Cantonese

若你需要口譯員，請致電 **131 450** 聯絡翻譯和口譯服務署 (TIS National)，要求他們致電 1300 862 844 聯絡 Roads and Maritime Services。

### Mandarin

如果你需要口译员，请致电 **131 450** 联系翻译和口译服务署 (TIS National)，要求他们致电 1300 862 844 联系 Roads and Maritime Services。

### Greek

Αν χρειάζεστε διερμηνέα, παρακαλείστε να τηλεφωνήσετε στην Υπηρεσία Μετάφρασης και Διερμηνείας (Εθνική Υπηρεσία TIS) στο **131 450** και ζητήστε να τηλεφωνήσουν Roads and Maritime Services στο 1300 862 844.

### Italian

Se desiderate l'assistenza di un interprete, prego telefonare al Servizio Interpreti e Traduttori (TIS National) al **131 450** chiedendo di contattare Roads and Maritime Services al 1300 862 844.

### Korean

통역사가 필요하시면 번역통역서비스 (TIS National)에 **131 450** 으로 연락하여 이들에게 1300 862 844 번으로 Roads and Maritime Services 에 전화하도록 요청하십시오.

### Vietnamese

Nếu cần thông ngôn viên, xin quý vị gọi cho Dịch Vụ Thông Phiên Dịch (TIS Toàn Quốc) qua số **131 450** và nhờ họ gọi cho Roads and Maritime Services qua số 1300 862 844.



## Roads and Maritime Services

**Privacy:** Roads and Maritime Services is subject to the *Privacy and Personal Information Protection Act 1998* ("PPIP Act") which requires that we comply with the Information Privacy Principles set out in the PPIP Act.

All information in correspondence is collected for the sole purpose of assisting in the assessment of this proposal. The information received, including names and addresses of respondents, may be published in subsequent documents unless a clear indication is given in the correspondence that all or part of that information is not to be published. Otherwise Roads and Maritime will only disclose your personal information, without your consent, if authorised by the law. Your personal information will be held by Roads and Maritime at 27 Argyle Street, Parramatta NSW 2150. You have the right to access and correct the information if you believe that it is incorrect.

JUNE 2014

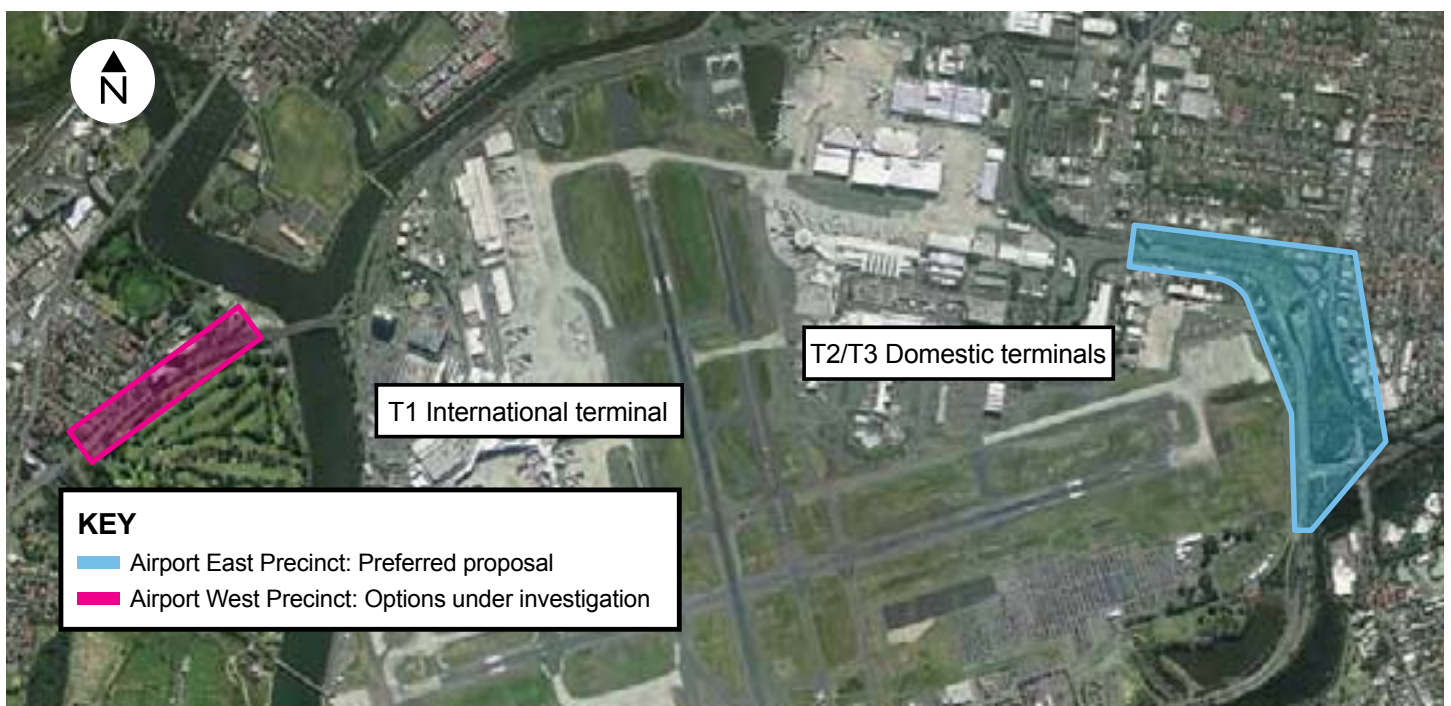


## Sydney Airport – WestConnex enabling works

The NSW Government is planning to upgrade roads around the airport and remove the General Holmes Drive rail level crossing. Proposed road improvements in the Airport east precinct will improve the movement of freight trains servicing Port Botany and improve traffic flow and access to the airport, Port Botany and, in the future, the WestConnex motorway. The NSW and Australian governments are jointly funding the Airport east precinct works.

Roads and Maritime has also commenced investigations into proposed improvements to the off-airport roads in the Airport north precinct and the Airport west precinct. These investigations will look at options for improving traffic movements in the Airport north precinct in the vicinity of

O’Riordan Street, Mascot and in the Airport west precinct at Marsh Street, Arncliffe. The proposed upgrades will become a suite of works that include the Airport east precinct and will complement Sydney Airport’s upgrades to the on-airport road network.





## Airport East Precinct

Sydney Kingsford Smith Airport and Port Botany are two of Australia's most important international gateways. The roads around the Airport and Port Botany are becoming increasingly congested due to rising numbers of passenger and freight vehicles. This proposal will support the development of the WestConnex motorway, which will improve access between this area and Western Sydney.

The proposal is consistent with the State Infrastructure Strategy, Long Term Transport Master Plan and Airport Master Plan.

In November 2013, Roads and Maritime prepared a Proposal Report that documented why the road upgrade is required, the strategic route options that were considered, the advantages and disadvantages of each option and the chosen proposal for community comment.

The proposal was available for community comment during November and December 2013. The feedback from this consultation is captured in the Community Consultation Report available on the project website.



**General Holmes Drive railway level crossing**

Since then, Roads and Maritime has considered community feedback and undertaken further technical investigations, using the findings to refine the key features of the displayed proposal. This process, and the proposal as it now stands, are documented in the Preferred Proposal Report.

For more information and to see all reports visit [www.rms.nsw.gov.au/roadprojects/AirportEast](http://www.rms.nsw.gov.au/roadprojects/AirportEast) or contact the project team.

### Key features and benefits

The key features and benefits of the proposal are:

- Replace the General Holmes Drive rail level crossing with a road underpass that links General Holmes Drive, Botany Road and Wentworth Avenue to improve the movement of rail freight and improve access to the Airport, Mascot and the eastern suburbs.
- Improvements to the Mill Pond Road intersections with General Holmes Drive and Botany Road to support future growth and access to the Airport.
- Widen Joyce Drive and General Holmes Drive between O'Riordan Street and Mill Pond Road to three lanes in each direction to improve traffic flow around the Airport and to Port Botany.

Additional features and benefits of the preferred proposal are:

- Provide additional lanes to increase road capacity at General Holmes Drive, Joyce Drive, Mill Pond Road and Botany Road.
- Extend the proposed shared path to link to the existing cycle way on Wentworth Avenue to improve connections for pedestrians and cyclists.
- Retain the northbound bus stop on Botany Road close to the existing location to meet community needs.

These additional features and benefits were implemented in response to community feedback. Roads and Maritime received fifty eight submissions to the proposal for the Airport east precinct. Overall the proposal has been well received by the community.

WestConnex enabling works, airport east precinct



← To Southern Sydney

Mascot

BAXTER ROAD

JOYCE DRIVE

Existing pedestrian path to be removed

Road closure rail level removed

SIR REGINALD ANSETT DRIVE

Airport access work in planning by Sydney Airport Corporation Limited will fit with improvements to the Airport north precinct

Left in, left out access only

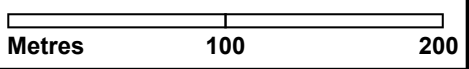
SYDNEY AIRPORT

GENERAL HOLMES DRIVE

New access to Wentworth Avenue and Botany Road northbound

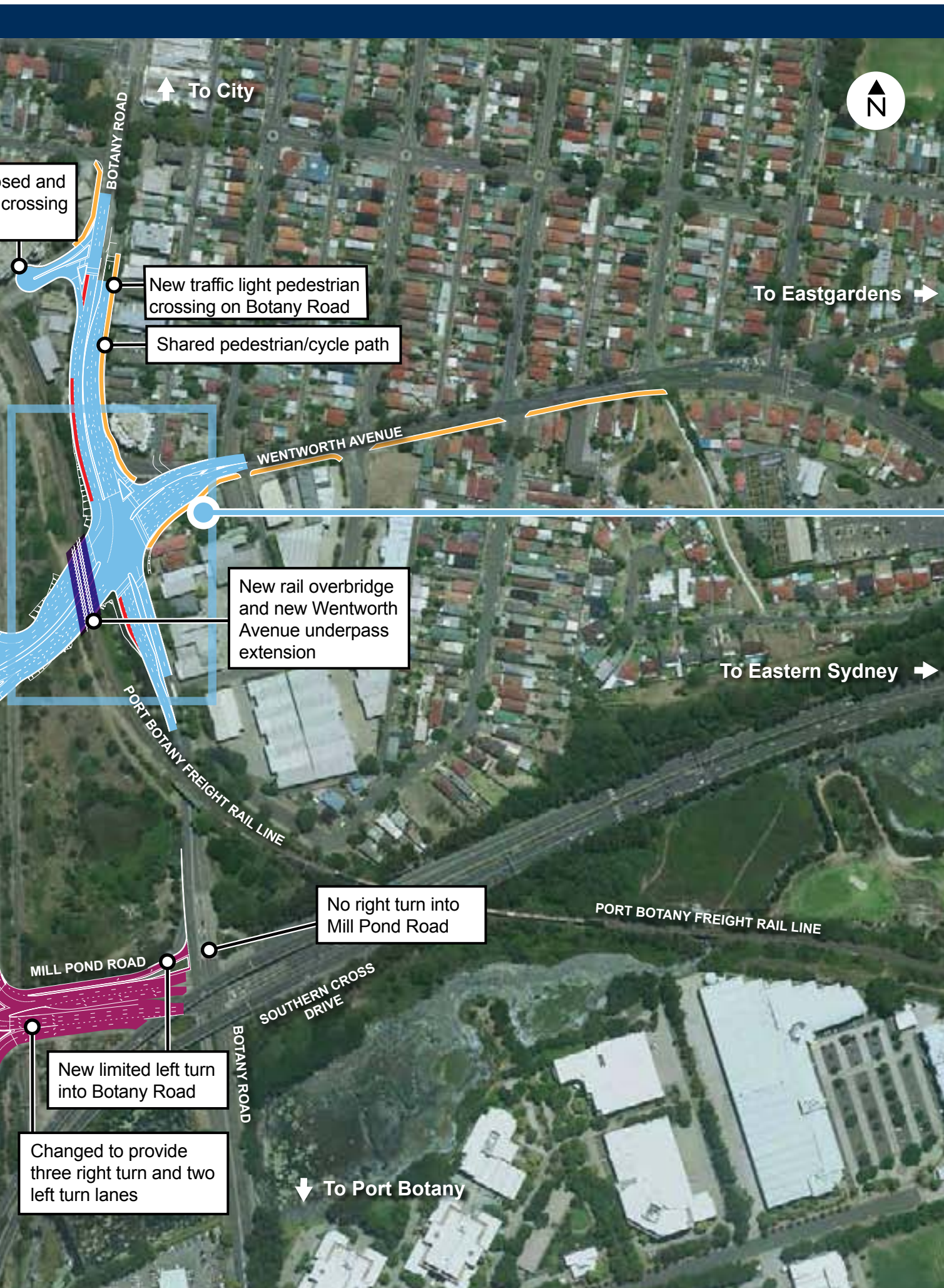
**KEY**

- █ Widening to provide six lanes
- █ Minor road works and linemarking to provide six lanes
- █ New Wentworth Avenue underpass and associated work
- █ Mill Pond Road work
- █ Shared pedestrian/cycle path
- █ Existing bus lane
- █ Existing pedestrian path to be removed



Three right turn lanes into Mill Pond Road reduced to one

↓ To Brighton Le Sands



↑ To City



Used and crossing

New traffic light pedestrian crossing on Botany Road

Shared pedestrian/cycle path

→ To Eastgardens

WENTWORTH AVENUE

New rail overbridge and new Wentworth Avenue underpass extension

→ To Eastern Sydney

PORT BOTANY FREIGHT RAIL LINE

No right turn into Mill Pond Road

PORT BOTANY FREIGHT RAIL LINE

MILL POND ROAD

New limited left turn into Botany Road

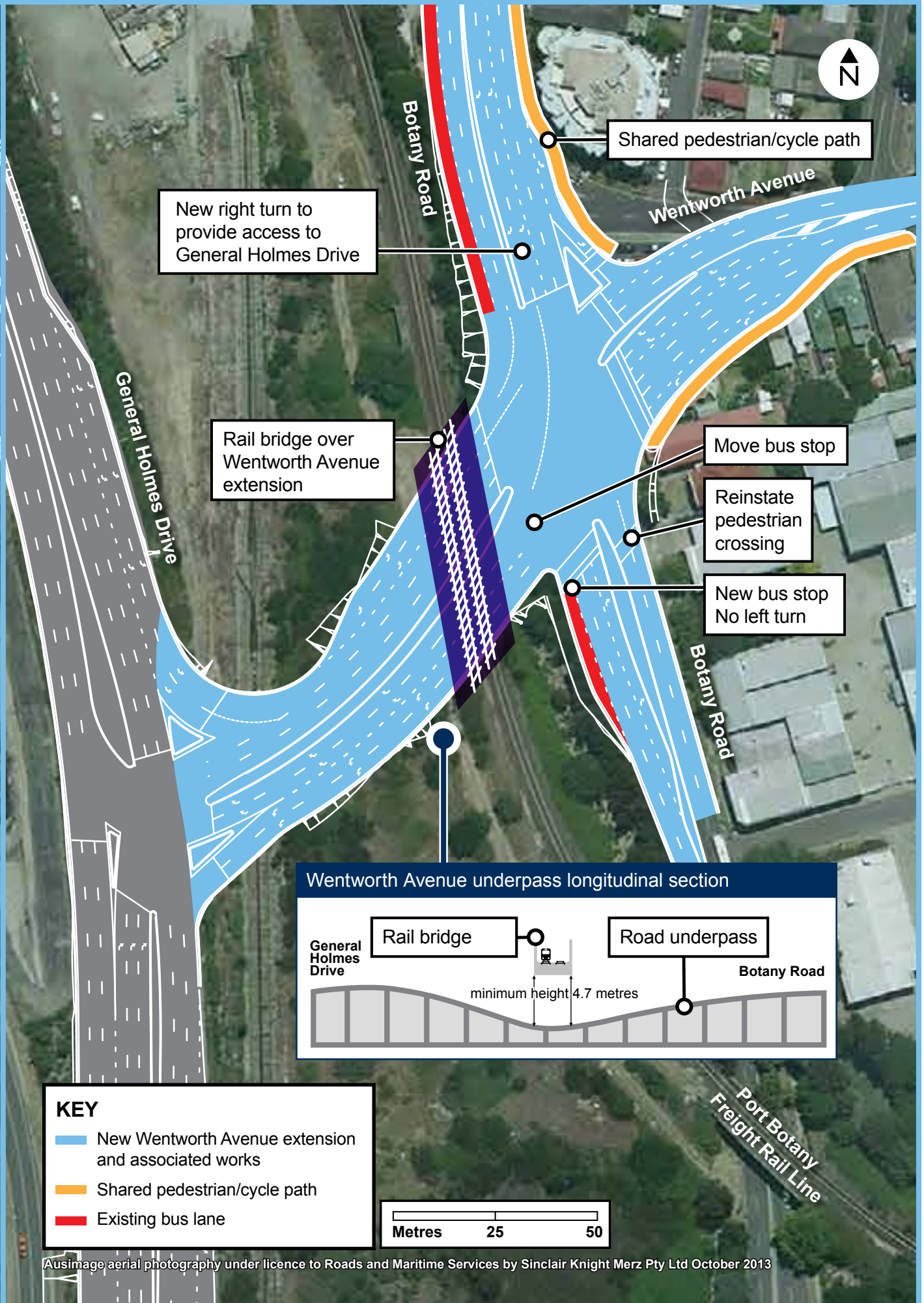
SOUTHERN CROSS DRIVE

BOTANY ROAD

Changed to provide three right turn and two left turn lanes

↓ To Port Botany

Wentworth Avenue extension



## Airport West Precinct

Roads and Maritime Services is proposing to widen Marsh Street, Arncliffe as part of the enabling works for the WestConnex motorway. Marsh Street, Arncliffe is the primary connection to the Sydney Airport international terminal. It is a key access point for the M5 Motorway and Sydney's southern suburbs and provides local access for residents and businesses of Wolli Creek and Arncliffe.

Roads and Maritime Services is proposing to widen Marsh Street to provide an additional westbound lane to relieve congestion and increase traffic capacity. This proposal will support the development of the WestConnex motorway, which will improve access between this area and Western Sydney.

The proposed work includes:

- Widening of Marsh Street to three lanes westbound between the Giovanni Brunetti Bridge and the M5 interchange to ease congestion.
- A dedicated cycleway on the southern side of Marsh Street to connect the existing concrete path on the bridge to the Eve Street Cycleway to improve cycle access.

Roads and Maritime Services will keep the community and stakeholders updated about the proposed work. The community will have the opportunity to provide feedback before the proposal is finalised.

## What happens next?



Existing Marsh Street looking west

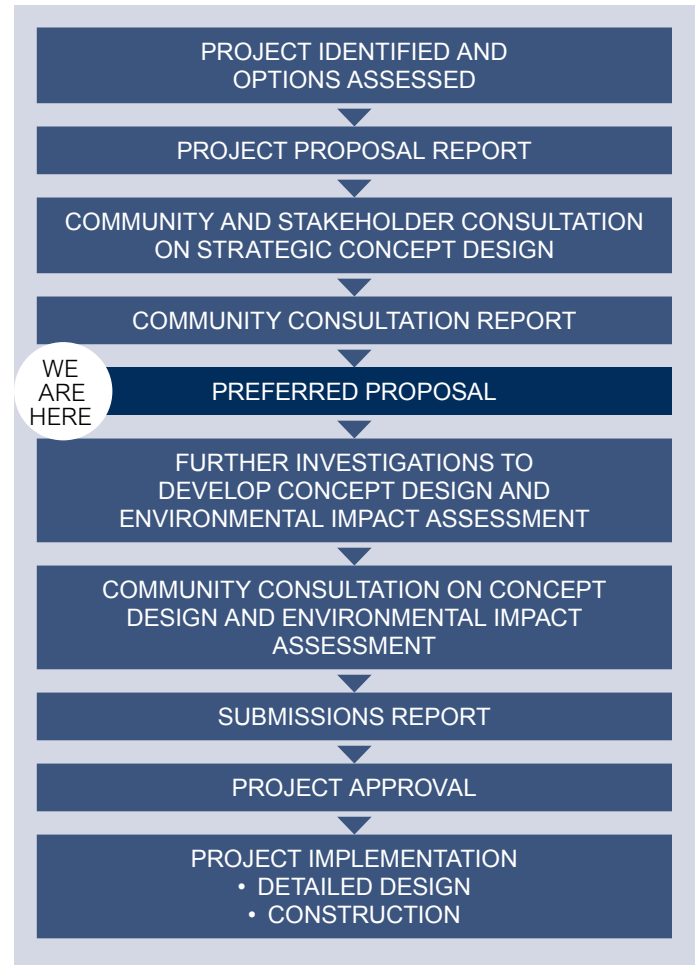
Some of the key topics raised included traffic volume and congestion, public transport and the shared user path. The added features were further supported by traffic modelling and technical investigations.

Property acquisition was another key topic raised during the consultation period. Face to face meetings were held with potentially affected property owners to discuss the proposal and the property acquisition processes.

One alternative proposal, that was not adopted, included the widening of Wentworth Avenue from four lanes to six lanes between Botany Road and Sutherland Street. Traffic modelling found that widening Wentworth Avenue within the current road network would have a greater impact on property but would not provide a substantial improvement to congestion in the area.

The preferred proposal does allow for the possibility of widening this section of Wentworth Avenue in the future.

## What happens next?



Existing Wentworth Avenue Intersection

## For more information

### Airport East Precinct

**Email** AirportEast@rms.nsw.gov.au

**Mail** Airport East Precinct  
Roads and Maritime Services  
PO Box 973  
Parramatta CBD NSW 2124

**View** [www.rms.nsw.gov.au/roadprojects/AirportEast](http://www.rms.nsw.gov.au/roadprojects/AirportEast)

**Call** Jim Campbell  
Project Development Manager  
1300 862 844

## For more information

### Airport West Precinct

**Email** AirportWest@rms.nsw.gov.au

**Mail** Airport West Precinct  
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**View** [www.rms.nsw.gov.au/roadprojects/AirportWest](http://www.rms.nsw.gov.au/roadprojects/AirportWest)

**Call** Sonja Ross  
Project Development Manager  
1300 862 844



## Translating and Interpreting Service

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### Arabic

إذا كنتم بحاجة إلى مترجم، الرجاء الاتصال بخدمة الترجمة الخطية والشفهية (TIS National) على الرقم **131 450** والطلب منهم الاتصال بوكالتكم على الرقم **1300 862 844**.

### Cantonese

若你需要口譯員，請致電 **131 450** 聯絡翻譯和口譯服務署 (TIS National)，要求他們致電 **1300 862 844** 聯絡 Roads and Maritime Services。

### Mandarin

如果你需要口译员，请致电 **131 450** 联系翻译和口译服务署 (TIS National)，要求他们致电 **1300 862 844** 联系 Roads and Maritime Services。

### Greek

Αν χρειάζεστε διερμηνέα, παρακαλείστε να τηλεφωνήσετε στην Υπηρεσία Μετάφρασης και Διερμηνείας (Εθνική Υπηρεσία TIS) στο **131 450** και ζητήστε να τηλεφωνήσουν Roads and Maritime Services στο **1300 862 844**.

### Italian

Se desiderate l'assistenza di un interprete, prego telefonare al Servizio Interpreti e Traduttori (TIS National) al **131 450** chiedendo di contattare Roads and Maritime Services al **1300 862 844**.

### Korean

통역사가 필요하시면 번역통역서비스 (TIS National)에 **131 450** 으로 연락하여 이들에게 **1300 862 844** 번으로 Roads and Maritime Services 에 전화하도록 요청하십시오.

### Vietnamese

Nếu cần thông ngôn viên, xin quý vị gọi cho Dịch Vụ Thông Phiên Dịch (TIS Toàn Quốc) qua số **131 450** và nhờ họ gọi cho Roads and Maritime Services qua số **1300 862 844**.



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All information in correspondence is collected for the sole purpose of assisting in the assessment of this proposal. The information received, including names and addresses of respondents, may be published in subsequent documents unless a clear indication is given in the correspondence that all or part of that information is not to be published. Otherwise Roads and Maritime will only disclose your personal information, without your consent, if authorised by the law. Your personal information will be held by Roads and Maritime at 27 Argyle Street, Parramatta NSW 2150. You have the right to access and correct the information if you believe that it is incorrect.

# Have your say

FEBRUARY 2015



## Airport East Precinct – WestConnex enabling works

The Australian and NSW governments are planning to upgrade roads in the Airport East precinct and remove the General Holmes Drive rail level crossing by constructing a road under pass. This would provide better rail freight facilities to and from Port Botany, and improve traffic flow and access to the airport, Port Botany and, in the future, the WestConnex motorway. Roads and Maritime Services is inviting the community and stakeholders to provide feedback on the concept design and Review of Environmental Factors by **Friday 13 March 2015**.

### Background

Sydney's Kingsford Smith Airport and Port Botany are two of Australia's most important international gateways. The roads around the airport and Port Botany are becoming increasingly congested due to more passenger and freight vehicle movements.

Following community consultation, Roads and Maritime has developed a concept design and a Review of Environmental Factors which will be placed on public exhibition for feedback until **Friday 13 March**. Display dates and venues are listed on the back page.

### Key features and benefits

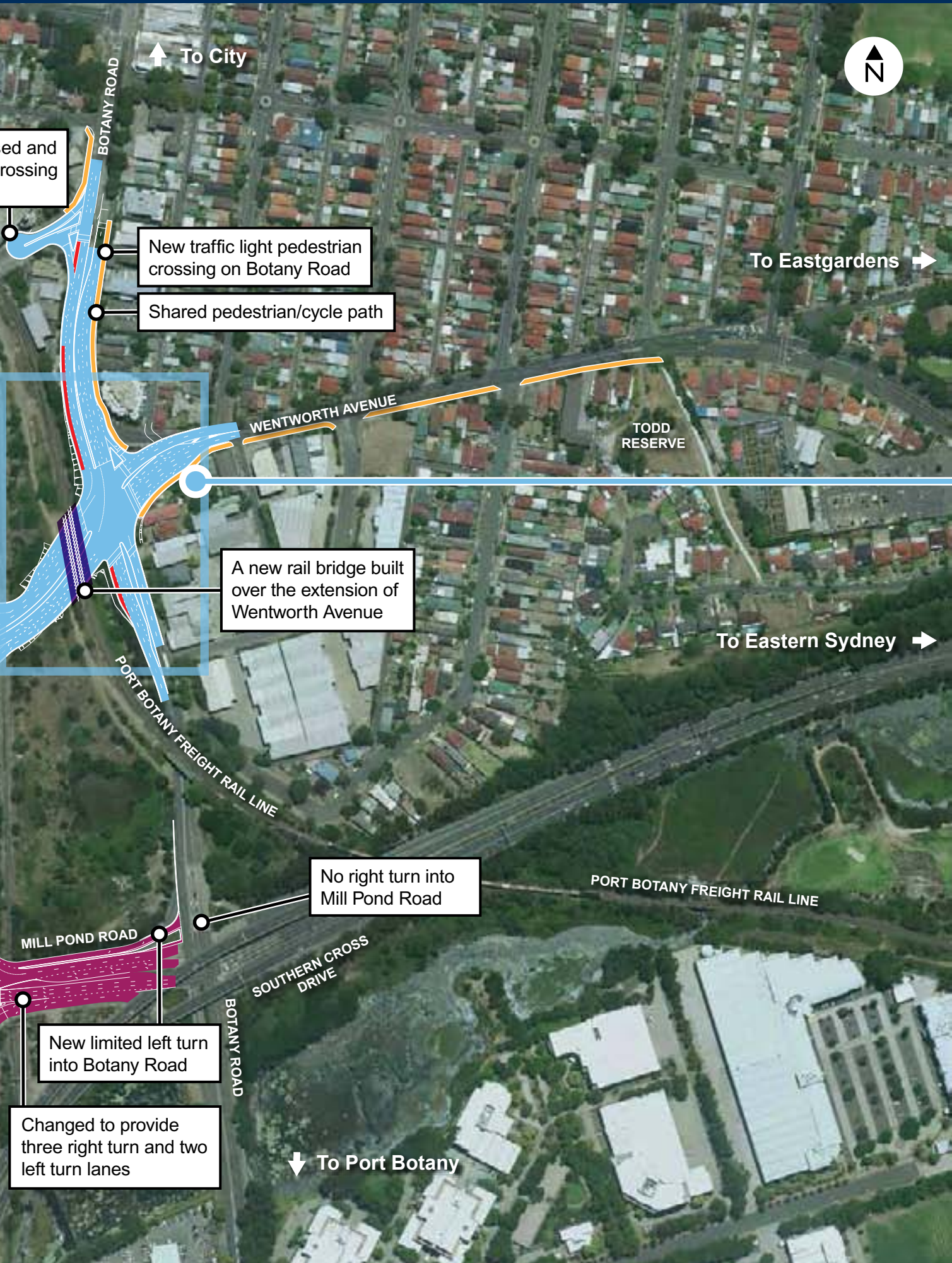
The key features of the Airport East proposal include:

- Replacing the General Holmes Drive rail level crossing with a road underpass that links General Holmes Drive, Botany Road and Wentworth Avenue. This would improve road safety and the movement of rail freight and road access to the airport, mascot, the Sydney CBD and the eastern suburbs
- Providing improvements to the Mill Pond Road intersections with General Holmes Drive and Botany Road to support future growth and access to the Airport



WestConnex enabling works, airport east precinct





↑ To City



ed and crossing

New traffic light pedestrian crossing on Botany Road

Shared pedestrian/cycle path

To Eastgardens →

WENTWORTH AVENUE

TODD RESERVE

A new rail bridge built over the extension of Wentworth Avenue

To Eastern Sydney →

PORT BOTANY FREIGHT RAIL LINE

No right turn into Mill Pond Road

PORT BOTANY FREIGHT RAIL LINE

MILL POND ROAD

New limited left turn into Botany Road

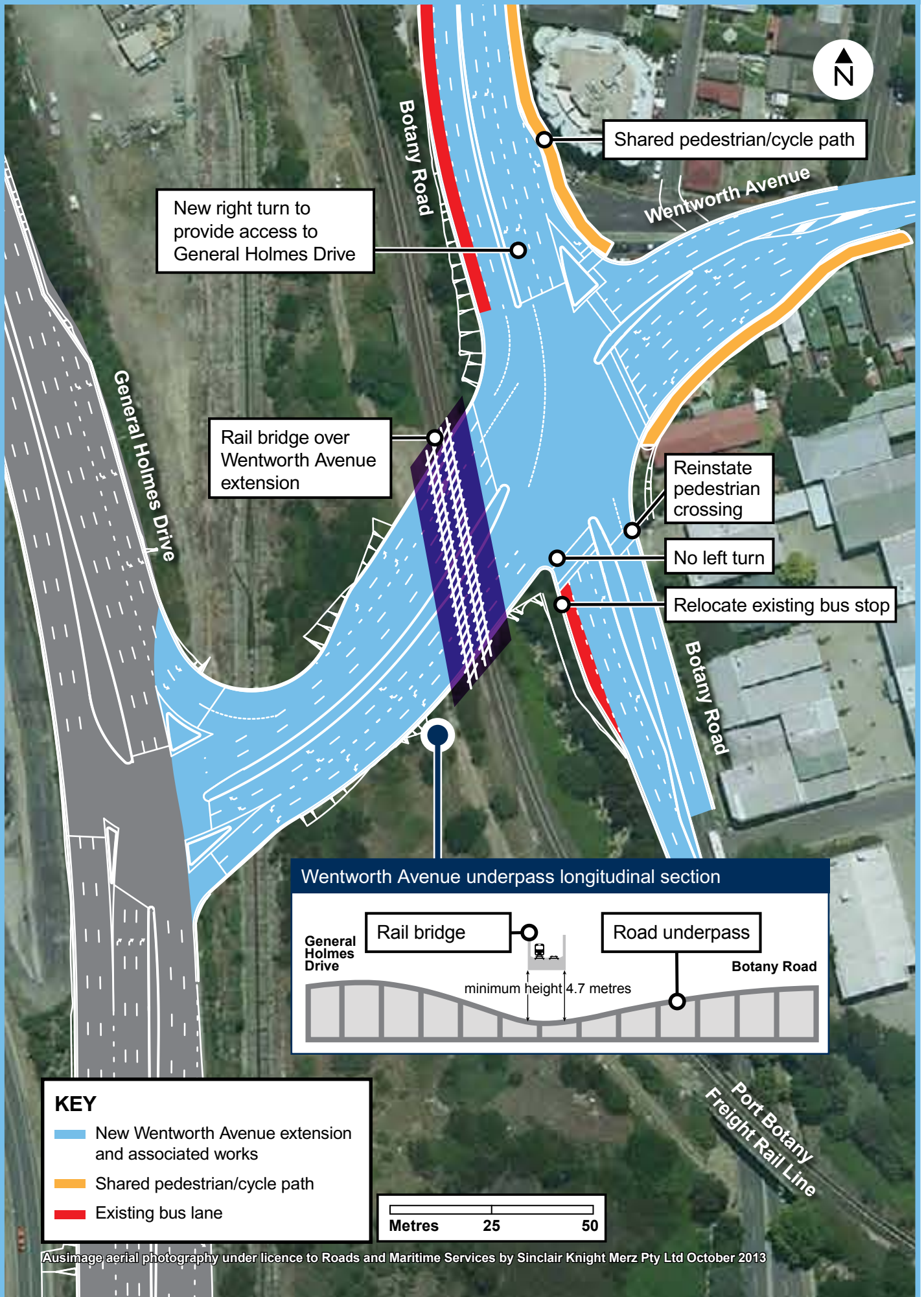
SOUTHERN CROSS DRIVE

BOTANY ROAD

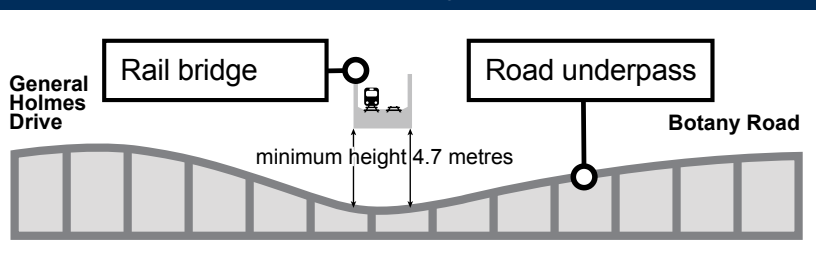
Changed to provide three right turn and two left turn lanes

↓ To Port Botany

Wentworth Avenue extension

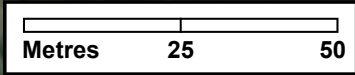


Wentworth Avenue underpass longitudinal section



**KEY**

- New Wentworth Avenue extension and associated works
- Shared pedestrian/cycle path
- Existing bus lane



- Widening Joyce Drive and General Holmes Drive between O’Riordan Street and Mill Pond Road to three lanes in each direction to improve traffic flow around the Airport and to Port Botany.
- Creating a new shared path to link to the existing cycle way on Wentworth Avenue to improve connections for pedestrians and cyclists at:
  - Todd Reserve on Wentworth Avenue
  - Botany Road from the Botany Road and Wentworth Avenue intersection to Baxter Road
- Retaining the northbound bus stop on Botany Road close to the existing location to meet community needs.

We have provided a diagram to help better explain the proposal.

## Community involvement

Roads and Maritime recognises the importance of involving the community in the development of this proposal. Feedback received during the consultation period will be considered and addressed in a submissions report which will be available to the public in coming months.

## Next steps

All comments received will be considered in finalising the project design. If there are further changes to the design the community will be informed.



## Display locations

The Review of Environmental Factors can be viewed at these display locations until **Friday 13 March**.

### Transport Information Centre

Cnr George and King Streets  
388 George Street,  
Sydney NSW 2000  
Monday – Friday,  
9am–5pm

### City of Botany Bay Council

Administration Centre  
141 Coward Street,  
Mascot NSW 2020  
Monday – Friday,  
8:30am–4:30pm

### Central Library

Westfield Shoppingtown  
Ground floor, Banks Avenue,  
Eastgardens NSW 2035  
Monday – Friday, 10am–6pm  
Saturdays, 9:30am–4pm



**Existing Wentworth Avenue intersection with Botany Road**

## Have your say

Roads and Maritime is seeking community and stakeholder feedback on the Airport East concept design and Review of Environmental Factors by **Friday 13 March**.

Visit one of our community information sessions to discuss the proposal with the project team.

- **Thursday 5 March**

Drop in any time between 4pm and 6pm  
Eastlakes Hall  
Florence Street, Eastlakes

- **Saturday 7 March**

Drop in any time between 10am and 12 noon  
Eastlakes Hall  
Florence Street, Eastlakes

Please send your written comments to:

Airport East Precinct  
Roads and Maritime Services  
PO Box 973  
Parramatta CBD NSW 2124

Or email [AirportEast@rms.nsw.gov.au](mailto:AirportEast@rms.nsw.gov.au)

## Further information

For further information about the Airport East proposal, please contact the project team:

**Phone** 1300 862 844

**Email** [AirportEast@rms.nsw.gov.au](mailto:AirportEast@rms.nsw.gov.au)

**Web** [www.rms.nsw.gov.au/roadprojects/AirportEast](http://www.rms.nsw.gov.au/roadprojects/AirportEast)

**Mail** Airport East Precinct  
Roads and Maritime Services  
PO Box 973  
Parramatta CBD NSW 2124



This document contains important information about road projects in your area. If you require the services of an interpreter, please contact the Translating and Interpreting Service on 131 450 and ask them to call the project team on 1300 660 275. The interpreter will then assist you with translation.

## Roads and Maritime Services

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RMS 15.039



# Appendix B

## Noise and vibration additional assessment

# WESTCONNEX ENABLING WORKS

## NOISE IMPACTS ON IBIS HOTEL

**REPORT NO. 14174-IB**  
**VERSION A**

MARCH 2015

**PREPARED FOR**

ROADS AND MARITIME SERVICES  
27 ARGYLE STREET  
PARRAMATTA NSW 2150

## DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	31 March 2015	Sean Flaherty	John Wassermann

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### Quality Assurance

We are committed to and have implemented AS/NZS ISO 9001:2008 "Quality Management Systems – Requirements". This management system has been externally certified and Licence No. QEC 13457 has been issued.



### AAAC

This firm is a member firm of the Association of Australian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.



### Celebrating 50 Years in 2012

Wilkinson Murray is an independent firm established in 1962, originally as Carr & Wilkinson. In 1976 Barry Murray joined founding partner Roger Wilkinson and the firm adopted the name which remains today. From a successful operation in Australia, Wilkinson Murray expanded its reach into Asia by opening a Hong Kong office early in 2006. 2010 saw the introduction of our Queensland office and 2011 the introduction of our Orange office to service a growing client base in these regions. From these offices, Wilkinson Murray services the entire Asia-Pacific region.





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## GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

**Maximum Noise Level ( $L_{Amax}$ )** – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

**$L_{A1}$**  – The  $L_{A1}$  level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the  $L_{A1}$  level for 99% of the time.

**$L_{A10}$**  – The  $L_{A10}$  level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the  $L_{A10}$  level for 90% of the time. The  $L_{A10}$  is a common noise descriptor for environmental noise and road traffic noise.

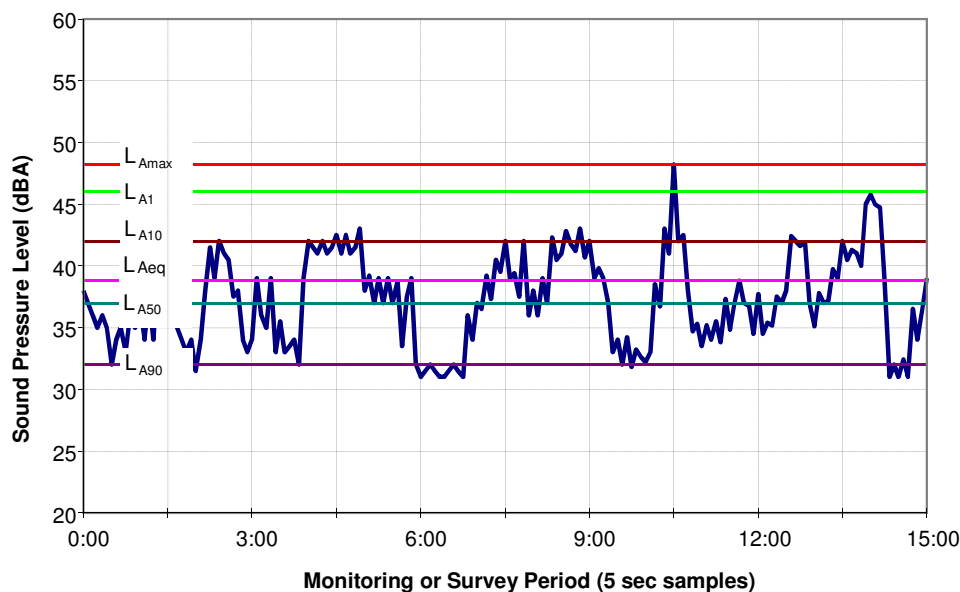
**$L_{A90}$**  – The  $L_{A90}$  level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the  $L_{A90}$  level for 10% of the time. This measure is commonly referred to as the background noise level.

**$L_{Aeq}$**  – The equivalent continuous sound level ( $L_{Aeq}$ ) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

**ABL** – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10<sup>th</sup> percentile (lowest 10<sup>th</sup> percent) background level ( $L_{A90}$ ) for each period.

**RBL** – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



## 1 INTRODUCTION

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Roads and Maritime Services (RMS) is planning to upgrade roads east of Sydney airport and remove the General Holmes Drive rail level crossing. This will improve traffic flow and access to the airport, Port Botany and, in the future, the WestConnex motorway.

Wilkinson Murray has undertaken construction and operational noise assessments for the Project, the findings of which have been documented in two reports:

- *WestConnex Enabling Works (Airport East) Construction Noise Impact Statement* (dated 28/11/2014); and
- *WestConnex Enabling Works (Airport East) Operational Noise Impact Statement* (dated 06/01/2015).

Since the publication of these reports a further sensitive receiver has been identified - the Ibis Hotel, located on Joyce Drive (See Figure 1-1). At the request of RMS the existing construction and operational noise models prepared for the existing assessments have been updated in order to predict construction and operational noise levels external to the hotel.

This report presents the results of this further modelling.

**Figure 1-1 View of the Ibis Hotel - Looking East from Joyce Drive**



## 2 INTERNAL NOISE CRITERIA RELEVANT TO HOTELS

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The assessments previously undertaken have applied noise criteria based on the provisions of the *NSW Road Noise Policy (RNP, 2011)* and the *NSW Interim Construction Noise Guideline (ICNG, 2009)*. These criteria apply principally to residential uses and not strictly to temporary accommodation uses, such as the Ibis Hotel. For assessment criteria relevant to hotels the *RNP* and *ICNG* refer to the Australian/New Zealand Standard *AS/NZS 2107:2000 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors*.

### **AS/NZS 2107:2000**

Australian/New Zealand Standard *AS/NZS 2107:2000* recommends that the following internal noise limits are not exceeded due to extraneous noise sources in hotels situated near major roads:

- Sleeping Areas -  $L_{Aeq}$  35 dB(A) satisfactory and  $L_{Aeq}$  40 dB(A) maximum

Wilkinson Murray considers the maximum internal design standard of  $L_{Aeq}$  40 dB(A) to be an appropriate noise goal for this Project.

Based on review of the hotel's external façade from *Google Streetview* imagery, it would be expected that an outside to inside reduction of 35 dB would be achieved due to a combination of fixed substantial glazing and limited glazed area.

With consideration to the expected 35 dB façade attenuation and an internal noise goal of  $L_{Aeq}$  40 dB(A), an external noise criterion of  $L_{Aeq}$  75 dBA has been adopted for both operation and construction by this assessment.

### 3 OPERATIONAL NOISE ASSESSMENT

Based on the modelling procedures described in the identified operational noise impact statement, daytime and night time traffic noise levels for the year 2013 and design year 2018 have been predicted at the external facades of the Ibis Hotel. The predicted levels are set out in Table 3-1.

**Table 3-1 Year 2013 "No Build" and Year 2018 "Build" Predicted  $L_{Aeq,Period}$  Traffic Noise Levels**

Receiver	$L_{Aeq,Period}$ (dBA) Year 2013 'No Build'		$L_{Aeq,Period}$ (dBA) Year 2018 'Build'		External Noise Criteria $L_{Aeq}$ (dBA)		Compliance	
	Day	Night	Day	Night	Day	Night	Day	Night
	Ibis Hotel	71	66	72	67	75	75	Yes

As shown in Table 3-1, the adopted external noise criteria would be expected to be met with the operation of the Project and therefore adequate internal noise levels may be expected.

Only marginal changes in traffic noise levels (< 1 dB) are predicted between 2013 and 2018. This is principally attributed to the relatively minor changes in anticipated vehicle volumes between these years.

A 1 dB increase is unnoticeable to most people and therefore it is considered unlikely the Ibis hotel would experience any notable change in perceived external or internal noise levels due to the Project's operation.

The road network re-alignment would not be expected to give rise to any material increase in maximum noise levels at the hotel with respect to the existing layout. It is considered, therefore, that the project would not give rise to any material risk of increased maximum noise level impacts.

## 4 CONSTRUCTION NOISE ASSESSMENT

Based on the modelling procedures described in the identified construction noise impact statement, construction noise levels have been predicted at the external facades of the Ibis Hotel. Worst-case construction noise levels, based on all the identified sources operating simultaneously and continuously, are presented in Table 4-1.

**Table 4-1 Worst Case Predicted  $L_{Aeq,15min}$  Construction Noise Levels**

<b>Construction Activity</b>	<b>Predicted <math>L_{Aeq,15min}</math> (dBA)</b>	<b>External Noise Criteria <math>L_{Aeq}</math> (dBA)</b>	<b>Compliance</b>	<b>Exceedance</b>
General Holmes Widening	59	75	Yes	Nil
Joyce Drive Widening	86	75	No	11
New Rail Bridges	53	75	Yes	Nil
Botany Road Intersection Upgrade	56	75	Yes	Nil
Finalisation Works	57	75	Yes	Nil

As shown in Table 4-1, the adopted external noise criteria would be expected to be met during most of the identified construction activities and therefore adequate internal noise levels may generally be expected.

The highest construction noise levels would be expected to arise during the Joyce Drive widening works, which are predicted to result in an exceedance of up to 11 dB. Therefore the Joyce Drive widening works should be managed through the mitigation measures detailed in the Project's noise management plan, as detailed in identified Construction Impact Statement.

## 5 CONCLUSION

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Roads and Maritime Services (RMS) is planning to upgrade roads east of Sydney airport and remove the General Holmes Drive rail level crossing. This will improve traffic flow and access to the airport, Port Botany and, in the future, the WestConnex motorway.

Wilkinson Murray has undertaken construction and operational noise assessments for the Project, the findings of which have been documented in two reports:

- *WestConnex Enabling Works (Airport East) Construction Noise Impact Statement* (dated 28/11/2014); and
- *WestConnex Enabling Works (Airport East) Operational Noise Impact Statement* (dated 06/01/2015).

Since the publication of these reports a further sensitive receiver has been identified - the Ibis Hotel, located on Joyce Drive.

Predicted operational and construction noise levels external to the Ibis hotel have been predicted and are presented in this report.

Results indicate that the operation of the project would not be expected to result in any exceedance of the maximum internal noise level recommended by Australian/New Zealand Standard *AS/NZS 2107:2000*.

Operational noise levels may be expected to increase by less than 1 dB with respect to existing noise levels. Such an increase is unnoticeable to most people, therefore it is considered unlikely the Ibis hotel would experience any notable change in perceived operational noise at commencement of the Project's operation.

During most of the identified construction activities no construction noise impacts are predicted. During the Joyce Drive widening works, however, an exceedance of the maximum internal noise level recommended by *AS/NZS 2107* by up to 11 dB has potential to arise. These works should therefore be managed through the mitigation measures detailed in the Project's noise management plan, as detailed in identified Construction Impact Statement.

