



Transport
for NSW

Heathcote Station Easy Access Upgrade Review of Environmental Factors Transport Access Program



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Abbreviations

AHIMS	Aboriginal Heritage Information Management System
ARI	Average Recurrence Interval
BCA	Building Code of Australia
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CNVMP	Construction Noise and Vibration Management Plan
CPTED	Crime Prevention through Environmental Design
CTMP	Construction Traffic Management Plan
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
DDA	<i>Disability Discrimination Act 1992 (Commonwealth)</i>
DoE	Commonwealth Department of the Environment
DP&E	NSW Department of Planning and Environment
DSAPT	Disability Standards for Accessible Public Transport
ECM	Environment Control Map
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	<i>Fisheries Management Act 1994</i>
Heritage Act	<i>Heritage Act 1977</i>
ICNG	<i>Interim Construction Noise Guideline (Department of Environment and Climate Change, 2000).</i>
Infrastructure SEPP	<i>State Environmental Planning Policy (Infrastructure) 2007</i>
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
MCA	Multi-Criteria Analysis
NEPM	National Environmental Protection Measures
NES	National Environmental Significance

Noxious Weeds Act	<i>Noxious Weeds Act 1993</i>
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales
PAH	Polycyclic Aromatic Hydrocarbons
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
PSNC	Proposal Specific Noise Criteria
OEH	NSW Office of the Environment and Heritage
RailCorp	Rail Corporation of NSW (now Sydney Trains)
RAP	Remediation Action Plan
REF	Review of Environmental Factors (this document)
RBL	Rating Background Level
RMS	Roads and Maritime Services (formerly Roads and Traffic Authority)
SEPP	State Environmental Planning Policy
SRZ	Structural Root Zone
TPD	Transport Projects Division (TfNSW)
TfNSW	Transport for NSW
TCP	Traffic Control Plan
TSC Act	<i>Threatened Species Conservation Act 1995</i>
TPZ	Tree Protection Zone
VAC	Visual Absorption Capacity
VOC	Volatile Organic Compound

Definitions

Concept Design The Concept Design is the preliminary design presented in the REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to TfNSW acceptance).

TfNSW contracts a single entity (the Contractor) to further develop the Reference Design to a level suitable for construction. The Contractor therefore becomes responsible for all work on the project.

Design and Construct Contract A method to deliver a project in which the design and construction services are contracted by a single entity known as the Contractor. The Contractor completes the project by refining the Concept Design presented in the REF (subject to TfNSW acceptance) to be suitable for construction. The Contractor is therefore responsible for all work on the project, both design and construction.

Ecologically Sustainable Development As defined by clause 7(4) Schedule 2 of the EP&A Regulation.

Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.

Feasible A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.

Noise sensitive receiver In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).

Proponent A person or body proposing to carry out an activity under Part 5 of the EP&A Act - in this instance, TfNSW.

Rail possession Possession is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a block of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.

Reasonable Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.

RMS footbridge The new pedestrian footbridge (with lift and stair access) being constructed by RMS to provide access over Princes Highway (separate to the existing footbridge or proposed connecting footbridge that extend over the railway).

Sensitive receivers Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.

Sydney Trains From 1 July 2013, Sydney Trains replaced RailCorp as a new rail operator created to service the different needs of Sydney and intercity customers.

The Proposal The construction and operation of the Heathcote Station Easy Access Upgrade works.

Vegetation Offset Guide The TfNSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 111 of the EP&A Act 1979.

The Guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15cm.

Executive summary

Transport for NSW (TfNSW) is the proponent for the Heathcote Station Easy Access Upgrade (the Proposal). TfNSW is the government agency responsible for the delivery of major transport infrastructure projects in NSW.

The Proposal is part of the Transport Access Program which is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure where it is needed most.

This Review of Environmental Factors (REF) has been prepared to assess the environmental impacts associated with the construction and operation of the Proposal under the provisions of Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Description of the Proposal

The Proposal involves provision of easy access to and accessible parking at Heathcote Station, which is located about 33 kilometres south of Sydney's CBD, in the Sutherland Shire Local Government Area (LGA). The Proposal includes:

- installation of a new pedestrian footbridge and railway overpass, installation of a new lift and stairs, and creation of a new forecourt area and entry to the eastern side of the station
- commuter car parking improvements including new access to the eastern car park from Wilson Parade and provision for accessible parking spaces in both the eastern and western car parks
- provision of improved pedestrian access to the station including new footpaths, pedestrian crossings and links to the Roads and Maritime Services (RMS) pedestrian footbridge over the Princes Highway (the RMS footbridge is due for completion at the end of 2014)
- upgrade of the existing station building with provision for a family accessible toilet
- provision of improved interchange facilities including:
 - additional facilities such as undercover bicycle racks, relocation of existing bicycle lockers and installation of new wayfinding signage
 - kiss 'n' ride areas within both the eastern and western car parks and on the northbound lane of the Princes Highway
 - improvement of existing bus stop along Dillwynnia Grove with provision for upgraded shelter and seating facilities
- demolition of the existing footbridge and ramps currently providing access between Platform 1 (western platform) and Platform 2 (eastern platform).

If approved, construction is expected to commence in 2015 and up to 24 months to complete.

A detailed description of the Proposal is provided in Chapter 3 of this REF.

Need for the Proposal

Improving transport customer experience is the focus of the NSW Government transport initiatives. Transport interchanges, train stations and commuter car parks are important gateways to the transport system and as such play a critical role in shaping the customer experience and perception of public transport.

TfNSW identified the need for improved access at Heathcote Station, which does not currently meet many of the requirements of the Disability Standards for Accessible Public Transport (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA).

Heathcote Station is a key public transport facility in the Sutherland Shire and provides a train stop that services a large catchment for both local and regional commuters. The Proposal is consistent with the aims of the Transport Access Program as it would provide:

- improved accessibility for customers in to Heathcote Station, including provision of an accessible route for the mobility impaired to both station platforms through provision of accessible parking, lifts and footbridge
- a connecting link from the new station footbridge with the footbridge over the Princes Highway (currently being constructed by RMS), to provide public access to both sides of the station and across the Princes Highway
- improving connections with the wider pedestrian network with new pedestrian access along Wilson Parade to the station, and from the Princes Highway through the western car park to the station
- improved and safer traffic flow through the eastern car park through the addition of a new entry access, pedestrian crossings and additional lighting
- improved transport interchange facilities including new kiss 'n' ride zones and bicycle facilities
- improved customer amenity and facilities at the station, including family accessible toilet and canopies for weather protection.

The Proposal is also consistent with key planning strategies in NSW, including *NSW 2021 – Making NSW Number One* (Department of Premier & Cabinet, 2011) and the *NSW Long Term Transport Master Plan* (TfNSW, 2012a).

Options considered

Options for improving access to Heathcote Station were developed following a succession of workshops with TfNSW, relevant stakeholders and the project design team. Three concept design options were developed to address station needs and other design principles and proposed different pedestrian footbridge and lift arrangements. A range of interchange improvements such as improved pedestrian/bicycle access, commuter parking, and passenger drop off and pick up facilities were also developed and were similar for all options. A preferred option was then selected to progress to the next phase of planning. Refer to Section 2.3 for more information on options development.

Statutory considerations

The EP&A Act provides for the environmental impact assessment of development in NSW. Part 5 of the EP&A Act generally specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as TfNSW, which do not require development consent under the EP&A Act.

State Environmental Planning Policy (Infrastructure) 2007 (the Infrastructure SEPP) is the primary environmental planning instrument relevant to the proposed development and is the key environmental planning instrument which determines that this Proposal is permissible without consent and therefore is to be assessed under Part 5 of the EP&A Act.

Clause 79 of the Infrastructure SEPP allows for the development of 'rail infrastructure facilities' by or on behalf of a public authority without consent on any land. Clause 78 defines 'rail infrastructure facilities' as including elements such as 'railway stations, station platforms and

areas in a station complex that commuters use to get access to the platforms', public amenities for commuters' and 'associated public transport facilities for railway stations'.

As TfNSW is a public authority and the proposed activity falls within the definition of rail infrastructure facilities under the Infrastructure SEPP, the Proposal is permissible without consent. Consequently the environmental impacts of the Proposal have been assessed by TfNSW under Part 5 of the EP&A Act.

This REF has been prepared to assess the construction and operational environmental impacts of the Proposal. The REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (the EP&A Regulation).

In accordance with section 111 of the EP&A Act, TfNSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

Chapter 6 of this REF presents the environmental impact assessment of the Heathcote Easy Access Upgrade in accordance with these requirements.

Community and stakeholder consultation

Under the Infrastructure SEPP, consultation is required with local councils or public authorities in certain circumstances, including where Council-managed infrastructure is affected. Consultation has been undertaken with Sydney Trains, RMS and Sutherland Shire Council during the development of design options. Consultation with these stakeholders and others such as the Office of Environment and Heritage (OEH) would continue through the detailed design and construction of the Proposal.

TfNSW is also proposing to undertake the following consultation for the Proposal:

- direct notification to community stakeholders
- public display of the REF.

Community consultation activities for the Proposal would be undertaken during the public display period of this REF. The REF would be displayed for a period of two weeks. Further information about these specific activities is included in Section 5 of this REF.

During this period, the REF would also be available for viewing at the Sutherland Shire Council, Sutherland Library, Engadine Library and the TfNSW Community Information Centre. The REF would also be available to download from TfNSW's website and an information line (1800 684 490) would be available for members of the public to make enquiries.

TfNSW would review and assess all feedback received during the public display period, prior to determining whether or not to proceed with the Proposal.

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure 1 presents an overview of the consultation and planning process and the current status of the Proposal.

Environmental impact assessment

This REF identifies the potential environmental benefits and impacts of the Proposal and outlines the mitigation measures to reduce the identified impacts.

The following key impacts have been identified should the Proposal proceed:

- temporary noise and vibration impacts during construction
- temporary changes to vehicle and pedestrian movements to access the station and car parks during construction
- temporary disruptions to station facilities and amenities during construction
- potential sources of contaminated spoil that would require appropriate management and disposal during construction
- removal of trees/vegetation that would require planting offsets
- introduction of new elements, such as footbridge, into the visual environment
- long term benefits include improved accessibility to the station and enhanced links with the surrounding road and pedestrian network.

Conclusion

This REF has been prepared having regard to sections 111 and 112 of the EP&A Act, and clause 228 of the EP&A Regulation, to ensure that TfNSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The detailed design of the Proposal would also be designed in accordance with the Transport for NSW's *Sustainable Design Guidelines* (TfNSW, 2013a) taking into account the principles of ecologically sustainable development (ESD).

The assessments undertaken have concluded that the Proposal would not have significant impacts to the environment. Should the Proposal proceed, the likely impacts would be appropriately managed in accordance with the mitigation measures outlined in this REF. Accordingly, an environmental impact statement is not required for the Proposal, nor is the approval of the Minister for Planning required. Overall, the Proposal is expected to provide long term benefits for the customers of Heathcote Station and the broader community, which outweigh the short term adverse impacts during construction.



Figure 1: Planning approval and consultation process for the Proposal

1 Introduction

Transport for NSW (TfNSW) is the lead agency for integrated delivery of public transport services across all modes of transport in NSW.

TfNSW is the proponent for the Heathcote Station Easy Access Upgrade (the Proposal), to be delivered by the Transport Projects Division (TPD).

1.1 Overview of the Proposal

1.1.1 Need for the Proposal

The NSW Government is committed to facilitating and encouraging use of public transport, such as trains, by upgrading stations to make them more accessible, and improving interchanges around stations with other modes of transport such as bicycles and cars.

Heathcote Station does not currently provide equitable access to station platforms for the mobility impaired, or meet many of the requirements of the Disability Standards for Accessible Public Transport (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA).

The grade (steepness) of existing ramps leading to the footbridge and platforms are not suitable for the users of wheeled vehicles (bicycles, prams, pushchairs/wheelchairs), those with luggage and the elderly.

The Heathcote Station Easy Access Upgrade is required to improve access to the station and surrounding road/pedestrian network for the mobility impaired, and would improve customer and staff facilities and amenity. The improvements would in turn assist in supporting the growth in public transport use and would provide an improved customer experience for existing and future customers of this station.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- installation of a new pedestrian footbridge and railway overpass, installation of a new lift and stairs, and creation of a new forecourt area and entry to the eastern side of the station
- commuter car parking improvements including new access to the eastern car park from Wilson Parade and provision for accessible parking spaces in both the eastern and western car parks
- provision of improved pedestrian access to the station including new footpaths, pedestrian crossings and links to the RMS pedestrian footbridge over the Princes Highway (the RMS footbridge is due for completion at the end of 2014)
- upgrade of the existing station building with provision for a family accessible toilet
- provision of improved interchange facilities including:
 - additional facilities such as undercover bicycle racks, relocation of existing bicycle lockers and installation of new wayfinding signage
 - kiss 'n' ride areas within both the eastern and western car parks and on the northbound lane of the Princes Highway

- improvement of existing bus stop along Dillwynnia Grove with provision for upgraded shelter and seating facilities
- demolition of the existing footbridge and ramps currently providing access between Platform 1 (western platform) and Platform 2 (eastern platform).

A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF).

Subject to planning approval, construction is expected to commence in 2015 and is anticipated to take up to 24 months to complete.

1.2 Location of the Proposal

The Proposal would involve upgrade works to Heathcote Station which is located about 33 kilometres south of the Sydney CBD in the suburb of Heathcote.

Heathcote is located on the boundary of the Royal National Park within the Sutherland Shire Local Government Area (LGA), (refer Figure 2). Heathcote is generally surrounded by the Royal National Park to the east, south and west, and the suburb of Engadine located to the north of Heathcote.

Heathcote Station is located between the Princes Highway (to the west) and Wilson Parade and the Royal National Park (to the east). The Princes Highway creates a barrier between the Heathcote local centre on the western side and the station on the eastern side.

The station is serviced by the Eastern Suburbs and Illawarra Line, providing train services between Waterfall in the south and Bondi Junction in the east via Central Station. Heathcote Station is the 171st busiest railway station on the Sydney Trains network with an average weekday patronage of 1,620 trips (recorded 2012).

The Proposal site (excluding areas of the road reserve) is located on land owned and managed by Sydney Trains. The area of land where footpath and bus stop works are proposed (i.e. the areas of road reserve along Wilson Parade and Dillwynnia Grove), is managed by Sutherland Shire Council.

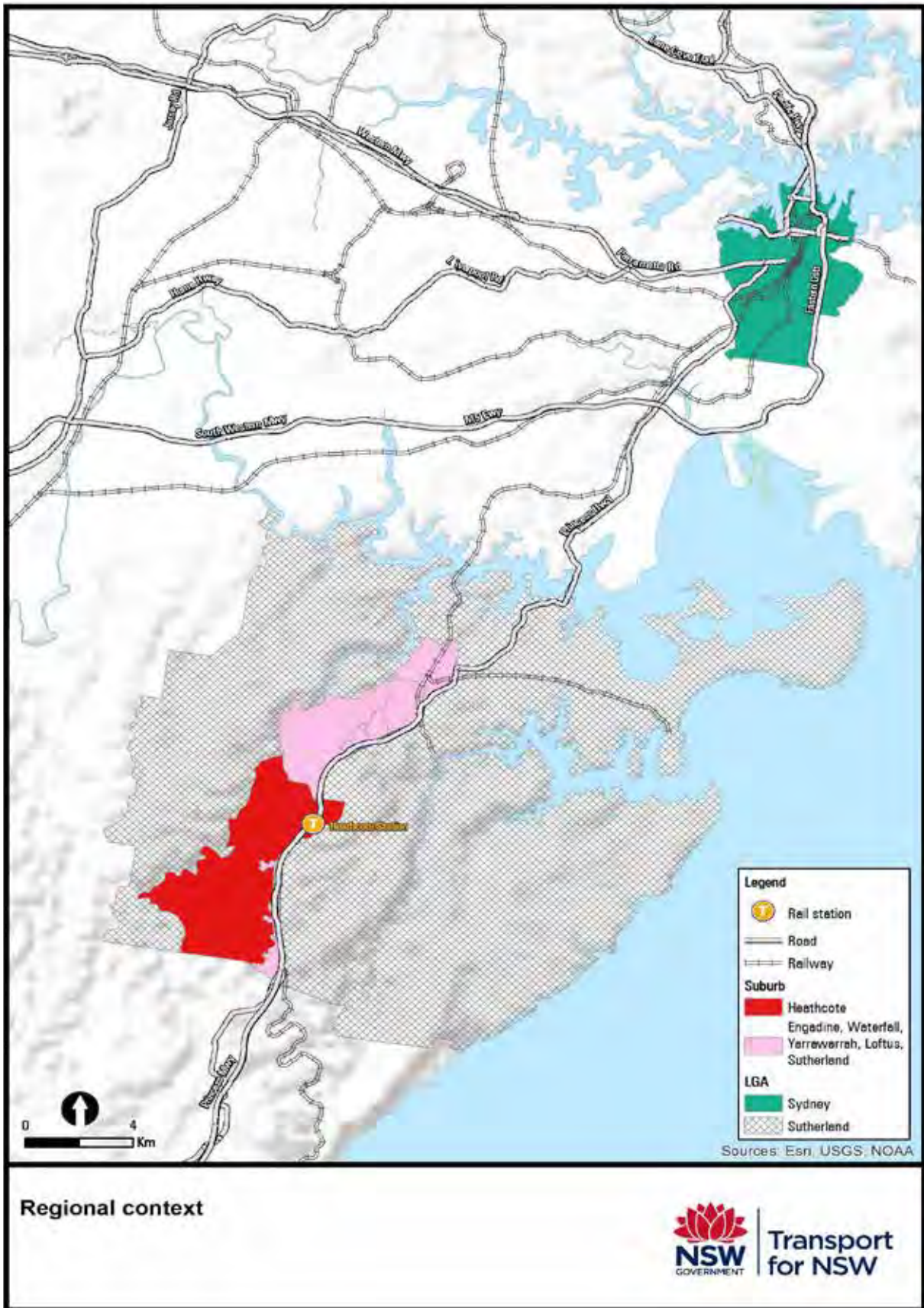


Figure 2: Regional context

1.3 Existing infrastructure and land uses

Land uses adjoining the Proposal predominantly comprise low density residential bounded by the Royal National Park to the east and west sides of the railway and Princes Highway, with the western side of the Princes Highway also providing the commercial/retail centre of Heathcote.

The NSW State Emergency Service facility and Sutherland Shire Emergency Services Centre are located adjacent to the station on the eastern side, accessible from Wilson Parade. Heathcote Public School is located approximately 100 metres to the west of Heathcote Station and Heathcote High School is located approximately 650 metres to the north east of the station (refer Figure 3).

A pedestrian overpass across the Princes Highway is currently being constructed by RMS and which will improve safety and access between the two sides of the highway. The RMS footbridge will comprise a 31-metre span over the highway, just north of the Oliver Street intersection and extend to the station's western car park. Stairs and lifts will be provided on the east and west sides of Princes Highway to enable all users to access the pedestrian footbridge.

Heathcote Station consists of two single-sided platforms with two tracks providing services on the Eastern Suburbs and Illawarra line. Platform 1 (western platform) provides services that are city bound and Platform 2 (eastern platform) provides services that travel to Waterfall. There is direct access to Platforms 1 and 2 from each side of the station and a pedestrian ramp and footbridge over the railway corridor currently connects the eastern and western sides of the station.

Existing transport interchange arrangements available at Heathcote Station include:

- commuter car parking on both the eastern and western sides of the station, providing around 60 and 90 parking spaces respectively
- two bus routes operated by Transdev which service the station, consisting of route 991 (operating between Waterfall Station and Sutherland) and route 996 (operating between Engadine and Heathcote)
- bicycle locker storage.

There is no formal taxi rank or kiss 'n' ride facilities currently provided at Heathcote Station.

Photographs of the existing station are provided in Images 1 to 8.

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by TfNSW to assess the potential impacts of the proposed station easy access upgrade works to Heathcote Station. For the purposes of these works, TfNSW is the proponent and the determining authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this REF is to describe the Proposal, to assess the likely impacts of the Proposal having regard to the provisions of section 111 of the EP&A Act, and to identify mitigation measures to reduce the likely impacts of the Proposal. This REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (the EP&A Regulation).

This assessment has also considered the relevant provisions of other relevant environmental legislation, including the *Threatened Species Conservation Act 1995* (TSC Act), *Fisheries Management Act 1994* (FM Act) and the *Roads Act 1993* (Roads Act).

Having regard to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this REF considers the potential for the Proposal to significantly impact a matter of national environmental significance (NES) or Commonwealth land and the need to make a referral to the Commonwealth Department of Environment for any necessary approvals under the EPBC Act. Refer to Section 4 for more information on statutory considerations.



Site locality



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Figure 3: Site locality



Image 1: View looking west towards the existing eastern car park and station entrance



Image 2: View from platform looking west towards the existing station operation area and associated building



Image 3: View looking north from the eastern platform showing existing pedestrian overpass



Image 4: View of the existing platforms looking south from the existing pedestrian overpass



Image 5: View of the existing eastern car park looking south



Image 6: View of the existing western car park



Image 7: View looking south of the proposed location of the extended eastern car park



Image 8: Existing pathway providing entrance to Heathcote Station from Princes Highway

2 Need for the Proposal

Chapter 2 discusses the need and objectives of the Proposal, having regard to the objectives of the Transport Access Program and the specific objectives of the Proposal. This chapter also provides a discussion of the options that have been considered during development of the Proposal and why the preferred option has been chosen.

2.1 Strategic justification

Improving transport customer experience is the focus of the NSW Government's transport initiatives. Transport interchanges and train stations are the important gateways to the transport system and as such play a critical role in shaping the customer's experience and perception of public transport.

The Proposal forms part of the Transport Access Program. This program is designed to drive a stronger customer experience to deliver seamless travel to and between modes, encourage greater public transport use and better integrate station interchanges with the role and function of town centres within the metropolitan area and developing urban centres in regional areas of NSW.

The Proposal is consistent with the NSW Government's commitment to deliver an efficient and effective transport system around Sydney and NSW as detailed in *NSW 2021 – A Plan to Make NSW Number One* (Department of Premier and Cabinet, 2011).

NSW 2021 is the NSW Government's ten year plan to guide budget and decision making in NSW. NSW 2021 includes the following goals, targets and priority actions relevant to the Proposal:

- reduce travel times
- minimise public transport waiting times for customers
- improve co-ordination and integration between transport modes
- grow patronage on public transport
- improve public transport reliability
- improve customer experience with transport services.

The NSW Government has developed the *Long Term Transport Master Plan* (TfNSW, 2012b). The plan provides a clear direction for transport over the next 20 years, while building on current commitments.

The Long Term Transport Master Plan (TfNSW, 2012b) complements and builds on the visions and goals established in NSW 2021 and this Proposal would support growth and improvements in the safe and efficient management of transport in the Sydney region.

The 2012-2017 Disability Action Plan (TfNSW, 2012c) was developed by TfNSW in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Disability Action Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job, and provides a solid and practical foundation for future progress over the next five years. The Proposal has been developed in consideration of the objectives outlined in this Plan.

Rebuilding NSW - State Infrastructure Strategy 2014 is a plan to deliver \$20 billion in new productive infrastructure to sustain productivity growth in our major centres and regional communities (NSW Government, 2014). Rebuilding NSW will support overall population growth in Sydney and NSW.

Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal. The Proposal supports massive investment in rail infrastructure, and aligns with the reservation of \$8.9 billion for urban public transport to support Sydney's population, that is expected to reach almost six million by 2031.

Further details of the application of NSW Government policies and strategies are discussed in Section 4.5 of this REF.

2.1.1 Objectives of the Transport Access Program

The Transport Access Program is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure where it is needed most. The program aims to provide:

- stations that are accessible to those with disabilities, the ageing and parents/carers with prams
- modern buildings and facilities for all modes that meet the needs of a growing population
- modern interchanges that support an integrated network and allow seamless transfers between all modes for all customers
- safety improvements including extra lighting, lift alarm, fences and security measures for car parks and interchanges, including stations, bus stops and wharves
- signage improvements so customers can more easily use public transport and transfer between modes at interchanges
- other improvements and maintenance such as painting, new fencing and roof replacements.

2.1.2 Objectives of the Proposal

The specific objectives of the Heathcote Station Easy Access Upgrade are to:

- provide a station that is accessible to those with disabilities, the ageing and parents/carers with prams
- improve customer and staff facilities
- improve customer amenity
- improve the transport interchange area with enhanced connections to adjacent road and pedestrian network (including links to the RMS footbridge across the Princes Highway currently under construction).

2.2 Design development

An assessment of Heathcote Station was undertaken to identify key deficiencies and opportunities at Heathcote Station with regards to accessibility and the customer experience. The findings were presented in AECOM's Concept Plan Project report and are summarised in Table 1.

As noted in Section 1.1.1 of this REF, the grade (steepness) of existing ramps leading to the existing footbridge and platforms are not suitable for the mobility impaired. Other deficiencies include:

- non-compliant platform levels (i.e. leading to a height gap between the platform and train vestibule floor)
- non-compliant pathways to station entrance and platforms
- non-compliant ticket window for customers with a disability
- no formal kiss 'n' ride areas
- lack of separation between vehicles and pedestrians in eastern car park
- limited weather protection from existing canopies along platforms, footbridge and ramps.

The needs and opportunities identified for Heathcote Station were then considered in the development of the concept design options (refer to Section 2.3). The expected increase in customers (about 46 percent over the next 25 years) was also taken into account during design development.

Table 1: Heathcote Station needs and opportunities

Assessment area	Needs	Opportunities
DDA / DSAPT	<ul style="list-style-type: none"> • Accessible ticket facilities • Accessible pathway between station entrance and platforms • Accessible pathway to and from interchange facilities 	<ul style="list-style-type: none"> • Installation of lift/s at platforms • Provide accessible ticket windows • Provide family accessible toilet
Platform height	<ul style="list-style-type: none"> • Level platform for train transfer 	<ul style="list-style-type: none"> • Regrade platform to provide level access
Station facilities	<ul style="list-style-type: none"> • Need for a family accessible toilet • Additional signage to improve wayfinding • Additional canopy coverage 	<ul style="list-style-type: none"> • Incorporate improved station operation area into concept plan
Pedestrian facilities	<ul style="list-style-type: none"> • Modal separation at eastern car park 	<ul style="list-style-type: none"> • Provide clear footpath and crossing at eastern car park
Bus stop facilities	<ul style="list-style-type: none"> • Safe and accessible connection to bus stop 	<ul style="list-style-type: none"> • Provide an accessible footpath to bus stop • Provide bus shelter and seating
Cyclist facilities	<ul style="list-style-type: none"> • Cycle storage / parking facilities under shelter 	<ul style="list-style-type: none"> • Provide undercover bicycle storage facilities • Relocate existing bicycle lockers
Kiss 'n' ride	<ul style="list-style-type: none"> • Formal kiss 'n' ride zones 	<ul style="list-style-type: none"> • Provide safe and efficient kiss 'n' ride areas

2.3 Alternative options considered

Options for improving access to Heathcote Station were developed following a succession of workshops with TfNSW, and in consultation with other relevant stakeholders (including representatives from Sydney Trains, RMS and Sutherland Shire Council). Three concept design options were developed to address station needs and other design principles; and these are outlined in Section 2.3.1.

A range of interchange improvements such as improved pedestrian/bicycle access, commuter parking, and passenger drop off and pick up facilities were also developed. These were consistent across each of the station options and so were not considered as part of the options assessment.

2.3.1 Identified options

Option 1 – New pedestrian footbridge and single lift/stairs

Key features of Option 1 include:

Western side (Princes Highway)

- extension of RMS footbridge over the rail corridor to provide access to Platform 2 (eastern platform)
- provision of an accessible path from the RMS footbridge landing to Platform 1 (western platform)
- modifications to the existing station operating area.

Eastern side (Wilson Parade)

- provision of new lift and stairs to provide access from the extended footbridge to Platform 2
- creation of a new forecourt area outside Platform 2
- provision of compliant access (stairs and ramp) between Platform 2 and interchange.

This option would also include the demolition of the existing ramps and footbridge structure.

Option 2 – Existing pedestrian footbridge with new lifts and accessible footpaths

Key features of Option 2 include:

- installation of new lifts connecting to the existing footbridge, including lift access to both Platform 1 and Platform 2
- provision of connecting accessible paths between proposed lifts, RMS footbridge stair landing and station entrance
- modifications to the existing station operating area.

This option would retain the existing ramps and pedestrian footbridge structure.

Option 3 – New pedestrian footbridge and additional lifts

Option 3 would provide a similar design to Option 1 with the addition of a second lift and staircase at the western entrance to provide access to Platform 1 of the station. Key features of Option 3 include:

Western side (Princes Highway)

- extension of RMS footbridge over the rail corridor to provide access to Platform 2
- provision of an accessible path from the RMS footbridge landing to Platform 1
- provision of a new lift and stairs to provide access from the extended footbridge to Platform 1
- modifications to the existing station operating area.

Eastern side (Wilson Parade)

- provision of new lift and stairs to provide access from extended footbridge to Platform 2
- creation of a new forecourt area outside Platform 2
- provision of compliant access (stairs and ramp) between Platform 2 and interchange.

This option would also include the demolition of the existing ramps and footbridge structure.

The do-nothing option

The NSW Government has identified the need for improving the accessibility of transport interchanges, train stations and commuter car parks across NSW as a priority under the Transport Access Program.

The 'do nothing' option was not considered a feasible alternative as it is inconsistent with NSW Government objectives and would not help encourage the use of public transport and would not meet the immediate needs of the Heathcote community.

Assessment of identified options

Each concept design option was compared against a range of aspects including DDA and Building Code of Australia compliance, services, customer circulation, constructability and cost. Each option offered a feasible, practical and buildable solution to improve accessibility at Heathcote Station. Due to this all options were taken forward to undergo a multi-criteria analysis (MCA) to select a preferred option.

2.4 Justification for the preferred option

Based on the analysis undertaken, Option 3 received the highest score and was perceived to be marginally better than Option 1 for the included criteria. Option 1 and Option 3 received the same scores in terms of precinct integration, modal integration and engineering constraints, however Option 3 scored higher in customer experience and accessibility (mainly due to the provision of additional lift).

Option 2 was ranked as the least preferred option as the retention of the existing footbridge did not enhance the pedestrian links between Wilson Parade and the Princes Highway, through a connection with the RMS footbridge.

Both Options 1 and 3 ranked strongly in the MCA, and TfNSW selected Option 1 as the preferred option to be taken forward for further development and refinement. A key reason for this was that a new lift/stairs are already being installed on the western side

as part of the RMS footbridge and would be able to be used by the mobility impaired to access the new footbridge and eastern side of the station. An additional lift/stairs on the western side as proposed in Option 3 is not considered viable at this time due to the low patronage of the station but could be investigated as part of any future upgrades.

The preferred option – Option 1 New pedestrian footbridge and single lift/stairs – and associated interchange facilities would greatly enhance the accessibility of Heathcote Station and satisfy the objectives of the Transport Access Program and is described in more detail in Chapter 3.

3 Description of the Proposal

Chapter 3 describes the Proposal and summarises key design parameters, construction method, and associated infrastructure and activities. The description of the Proposal is based on the concept design at the time of preparing this REF and is subject to additional design refinement and detailed design.

3.1 The Proposal

As described in Section 1.1, the Proposal involves an easy access upgrade of Heathcote Station as part of the Transport Access Program.

The Proposal would provide a number of improved features to provide an accessible station and improved interchange facilities. The Proposal would include the following key elements:

- installation of a new pedestrian footbridge and railway overpass, installation of a new lift and stairs, and creation of a new forecourt area and entry to the eastern side of the station
- commuter car parking improvements including new access to the eastern car park from Wilson Parade and provision for accessible parking spaces in both the eastern and western car parks
- provision of improved pedestrian access to the station including new footpaths, pedestrian crossings and links to the RMS pedestrian footbridge over the Princes Highway (the RMS footbridge is due for completion at the end of 2014)
- upgrade of the existing station building with provision for a family accessible toilet
- provision of improved interchange facilities including:
- additional facilities such as undercover bicycle racks, relocation of existing bicycle lockers and installation of new wayfinding signage
- kiss 'n' ride areas within both the eastern and western car parks and on the northbound lane of the Princes Highway
- improvement of existing bus stop along Dillwynnia Grove with provision for upgraded shelter and seating facilities
- demolition of the existing footbridge and ramps currently providing access between Platform 1 (western platform) and Platform 2 (eastern platform).

Figure 4 shows the general layout of the Proposal, and Figure 5 and Figure 6 provide indicative elevations of the Proposal.

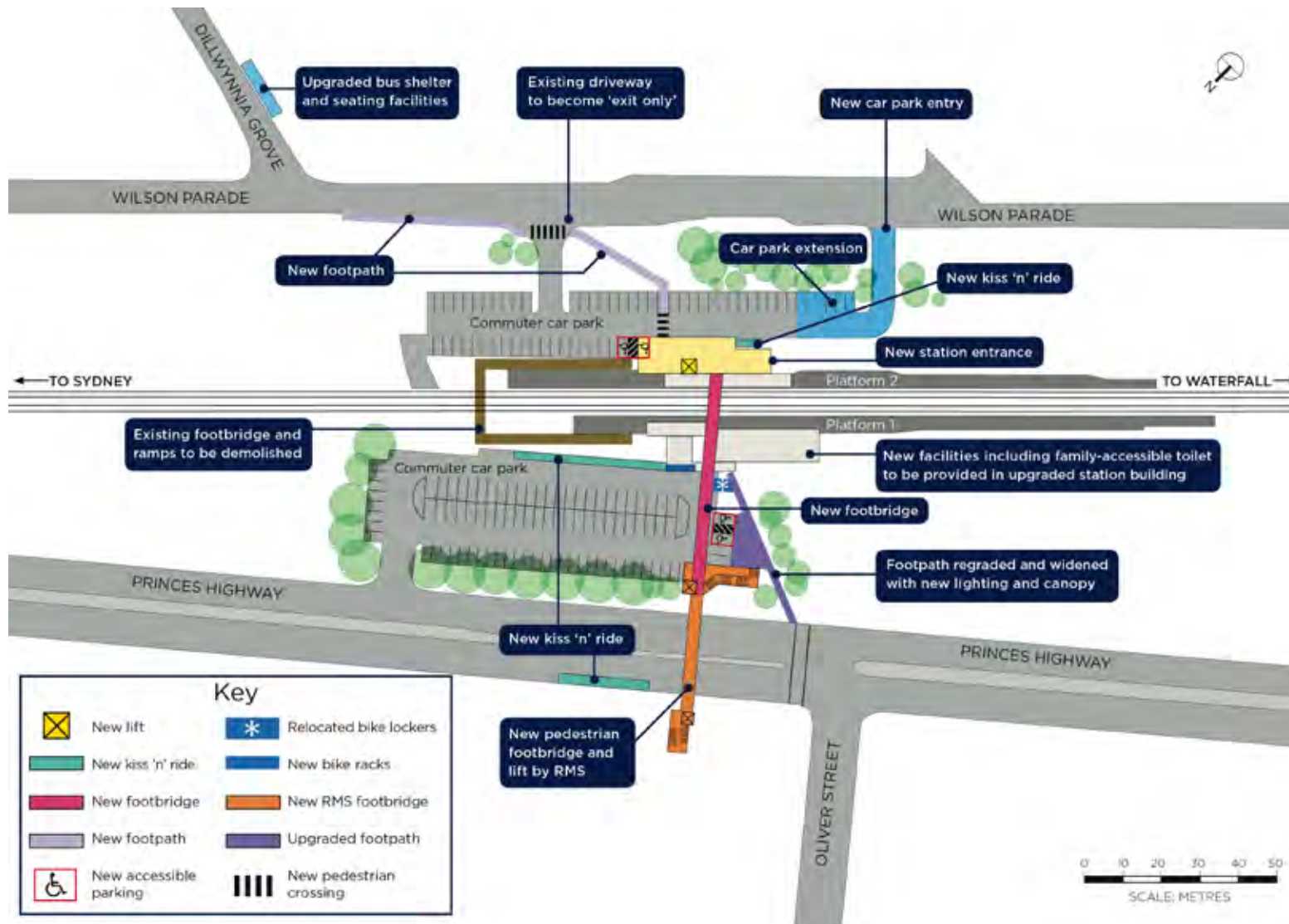


Figure 4: Plan view of the Proposal

Note: Image is indicative only. Subject to detailed design.



Figure 5: Section of Proposal looking towards eastern side of station

Note: Image is indicative only (AECOM, 2013). Subject to detailed design.



Figure 6: Elevation of Proposal looking north

Note: Image is indicative only (AECOM, 2013). Subject to detailed design.

3.1.1 Design features

Pedestrian footbridge, lift and station entry

On the eastern side of the station, a new forecourt area with a weather protection canopy, a kiss 'n' ride area and accessible ramps would be installed to provide access to Platform 2.

A new lift and covered staircase would be erected on the eastern side to provide access to a new covered footbridge extending over the railway line and connecting to the RMS footbridge that extends across the Princes Highway to Byrnes Lane.

Pedestrians on the eastern side of the rail line wishing to access Platform 1 or the western car park would be able to utilise the new covered footbridge, then the RMS lift/stairs, cross the car park and enter the station at the existing ground level entrance from the western side. Pedestrians may also continue across the pedestrian footbridge to the Princes Highway.

The new footbridge could be utilised by the greater community and not just rail customers as paid access would remain at the ground-level platform entrances.

Commuter car parking

The eastern car park is currently accessible from one entry/exit point from Wilson Parade. As part of the Proposal, a new entry to the car park would be provided further south on Wilson Parade and the car park would be converted to one-way directional flow, with the existing access point converted to exit only (refer Figure 4).

To facilitate the new entry and to replace the existing parking spaces to be lost by the upgrade works, the eastern car park would be extended to the south to include approximately seven parking spaces. The two existing accessible parking spaces would be relocated to a shared central area to provide access and egress space, adjoining the new forecourt area. New lighting would also be provided within the extended area of the car park.

The existing western car park, accessible from the Princes Highway would be modified with the existing staff parking in the proposed kiss 'n' ride zone to be relocated within the car park. The two existing accessible parking spaces would be relocated to a shared central area providing access and egress space.

Accessible pedestrian facilities

The Proposal would provide improvements to pedestrian footpaths within the Heathcote Station site and some surrounding areas. This would facilitate safe, accessible footpaths for both station entrances.

Pedestrian facilities that would be provided as part of the Proposal would include (refer Figure 4):

- a new footpath would be provided on the eastern side of Heathcote Station and along the western side of Wilson Parade to provide a continuous path to the bus stop located on Dillwynnia Grove. The new footpath would generally be located between the new station entrance and the corner of Dillwynnia Grove and Wilson Parade. The footpath would include two formalised pedestrian crossings, including at the car park exit onto Wilson Parade to improve pedestrian safety

- widening and resurfacing of existing footpaths within the western car park area
- additional lighting would be provided along footpaths, with some additional canopy protection provided for the footpath between Princes Highway and Heathcote Station.

Upgrade of existing station operation building

The Proposal would include an upgrade and extension of the existing station operation building located adjacent to Platform 1. The proposed works would include the following:

- upgraded toilet facilities, including the provision of a new family accessible toilet
- reconfiguration of the existing ticket window, station masters office and other staff facilities
- new communications room and switch room.

In order to accommodate the proposed changes to the station building, the existing two buildings located on Platform 2 would be combined and extended to the south to form one building. The internal structure of the existing buildings would then be reconfigured to accommodate the upgraded station operation building facilities.

Improved interchange facilities

A number of interchange facilities would be upgraded as part of the Proposal. These include station elements such as bicycle facilities, passenger pick up and drop off facilities and other interchange facilities (refer also to Figure 4).

Bicycle facilities

- The existing bicycle lockers located at the northern end of the western car park would be relocated to a location closer to the station entrance.
- Undercover bicycle racks would be provided within the forecourt of the new eastern station entry and near the western station entry.

Passenger drop off and pick up

- A peak hour kiss 'n' ride area would be established (through the provision of formal signage) for northbound traffic along the Princes Highway (western side of Princes Highway) to the north of the intersection of Princes Highway and Oliver Street.
- A new kiss 'n' ride area would be provided within the forecourt of the new eastern station entry and would be connected to Platform 2 via an accessible pathway.
- A new kiss 'n' ride area would be established immediately north of the western station entrance and would be connected to Platform 1 via an accessible pathway.

Bus facilities

- The existing bus stop on Dillwynnia Grove would be improved, including provision of an upgraded shelter and seating facilities.

Other infrastructure

- Lighting and new /additional wayfinding signage would be provided.

Demolition of existing footbridge

The Proposal would include the removal of the existing footbridge and ramps currently providing access between Platform 1 and Platform 2. As part of the removal of the existing footbridge and ramps, the existing overhead wiring currently attached to the underside of the bridge structure would be relocated with stand alone poles on the outside of the alignment of the railway tracks.

Upgrade of services

An upgrade to the existing power supply is required to accommodate the new lift and associated station building facilities. At the station, a new installation main switchboard would need to be provided. In addition, new security cameras would be installed along with other services such as water, fire protection and new fencing.

3.1.2 Engineering constraints

There are a number of constraints which have influenced the development of the design of the proposed upgrade.

Existing structures: the placement and integrity of existing structures needed to be considered during the development of the design. These structures include the platform and station operations building.

Sydney Trains requirements: structures built within 20 metres of an existing rail line must be built with regard to train impact load.

RMS footbridge: new railway footbridge for the Proposal to be designed to integrate with pedestrian footbridge currently under construction.

Utilities: A preliminary Dial Before You Dig (DBYD) search has identified a number of utilities in the vicinity of the proposed works including:

- water
- sewer
- electricity
- communication cabling
- traffic signalling
- gas pipeline
- rail utilities.

3.1.3 Design standards

The Proposal has been designed having regard to the following:

- RailCorp Business Requirements
- RailCorp Station Design Standards
- Transport for NSW *Sustainable Design Guidelines – Version 3.0* (TfNSW, 2013a)
- Disability Standards for Accessible Public Transport (2002) (issued under the *Commonwealth Disability Discrimination Act 1992*)
- Relevant Australian Standards, including AS 2890.1
- Crime Prevention through Environmental Design (CPTED) principles
- Building Code of Australia
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008).

3.1.4 Sustainability in design

The detailed design of the Proposal would be undertaken in accordance with the project targets identified in TfNSW's Environmental Management System (EMS) and the *Sustainable Design Guidelines - Version 3.0* (TfNSW, 2013a) which groups sustainability into seven themes:

- energy and greenhouse gases
- climate resilience
- materials and waste
- biodiversity and heritage
- water
- pollution control
- community benefit.

Within each theme, potential initiatives are prioritised into two categories of requirements:

- Compulsory – the initiative is required to be implemented when applicable to the project as they refer to a corporate target, or are fundamental to the delivery of sustainable assets).
- Discretionary – the initiative has benefits to be implemented, however may not be the most appropriate.

The Guidelines also specify a minimum level of compliance within each category: 100 percent of applicable Compulsory initiatives and 50 percent of the applicable Discretionary points are to be explored through each stage of design.

3.2 Construction activities

3.2.1 Work methodology

Construction is expected to commence in 2015 and take up to 24 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with TfNSW.

The proposed construction activities for the Proposal are identified in Table 2. This staging is indicative and is based on the current preliminary design and may change once the detailed design methodology is finalised.

Table 2: Likely construction stages

Activity
<p>Site establishment and enabling works</p> <ul style="list-style-type: none"> • Establishment of site compound (erect hoarding, site offices, amenities and plant/material storage areas etc). • Establishment of temporary station entrances and access paths to existing platforms, and temporary booking office. • Removal of vegetation in western car park to allow for new footbridge, and in eastern car park for car park extension and new entry. • Services relocation, including diversion of the existing overhead wires from underneath the existing footbridge and relocation of existing electrical high voltage pole in the eastern car park, if required.
<p>Excavation works</p> <ul style="list-style-type: none"> • Excavations and foundations for new station footbridge, lift and stairs. Access to Platform 2 and use of the existing ramps to be maintained during construction. • Temporary overhead wire adjustments would be required to allow for construction of the pedestrian footbridge.
<p>Structural works</p> <ul style="list-style-type: none"> • Structural works for stairs and columns and installation of bridge beams (including modification to the RMS footbridge to accommodate the new footbridge). • Construction of new lift shaft and lift installation. • Construction of new station entrance and canopy. • Upgrade and extension works for the station operations building. • Installation of all roofing, screens and canopy for lift/stairs and footbridge. • Installation of fixtures, lighting and systems.
<p>Interchange works</p> <ul style="list-style-type: none"> • Construction of car park, kiss 'n' ride areas (including on Princes Highway), accessible car parking spaces and footpaths. • Installation of undercover bicycle racks and relocation of existing bicycle lockers. • Construction of new bus shelter and seat at Dillwynnia Grove. • Electrical upgrade works.
<p>Demolition</p> <ul style="list-style-type: none"> • Demolition of existing ramps and footbridge. • Undertake final overhead wire adjustments.
<p>Testing and commissioning</p>

3.2.2 Plant and equipment

A list of plant and equipment that would likely be used in the construction of the Proposal is provided below:

- Trucks
- Air compressor
- Compactor
- Piling rig
- Concrete pump
- Smooth drum roller
- Concrete truck
- Concrete saw
- Paving machine
- Generators
- Water truck
- Line marking plant
- Grinder
- Mobile cranes
- Hand tools
- Bobcat
- Concrete vibrator
- Elevated work platform
- Jack hammer
- Air compressor
- Small vehicles
- Excavators
- Front end loader
- Lighting towers.

3.2.3 Working hours

The majority of works required for the Proposal would be undertaken during standard (NSW) Environment Protection Authority (EPA) construction hours, which are as follows:

- 7.00 am to 6.00 pm Monday to Friday
- 8.00 am to 1.00 pm Saturdays
- no work on Sundays or public holidays.

Certain works may need to occur outside standard hours and would include night works and works during routine track possessions which are scheduled closures that would occur regardless of the Proposal when part of the rail network is temporarily closed and trains are not operating.

Out of hours works are often required to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets. There are typically four weekend possessions scheduled each year and given construction is estimated at 24 months it is likely that activity may be required for up to around eight possession periods to facilitate the following:

- installation of lift
- installation of stairs, footbridge sections and canopy
- any overhead wiring works and associated adjustments
- demolition of existing pedestrian footbridge
- cutover for new power supply, testing and commissioning.

Approval from TfNSW would be required for out of hours work and the affected community would be notified as outlined in TfNSW's *Construction Noise Strategy* (TfNSW, 2012b) (refer to Section 6.3 for further details).

3.2.4 Earthworks

The Proposal would require a small amount of earthworks. Excavations and earthworks would generally be required for the following:

- the pit for proposed lift shaft which may require an open cut excavation through the station platform

- footings for the new pedestrian footbridge, stairs and forecourt entrance canopy
- construction of the eastern car park extension and new car park entrance
- construction of the extended station building on Platform 1
- construction of the new and widened footpaths within the Heathcote Station site and the footpath along Wilson Parade to Dillwynnia Grove.

Excavated material would be reused onsite where possible or disposed of in accordance with relevant legislative requirements.

3.2.5 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal, and would consider the requirements of the TfNSW *Sustainable Design Guidelines – Version 3.0* (TfNSW, 2013a). Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.2.6 Traffic access and vehicle movements

Traffic and transport impacts associated with the Proposal are assessed in detail in Section 6.1 of this REF.

The potential traffic and access impacts expected during the construction of the Proposal include:

- disruptions to customer access to the station and the need for temporary access arrangements
- disruptions to vehicle and pedestrian movements along Wilson Parade and Princes Highway
- disruptions to vehicle and pedestrian movements into the car parks and along footpaths
- temporary loss of parking during construction
- construction vehicle movements and access arrangements.

A detailed construction methodology and associated management plans (such as a Construction Environmental Management Plan (CEMP)) would be developed during the detailed design phase of the Proposal to manage impacts.

3.2.7 Ancillary facilities

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. An area for a construction compound has been proposed on the eastern side of Heathcote Station towards the northern end of the existing car park. This land is owned by Sydney Trains and is accessible via Wilson Parade (refer Figure 7). Impacts associated with utilising this area have been considered in the environmental impact assessment including requirements for rehabilitation.

3.2.8 Public utility adjustments

As part of the removal of the existing footbridge and ramps, the existing overhead wiring currently attached to the underside of the bridge structure would be relocated to separate, stand alone poles on the outside of the alignment of the railway tracks. The location of the poles would be determined during detailed design, however the wires would be in a similar location to their current location.

An existing high voltage line overpasses the eastern car park and an existing pole would need to be relocated to allow for the new station entry and lift/footbridge works to ensure adequate horizontal clearance. It is proposed the pole is replaced and relocated further away from the station (e.g. into a parking space).

A range of other utilities are located on or adjacent to the Proposal site. A utility investigation, including DBYD enquiries, has been undertaken during preliminary design stages as discussed in Section 3.1.2.

Further investigation may be required, although the Proposal has been designed to avoid relocation of services where feasible. It is likely some services may require relocation but such relocation is unlikely to occur outside of the footprint of the works assessed in this REF. In the event that works would be required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.



Figure 7: Location of proposed works and construction compound

3.3 Property acquisition

TfNSW does not propose to acquire any property as part of the Proposal.

3.4 Operational management and maintenance

The management and maintenance of Heathcote Station would continue to be the responsibility of Sydney Trains.

The management and maintenance of the new footpath along Wilson Parade and bus stop infrastructure at Dillwynia Grove would be the responsibility of Sutherland Shire Council.

4 Statutory considerations

Chapter 4 provides a summary of the statutory considerations relating to the Proposal including a consideration of NSW Government policies/strategies, NSW legislation (particularly the EP&A Act), environmental planning instruments (EPIs), and Commonwealth legislation.

4.1 Commonwealth legislation

4.1.1 *Environment Protection and Biodiversity Conservation Act 1999*

The (Commonwealth) EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as 'matters of National Environmental Significance (NES)'. The EPBC Act requires the assessment of whether the Proposal is likely to significantly impact on matters of NES or Commonwealth land. These matters are considered in full in Appendix 2.

The Proposal would not impact on any matters of NES or on Commonwealth land. Therefore a referral to the Commonwealth Minister for the Environment is not required.

4.2 NSW legislation and regulations

4.2.1 *Environmental Planning and Assessment Act 1979*

The EP&A Act establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of Part 5 of the EP&A Act. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as TfNSW, which do not require development consent under Part 4 of the Act.

In accordance with section 111 of the EP&A Act, TfNSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal. Having regard to these provisions, TfNSW has determined that no significant environmental impact is likely, and as a consequence an environmental impact statement is not required, nor is the approval of the Minister for Planning.

Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Part 5 of the EP&A Act has a significant impact on the environment.

Chapter 6 of this REF provides an environmental impact assessment of the Proposal in accordance with clause 228. Appendix 1 specifically responds to the factors for consideration under clause 228.

4.2.3 Other NSW legislation and regulations

Table 3 provides a list of other relevant legislation applicable to the Proposal.

Table 3: Other relevant legislation applicable to the Proposal

Applicable legislation	Considerations
<i>Contaminated Land Management Act 1997</i> (CLM Act) (NSW)	<p>Section 60 of the CLM Act imposes a duty on landowners to notify OEH, and potentially investigate and remediate land if contamination is above EPA guideline levels.</p> <p>The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.8).</p>
<i>Crown Lands Act 1987</i> (NSW)	The Proposal does not involve works on any crown land.
<i>Disability Discrimination Act 1992</i> (DDA Act) (Commonwealth)	The Proposal has been designed having regard to the requirements of this Act.
<i>Fisheries Management Act 1994</i> (NSW)	<p>Storm water quality measures would be implemented during construction to prevent any adverse impacts to any natural watercourse.</p> <p>The Proposal would not affect any listed threatened species, marine vegetation or involve dredging or dam works.</p>
<i>Heritage Act 1977</i> (Heritage Act) (NSW)	<p>Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted.</p> <p>Sections 139 and 140 (permit) where relics are likely to be exposed.</p> <p>Section 170 where items listed on a government agency Heritage and Conservation Register are to be impacted.</p> <p>Heathcote Railway Station is not listed on the State Heritage Register or Section 170 Heritage and Conservation Registers. No heritage approvals are required under the Heritage Act.</p>
<i>National Parks and Wildlife Act 1974</i> (NPW Act) (NSW)	<p>Sections 86, 87 and 90 require consent from OEH for the destruction or damage of Indigenous objects. The Proposal is unlikely to disturb any Indigenous objects (refer Section 6.4).</p> <p>However, if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Proposal, all works would cease and appropriate advice sought.</p>
<i>Noxious Weeds Act 1993</i> (NSW)	There are three listed noxious weeds in the Proposal area including one of Weed of National Significance (Lantana). Appropriate management methods would be implemented during construction (refer Section 6.7).
<i>Protection of the Environment Operations Act 1997</i> (PoEO Act) (NSW)	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an environment protection licence (EPL) is not required for the Proposal. However, in accordance with Part 5 of the PoEO Act, TfNSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor.

Applicable legislation	Considerations
<i>Roads Act 1993</i> (Roads Act) (NSW)	<p>Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads.</p> <p>Works are proposed to be undertaken on Wilson Parade and Dillwynnia Grove which are both are unclassified roads, and would not require consent.</p> <p>However some works may be required on the Princes Highway, which is a classified road and the proposed works may require approval from RMS.</p>
<i>Sydney Water Act 1994</i> (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
<i>Threatened Species Conservation Act 1995</i> (NSW)	The site does not contain suitable habitat for any listed threatened species or community and is unlikely to have a significant impact on any threatened species or community (refer Section 6.7).
<i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act) (NSW)	TfNSW would carry out the Proposal having regard to the requirements of the WARR Act. A site specific Waste Management Plan would be prepared.
<i>Water Management Act 2000</i> (NSW)	The Proposal would not involve any water use, water management works, drainage or flood works, controlled activities or aquifer interference.

4.3 State Environmental Planning Policies

4.3.1 State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP is the key environmental planning instrument which determines the permissibility of the Proposal and which part of the EP&A Act an activity or development may be assessed.

Clause 79 of the Infrastructure SEPP allows for the development of 'rail infrastructure facilities' by or on behalf of a public authority without consent on any land (ie assessable under Part 5 of the EP&A Act). Clause 78 defines 'rail infrastructure facilities' as including elements such as 'railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms', public amenities for commuters' and 'associated public transport facilities for railway stations'.

Consequently, development consent is not required for the Proposal which is classified as a rail infrastructure facility, however the environmental impacts of the Proposal have been assessed under the provisions of Part 5 of the EP&A Act.

Part 2 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other agencies prior to the commencement of certain types of development. Section 5.2 of this REF discusses the consultation undertaken under the requirements of the Infrastructure SEPP.

It is noted that the Infrastructure SEPP prevails over all other environmental planning instruments except where *State Environmental Planning Policy (Major Development) 2005*, *State Environmental Planning Policy No 14 – Coastal Wetlands* or *State Environmental Planning Policy No 26 – Littoral Rainforest* applies. The Proposal does not require consideration under these SEPPs and therefore do not require further consideration as part this REF.

4.3.2 State Environmental Planning Policy 19 – Bushland in Urban Areas

SEPP 19 – Urban Bushland applies to bushland within the urban areas identified in Schedule 1 of the SEPP, which includes the Sutherland Shire LGA in which the Proposal is located. The aim of SEPP 19 is to protect and preserve bushland for its natural heritage aesthetic, recreational, educational and scientific resource values. Clause 7 of SEPP 19 requires public authorities (i.e. TfNSW as the proponent) to have regard for the aims of the policy before deciding to disturb any remnant bushland.

Additionally, under Clause 9(2) of SEPP 19, a public authority must not grant approval to or carry out development on land which adjoins bushland zoned or reserved for public open space unless it has taken into account:

- ‘(c) the need to retain any bushland on the land,
- (d) the effect of the proposed development on bushland zoned or reserved for public open space purposes and, in particular, on the erosion of soils, the siltation of streams and waterways and the spread of weeds and exotic plants within the bushland, and
- (e) any other matters which, in the opinion of the approving or consent authority, are relevant to the protection and preservation of bushland zoned or reserved for public open space purposes’.

An assessment of biodiversity was undertaken as part of the REF and the findings of the investigation are presented in Section 6.7 (GHD, 2014). While some street trees are to be removed, it is proposed to offset the loss by planting new trees in accordance with TfNSW’s *Vegetation Offset Guide* (TfNSW, 2013b)

4.3.3 State Environmental Planning Policy 55 – Remediation of Land

SEPP 55 provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment.

In accordance with Clause 7(1) of SEPP 55, a consent authority must not consent to the carrying out of development on any land unless:

- ‘(a) it has considered whether the land is contaminated.
- (b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or would be suitable, after remediation) for the purpose for which the development is proposed to be carried out.
- (c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land would be remediated before the land is used for that purpose.’

Section 6.8 of this REF contains an assessment of the potential contamination impacts of the Proposal. It is unlikely that any large-scale remediation (Category 1) work would be required as part of the Proposal. The proposed land use does not differ to the existing use and is, therefore, unlikely to be affected by any potential contaminants that exist within the rail corridor.

4.4 Local environmental planning instruments and development controls

The Proposal is located within the Sutherland Shire LGA. The operation of the Infrastructure SEPP means that the Local Environmental Plan (LEP) does not apply. However, during the preparation of this REF, the provisions of the following LEPs were considered:

- *Sutherland Shire Local Environmental Plan 2006* (in force)
- Draft Sutherland Shire Local Environmental Plan 2013

4.4.1 Sutherland Shire Local Environmental Plan 2006

The *Sutherland Shire Local Environmental Plan 2006* (Sutherland Shire LEP) is the governing plan for the Sutherland LGA, including Heathcote. Table 4 summarises the relevant aspects of the Sutherland Shire LEP applicable to the Proposal.

Figure 8 shows the relevant section of the zoning map from the Sutherland Shire LEP 2006, with the indicative location of the Proposal.

Table 4: Relevant provisions of the Sutherland Shire LEP

Provision description	Relevance to the Proposal
Clause 11 – Zoning table and zone objectives	<p>Under the Sutherland Shire LEP:</p> <ul style="list-style-type: none"> • the rail corridor is categorised as Zone 21 Railway • the Princes Highway is Zone 22 Arterial Road • the Royal National Park is Zone 20 National Parks, Nature Reserves and State Conservation Areas • residential land to the east of the railway station is categorised as Zone 3 Environmental Housing (Bushland) and residential land to the west of the Princes Highway is categorised as Zone 3 Environmental Housing (Bushland) and Zone 4 Local Housing • local retail and commercial services located along the Princes Highway are categorised as Zone 9 Local Centre • the schools located along Rosebery Road and Wilson Parade are categorised as Zone 12 Special uses.
Clause 21 – Bushfire	<p>Parts of the Proposal are identified in the ‘Category 1’ or ‘Vegetation Buffer’ zone of the bushfire prone land map. However the upgrade of Heathcote Station is not defined as ‘residential/ rural residential subdivision’ or ‘special fire protection purpose’ and therefore does not trigger the need for an asset protection zone. Nevertheless, the Proposal should include appropriate fire protection measures.</p>
Clause 51 – Ecologically Sustainable Development	<p>TfNSW is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ESD. The ESD principles have been considered through the development and assessment of the Proposal.</p>

Provision description	Relevance to the Proposal
Clause 53 – Transport accessibility, traffic impact and car parking	Development must provide efficient links to identified transport nodes and corridors, such as railway stations. The Proposal is located at Heathcote Station and would provide an accessible link to the station platform from the existing commuter car parks and the Princes Highway (via a link to the new RMS footbridge).
Clause 54 – Heritage	<p>The LEP aims to conserve heritage significance of heritage items in the Sutherland Shire. There are no heritage items within the footprint of the Proposal, however works would be undertaken on Dillwynia Grove for the bus stop upgrade works close to trees on Dillwynia Grove which are listed on the heritage schedule of the Sutherland Shire LEP.</p> <p>It is not anticipated that the Proposal would affect the trees or any heritage items listed on the Sutherland Shire LEP, through the implementation of heritage mitigation measures to be included in the CEMP.</p>

4.4.2 Draft Sutherland Shire Local Environmental Plan 2013

Sutherland Shire Council has prepared the Draft Sutherland Shire Local Environmental Plan 2013 (Draft Sutherland Shire LEP), which once gazetted will supersede the 2006 LEP. Under the Draft Sutherland Shire LEP, rail infrastructure is zoned SP2 Infrastructure - Railway. The Heathcote local centre is zoned B2 Local Centre and is surrounded by low density residential land. On the eastern side of the station the residential land is zoned E4 Environmental Living. There is land directly adjacent to the rail corridor zoned B6 Enterprise Corridor.

Should this LEP be gazetted prior to determination of the Proposal, it is not expected that the Proposal would be inconsistent with the objectives of the new LEP.

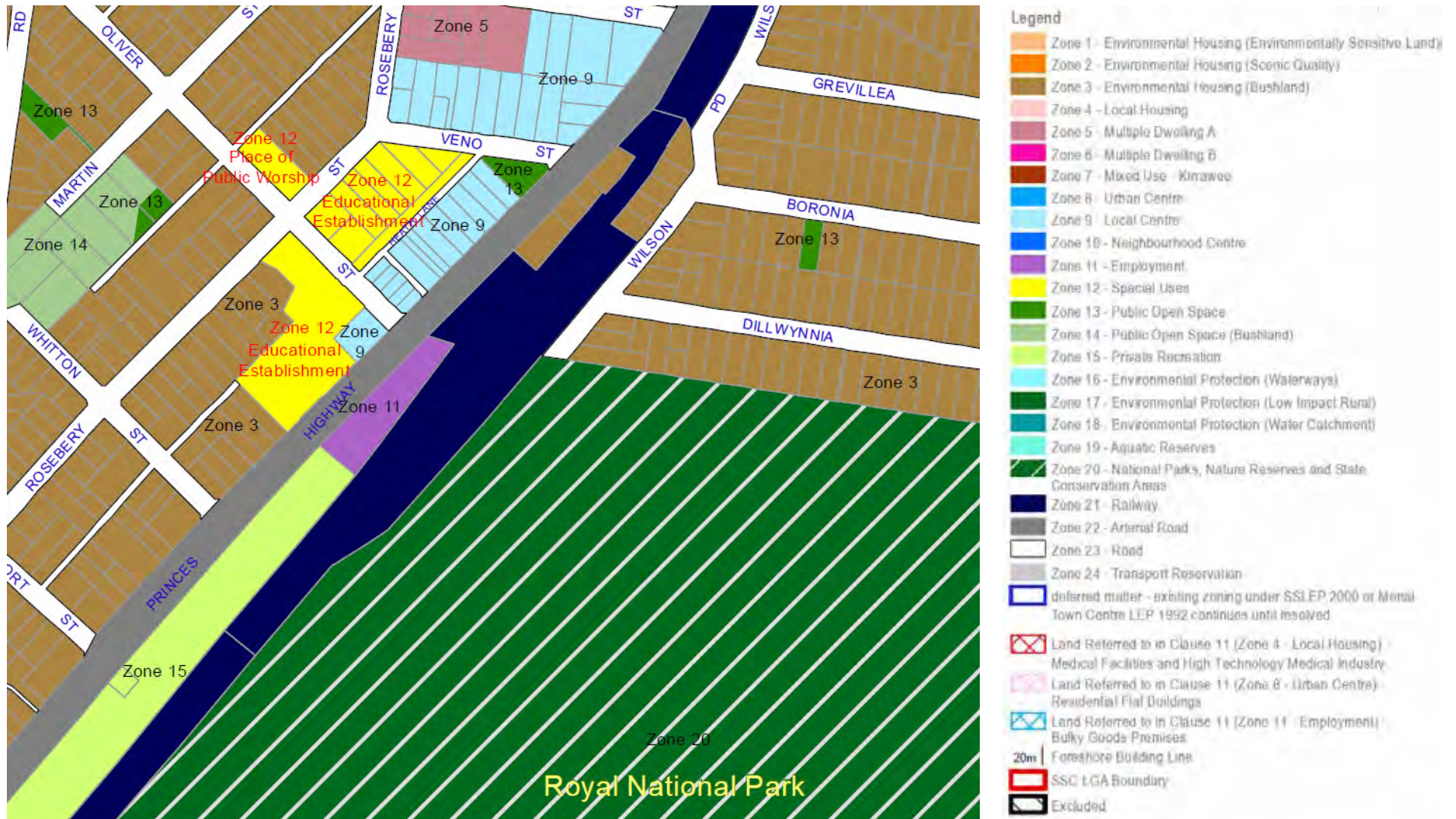


Figure 8: Sutherland Shire LEP 2006 zoning map

Source: Sutherland Shire LEP 2006

4.5 NSW Government policies and strategies

In addition to statutory requirements, several NSW Government policies and strategies are relevant to the Proposal.

In 2007, the NSW Department of Planning released the *Draft Subregional Strategy for the South Sydney Subregion* (Department of Planning, 2007). The Draft Subregional Strategy supported the implementation of the broader *Metropolitan Plan for Sydney 2036* (Department of Planning, 2010), and applied the objectives of the Metropolitan Plan down to a local level.

Under the Draft Subregional Strategy, Heathcote is identified as a neighbourhood centre, containing a cluster of shops and services and between 150-900 dwellings within a 150 metre radius. The Sutherland LGA is forecast to provide an additional 8,000 jobs and 10,100 additional dwellings by 2036. Additional growth and activity would lead to increases in public transport patronage in the region, including at Heathcote Station.

The *Draft Metropolitan Strategy for Sydney 2031* (Department of Planning & Infrastructure, 2013) is currently being finalised along with updated subregional delivery plans. The new delivery plan for the Sydney south region is likely to have revised housing and employment targets, although with similar increasing growth trends over the coming decades.

The proposed Heathcote Station Easy Access Upgrade is consistent with the NSW Government's commitment to deliver an efficient and effective transport system around Sydney and NSW as detailed in *NSW 2021 – A Plan to Make NSW Number One* (Department of Premier & Cabinet, 2011).

NSW 2021 is the NSW Government's ten year plan to guide budget and decision making in NSW. NSW 2021 includes the following goals, targets and priority actions relevant to the Proposal:

- reduce travel times
- minimise public transport waiting times for customers
- improve co-ordination and integration between transport modes
- grow patronage on public transport
- improve public transport reliability
- improve customer experience with transport services.

The NSW Government has developed the *Long Term Transport Master Plan* (TfNSW, 2012a). The plan provides a clear direction for transport over the next 20 years, while building on current commitments. The *Long Term Transport Master Plan* complements and builds on the visions and goals established in *NSW 2021* and this Proposal would support growth and improvements in the safe and efficient management of transport in the Sydney region.

The *Disability Action Plan 2012-17* (TfNSW, 2012c) was developed by TfNSW in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Disability Action Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job, and provides a solid and practical foundation for future progress over the next five years. The Proposal has been developed in consideration of the objectives outlined in this Plan.

4.6 Ecologically sustainable development

TfNSW is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ecologically sustainable development (ESD). The principles of ESD are generally defined under the provisions of clause 7(4) of Schedule 2 to the EP&A Regulation as:

- the precautionary principle – If there are threats of serious or irreversible damage, a lack of full scientific uncertainty should not be used as a reason for postponing measures to prevent environmental degradation
- intergenerational equity – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
- conservation of biological diversity and ecological integrity – the diversity of genes, species, populations and their communities, as well as the ecosystems and habitats they belong to, should be maintained or improved to ensure their survival
- improved valuation, pricing and incentive mechanisms – environmental factors should be included in the valuation of assets and services.

The principles of ESD have been adopted by TfNSW throughout the development and assessment of the Heathcote Station Easy Access Upgrade. Section 3.1.4 summarises how ESD has been and would be incorporated in the design development of the Proposal. Section 6.13 includes an assessment of the Proposal on climate change and sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

Chapter 5 discusses the consultation undertaken to date for the Proposal and the consultation proposed for the future. This chapter discusses the consultation strategy adopted for the Proposal and the results of consultation with the community, relevant government agencies and stakeholders.

5.1 Stakeholder consultation during concept design

As part of the development of concept design options, TfNSW consulted with Sydney Trains, RMS and Sutherland Shire Council. Sydney Trains were involved in the TfNSW workshops to identify key issues and decide on a preferred option. RMS has also been consulted with regards to the new footbridge currently under construction, to understand construction timing and design elements so that the Proposal design can be integrated with the RMS footbridge.

Meetings were also held with Sutherland Shire Council in 2013 and the following issues were raised by the Council for consideration during the development of the preferred option:

- any footbridge should be made wide enough for cyclists to cross
- bicycle and pedestrian links need to be coherent, direct, safe, attractive and comfortable
- access between the eastern and western sides of the station to be retained for general public use and that the existing (or a modified future bridge) is not incorporated into the stations “paid area or a new concourse”
- the bridge forms a vital pedestrian and cycling link between east and west Heathcote and any future upgrade of the station needs to reinforce that function in the design
- lifts should be large enough to accommodate bicycles, prams, luggage, etc
- better lighting in the car park and paths in and around station needs to be installed to improve security
- better weather protection should be provided on the platforms for rail customers.

The preferred option incorporates many of these considerations, including providing a public access across the railway wide enough for bicycled and pedestrians, improved lighting and better weather protection.

5.2 Consultation requirements under the Infrastructure SEPP

Part 2, Division 1 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Clauses 13, 14, 15 and 16 of the Infrastructure SEPP require that public authorities undertake consultation with councils and other agencies, when proposing to carry out development without consent.

Table 5 provides details of consultation requirements under the Infrastructure SEPP.

Table 5: Infrastructure SEPP consultation requirements

Clause 13 Consultation with Councils – development with impacts on council related infrastructure and services	Relevance to the Proposal
<p>Consultation is required where the Proposal would result in:</p> <ul style="list-style-type: none"> • substantial impact on storm water management services • generating traffic that would place a local road system under strain • involve connection to or impact on a council owned sewerage system • involve connection to and substantial use of council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility. 	<p>The Proposal would impact on council owned footpaths and roads through the formalisation of a new footpath along Wilson Parade in addition to minor work to the existing bus stop within Dillwynnia Grove and signage for the new kiss ‘n’ ride on the Princes Highway. Council consultation under this clause is therefore required.</p> <p>Consultation with Sutherland Shire Council has been undertaken as part of the options development and would continue through detailed design and construction.</p>
Clause 14 Consultation with Councils – development with impacts on local heritage	Relevance to the Proposal
<p>Where railway station works:</p> <ul style="list-style-type: none"> • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area. 	<p>The Proposal is not located within a Heritage Conservation Area.</p> <p>The Proposal would not directly impact any known heritage items but works would be undertaken close to trees on Dillwynnia Grove which are locally significant.</p> <p>Consultation with Sutherland Shire Council has regarding proposed works adjacent to the subject trees.</p>
Clause 15 Consultation with Councils – development with impacts on flood liable land	Relevance to the Proposal
<p>Where railway station works:</p> <ul style="list-style-type: none"> • impact on land that is susceptible to flooding – reference would be made to ‘Floodplain Development Manual: the management of flood liable land’. 	<p>The Proposal is not located on land that has been identified as being flood liable land.</p> <p>Consultation with Sutherland Shire Council is not required under this clause.</p>

Clause 16 Consultation with public authorities other than Councils	Relevance to the Proposal
<p>Where development is undertaken adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i>, OEH and other agencies specified by the Infrastructure SEPP where relevant.</p> <p>Although not a specific Infrastructure SEPP requirement, other agencies TfNSW may consult with could include:</p> <ul style="list-style-type: none"> • RMS • Sydney Trains • OEH. 	<p>The Proposal is located adjacent to the Royal National Park (land reserved under the <i>National Parks and Wildlife Act 1974</i>).</p> <p>Consultation with the OEH is required. Consultation with OEH would be undertaken as part of consultation activities for the REF.</p> <p>TfNSW would also continue to consult with RMS with regards to links between the proposed footbridge and RMS footbridge and the proposed kiss 'n' ride zone on Princes Highway.</p>

5.3 Consultation strategy

TfNSW's overall approach to stakeholder engagement is built on a philosophy of 'no surprises'. Ensuring the community and key stakeholders are fully informed and given the opportunity to provide feedback during the planning process is fundamental to the success of a project.

The consultation strategy for the Proposal was developed to encourage stakeholder and community involvement and foster interaction between stakeholders, the community and the project team. The consultation strategy that was developed, having regard to the requirements of the planning process ensures that stakeholders, customers and the community are informed of the Proposal and have the opportunity to provide input.

The objectives of the consultation strategy are to:

- provide accurate and timely information about the Proposal and REF process to relevant stakeholders
- raise awareness of the various components of the Proposal and the specialist environmental investigations
- ensure that the directly impacted community are aware of the REF and consulted where appropriate
- provide opportunities for stakeholders and the community to express their view about the Proposal
- understand and access valuable local knowledge from the community and stakeholders
- record the details and input from community engagement activities
- build positive relations with identified community stakeholders
- ensure a comprehensive and transparent approach.

5.4 Consultation tools and activities

The REF consultation strategy adopts a range of consultation mechanisms, including:

- public display of the REF at various locations
- distribution of a project update up to a radius of approximately 500 metres to the station to local community and rail commuters, where appropriate, outlining the Proposal and inviting feedback on the REF
- advertisement of REF public display in local newspapers with a link to the TfNSW website that includes a summary of the Proposal and information on how to provide feedback
- consultation with Council, RMS, Sydney Trains and other non-community stakeholders.

5.5 Public display

Community consultation activities for the Proposal would be undertaken during the public display of this REF. The display period of the REF would be advertised in the week that the public display commences. The REF would be displayed for a period of two weeks.

The REF would be placed on public display at the following locations:

1. Sutherland Shire Council
2. Sutherland Library
3. Engadine Library
4. Transport for NSW Information Centre, George Street.

The REF would also be available on the TfNSW website: www.transport.nsw.gov.au/projects. Information on the Proposal would be available through the Project Infoline (1800 684 490) or by email (projects@transport.nsw.gov.au).

During this time feedback is invited. Following consideration of feedback received during the public display period, TfNSW would determine whether to proceed with the Proposal and what conditions would be imposed on the project should it be determined to proceed.

5.6 Aboriginal community involvement

An Aboriginal Due Diligence Assessment has been undertaken for the Proposal (refer Section 6.4). The assessment concluded that there are no known Indigenous sites located in the Proposal area; and based on background information, Indigenous site distributions in the region, known levels of disturbance at the site, and absence of an archaeologically sensitive landform; it is considered that the Proposal area has a low potential to contain Indigenous objects or archaeological deposits. Therefore, it was not considered necessary to undertake specific Aboriginal consultation activities.

5.7 Ongoing consultation

At the conclusion of the public display period for this REF, TfNSW would acknowledge receipt of feedback from each respective respondent. The issues raised by the respondents would be considered by TfNSW before determining whether to proceed with the Proposal (refer Figure 1, page 14).

Should TfNSW determine to proceed with the Proposal, the determination report would be made available on the TfNSW website and would summarise the key impacts identified in this REF, demonstrate how TfNSW considered issues raised during the public display period, and include a summary of mitigation measures proposed to minimise the impacts of the Proposal.

Should TfNSW determine to proceed with the Proposal, the project team would keep the community, Council and other key stakeholders informed of the process, identify any further issues as they arise, and develop additional mitigation measures to minimise the impacts of the Proposal. The interaction with the community would be undertaken in accordance with a Community Liaison Plan by the Contractor to be developed prior to the commencement of construction.

6 Environmental impact assessment

Chapter 6 of the REF provides a detailed description of the likely environmental impacts associated with the construction and operation of the Proposal. For each likely impact, the existing environment is characterised and then an assessment is undertaken as to how the Proposal would impact on the existing environment.

This environmental impact assessment has been undertaken in accordance with clause 228 of the EP&A Regulation. A checklist of clause 228 factors and how they have been specifically addressed in this REF is included at Appendix 1.

6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment has been undertaken by GTA Consultants for the Proposal (GTA, 2014). The assessment included desktop analysis and a site inspection. Detailed traffic counts or modelling was not considered necessary as the Proposal is focused on the station area and is unlikely to have major impacts to the surrounding road network. The findings of the assessment are summarised in this section.

6.1.1 Existing environment

Heathcote Station

Heathcote Station is located between Waterfall and Engadine Stations on the Sydney Trains T4 Eastern Suburbs and Illawarra Line and the South Coast Line. It is the 171st busiest station within the Sydney Trains network, with about 1,620 passengers recorded entering and exiting the station during an average weekday in 2011.

Heathcote Station is busier during the morning and afternoon peak periods and reflects its use as both a commuter station to/from Sydney CBD and key employment zones together with non-peak use as a local station.

Road network and traffic

Heathcote Station is accessible via Wilson Parade on the east and the Princes Highway on the western side of the station.

The Princes Highway is a two-way state road (A1) which extends between the Sydney CBD and the Victorian border. It is aligned in a north-south direction adjacent to Heathcote Station. The Princes Highway has a posted speed limit of 60 km/hr through Heathcote. There is left-in/ left-out access for southbound highway traffic to and from the car park immediately west of the station.

Short-stay kerbside parking is permitted along both sides of the Princes Highway in the vicinity of the station, allowing for kiss 'n' ride activity. A northbound clearway restricts parking in the northbound direction on Sundays (October – April) and public holidays.

The signalised intersection of the Princes Highway and Oliver Street accommodates a key pedestrian desire line between the station and the town centre, primary school and residential areas.

RMS is in the latter stages of constructing a footbridge across the Princes Highway, which will provide a safe crossing opportunity immediately north of the Oliver Street traffic signals to improve pedestrian facilities and traffic flow.

Wilson Parade is a key north-south link travelling adjacent to and east of the railway line. It provides the only road crossing of the railway line approximately one kilometre to the

north of the station and links all areas on the eastern side which includes the eastern commuter car park, high school and residential areas. Wilson Parade has a posted speed limit of 50 km/hr.

GTA Consultants completed a sample of traffic movement counts (am/pm on weekday) to understand traffic through the area and Heathcote Station traffic demand. Overall, the station generates up to 100 vehicle movements during a typical morning peak hour. This equates to approximately four percent of the Princes Highway traffic during this period.

Commuter car parking

Two commuter car parks are provided at Heathcote Station; one on the eastern side of the railway line accessed via Wilson Parade and the other on the western side with access via the Princes Highway.

The eastern car park has a supply of around 60 spaces (including two accessible) and the western car park currently provides approximately 60 spaces as a result of the temporary works compound for the RMS footbridge. Typically, it is estimated that the western car park has a supply of approximately 90 spaces, to provide a total formal commuter parking supply of approximately 150 spaces.

During surveys, the eastern car park reached capacity by 8am, with informal parking observed and demand for parking along both sides of Wilson Parade. The western car park had a maximum demand of 55 vehicles (around 90 percent) at 9am. One of the four accessible parking spaces was occupied at the time of the surveys. These results indicate that demand for commuter parking is higher on the eastern side and likely attributed to the general level of accessibility.

Onsite observations also confirmed that there is demand for commuter parking within the surrounding local streets in the vicinity of the town centre west of the Princes Highway and in Wilson Parade. Given the informal nature of commuter parking along Wilson Parade, the nature of parking varies from day-to-day, with both parallel and 90° parking observed.

Taxi and kiss 'n' ride facilities

No formal kiss 'n' ride or taxi facilities are provided in the immediate vicinity of Heathcote Station. Onsite surveys confirmed that the majority of kiss 'n' ride occurs in Oliver Street west of the Princes Highway. Minor activity was also observed on the western side of the Princes Highway and internally in the commuter car parks, particularly in the accessible spaces.

Parking along the southbound side of the Princes Highway is generally underutilised during the weekday AM and PM peaks, offering potential for additional kiss 'n' ride activity close to the station facilities and pedestrian access points.

Bus operations

Several bus stops are provided within a typical walking distance from Heathcote Railway Station, including Wilson Parade and Rosebery Street (west of the station). Transdev operates two services, the 991 and 996, which are feeder services operating between Heathcote and Sutherland and Heathcote and Engadine (loop service), respectively. The closest bus stop to the Proposal is located on Dillwynia Grove and would be upgraded to include new shelter and seating facilities.

Pedestrian access

Direct access to Platform 2 is available from the eastern car park via Wilson Parade. Similarly direct access to the Platform 1 is available from the western car park via the

Princes Highway. A footbridge, located at the northern end of the station and accessed by ramps, facilitates pedestrian movements between the two platforms. The footbridge also connects the variety of land uses on the eastern and western sides of the station and is well utilised across the day by the community.

The key pedestrian desire lines from nearby roads are accommodated by footpaths, including along both sides of the Princes Highway and Oliver Street and along the eastern side of Wilson Parade. However no footpath is provided along the western side of Wilson Parade.

The signalised pedestrian crossing on the northern side of the Princes Highway/Oliver Street intersection accommodates the majority of pedestrians from the west, with a 1-2 metre wide footpath connecting the crossing with the western station access. No dedicated pedestrian facility or crossing facilities are provided on the eastern side of the station, with pedestrians required to walk through the car park to access the station.

GTA Consultants completed pedestrian demand surveys in November 2014 during the weekday AM (6am-9am) and PM (4pm-6pm) peak periods. Peak morning activity demonstrated a 70:30 split between in and out pedestrian traffic. Large groups of school children were noted to be a significant contributor to total pedestrian volumes. It is also worth noting that up to 10 percent of pedestrians were not necessarily accessing the station itself but rather utilising the pedestrian footbridge for exercise/leisure activities.

Cycleways and bicycle access

The Princes Highway is recognised as an on-road cycle route by Sutherland Shire Council, with cycle pavement logos regularly positioned on the kerbside pavement. Onsite observations also confirm that the Heathcote Station footbridge is used by cyclists wishing to traverse the area.

Bicycle facilities include bicycle racks at the western station access with capacity for six bicycles and separate bicycle lockers with capacity for four bicycle located in the north west corner of the western commuter car park. At the time of the site visits, demand for bicycle parking at the racks was moderate, while the lockers were vacant.

6.1.2 Potential impacts

(a) Construction phase

Construction routes

The surrounding road network is well established and would provide direct access to/ from the site. Figure 9 and Figure 10 have been prepared by GTA Consultants to illustrate the likely access routes for each side of the railway line. School zones have been highlighted and it is recommended that, where practicable, construction vehicles avoid passing these locations when active. The Wilson Parade school zone would likely prove difficult to avoid and other mitigation measures, including thorough driver induction and/or traffic control, would be required to ensure safety.

It is anticipated that construction vehicles would also make use of the southbound kerbside lane along the Princes Highway frontage. Given that short-stay parking demand is currently low in this area, this is not expected to have an adverse impact on the surrounding road network. Should an on-street Works Zone be required at any stage, prior approval would be required from RMS Transport Management Centre and/or Sutherland Shire Council. This would likely include the need for a Road Occupancy Licence.

Swept paths of a 12.5 metre large rigid vehicle and 19 metre articulated vehicle to access the Proposal site were developed as part of the assessment and should be further refined as part of a Traffic Control Plan (TCP) for the site to ensure safe entry and exit manoeuvres, with appropriate traffic control.

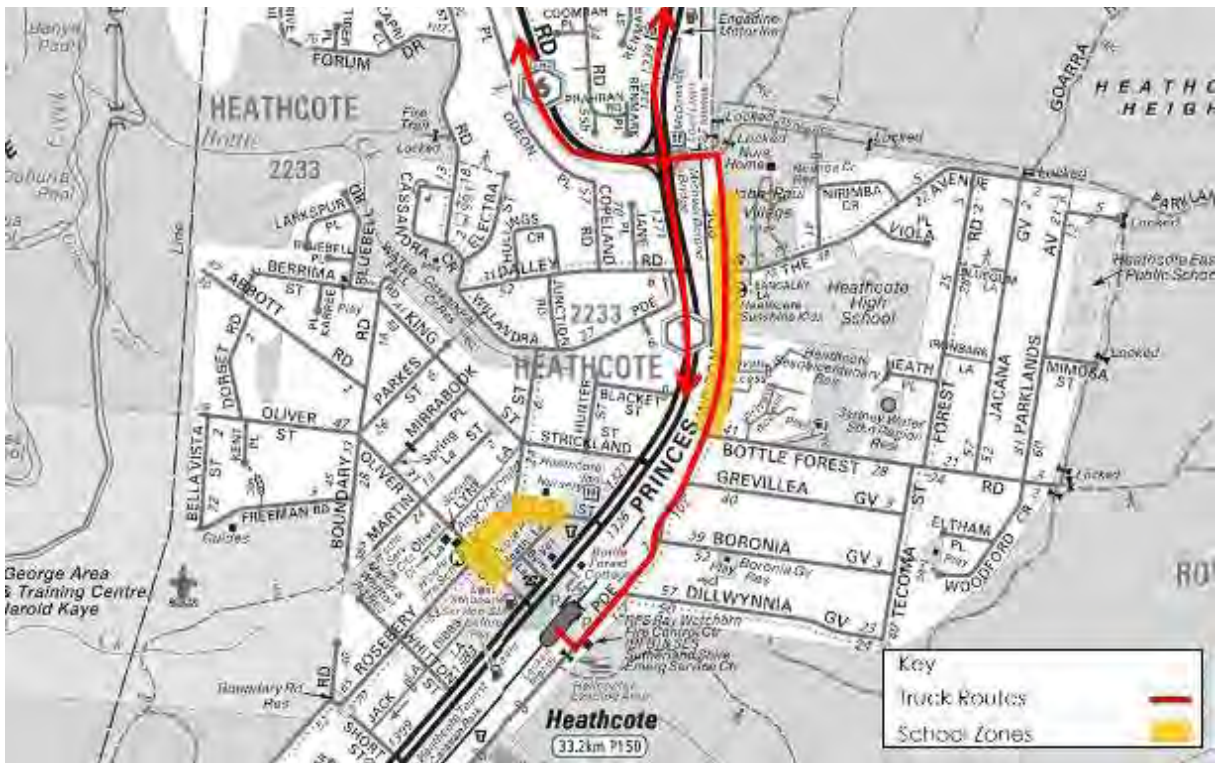


Figure 9: Potential construction vehicle route (eastern side), (GTA, 2014)



Figure 10: Potential construction vehicle route (western side), (GTA, 2014)

Traffic impacts

Traffic generated by the construction would include construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, including conduits, utility poles, and extraction of spoil material. Vehicle types and sizes would vary depending on the required use, but include medium and large rigid vehicles and articulated vehicles for import of bulk materials or spoil removal, as well as concrete trucks. The amount of fill material or spoil would be minor as the site is for the most part level and paved.

The traffic generated by construction at the site is unknown at this stage, however given the nature and size of the proposed works, construction traffic generation is expected to be minor and have a negligible impact on existing traffic conditions. The interaction between the Proposal work site and Princes Highway/Wilson Parade traffic and pedestrians would be managed by qualified personnel to ensure safety for all users at all times.

Negligible impact on access to surrounding properties is expected during construction.

Parking impacts

It is anticipated that construction activities may have a temporary impact on the commuter parking provision, with a degree of parking loss in the eastern and western commuter car parks. In addition, works associated with the footpath upgrade and new entry access on Wilson Parade are likely to have impact on informal car parking demand along Wilson Parade.

It is desirable that works in each of the car parks and on-street be staggered to reduce the impact to both formal and informal commuter parking and a minimum of 120 spaces (including all four accessible spaces) be available in the commuter car parks, where practical.

Given that the demand for parking is generally high in the local area, construction workers would be encouraged to car pool and/ or make use the available public transport for travel to and from the site. A small amount of parking may be possible on-site throughout the works programme however this should be clearly separated from commuter parking areas.

(b) Operational phase

The Proposal has been designed with the key focus on improving accessibility and has taken into account future patronage projections over the next 25 years, which is around a 46 percent increase in rail customers. It is not considered that the Proposal would have significant impacts on bus or rail operations and would likely bring about positive impacts in terms of contributing towards making railway transport more accessible to the community.

Traffic generation and parking demand

Given that the Proposal design provides a higher level of station accessibility and usability at Heathcote Station, the improved commuter experience and upgraded facilities are likely to attract greater use, particularly when combined with the RMS footbridge. As a result, traffic activity is anticipated to marginally increase, with a negligible impact on the surrounding road network.

There is likely to be a net reduction in car parking spaces to allow for the proposed upgrades however efforts would be made during the detailed design of the Proposal to minimise the reduction in parking. Based on the concept design it is estimated that there would be around seven less parking spaces under the new configuration. GTA concluded

that this net loss of parking would not have a major impact and based on the existing utilisation; there remains some onsite parking capacity (approximately 30 spaces) to accommodate the expected minor increase in parking demand.

Car park reconfigurations

Swept path assessment has been completed by GTA Consultants for the proposed Wilson Parade car park entry and the one-way car park operation via the kiss 'n' ride area. The swept path assessment confirms that the proposed layout is suitable to accommodate the largest design vehicle.

The relocation of accessible parking spaces would benefit users, particularly in the western car park, where accessible spaces would be located in close proximity to the lift, stairs and entry forecourt area near the Princes Highway.

Dedicated staff parking sites, currently located where the proposed kiss 'n' ride would be located in the western car park would be relocated in a new area of the car park to be determined during detailed design.

Road safety

The proposed pedestrian footbridge would link to the new RMS footbridge and would encourage pedestrians to use the grade-separated facilities rather than the signalised pedestrian crossing. The proposed kiss 'n' ride facilities on the Princes Highway would further encourage the use of the RMS footbridge. In combination, these proposed facilities would provide a far safer pedestrian environment, significantly reducing the current road safety risk associated with pedestrians interfacing with a highway carrying high traffic volumes.

The proposed pedestrian crossings and footpaths within the eastern car park would highlight the pedestrian desire lines and provide greater awareness to drivers. As a result, the interaction between pedestrians and vehicles would be improved, with a reduced road safety risk.

Kiss 'n' ride facilities

The Proposal includes provision of formalised kiss 'n' ride facilities, including capacity for three vehicles in the eastern car park and seven vehicles in the western car park. The kiss 'n' ride facilities would be located at the station entries in both car parks, where informal kiss 'n' ride activity is occurring under existing arrangements.

Additional formal kiss 'n' ride is proposed on the Princes Highway, immediately north of the overpass. Given that this area would provide pedestrians with a safe and direct connection to the station, it is anticipated that kiss 'n' ride activity at this location would increase, with a corresponding reduction in Oliver Street activity.

The provision for formal kiss 'n' ride facilities on each side of the station and on the Princes Highway would likely result in an increase in associated use. This is anticipated to relate to the change in station facilities and incentive to make use of upgraded, modern station facilities.

Pedestrians

Pedestrian wait times at the Princes Highway pedestrian crossing during peak periods are in the order of 2-3 minutes. Many pedestrians experience frustration with such delays and some become impatient, taking risks to cross against the signals. As such, there are obvious benefits to the proposed pedestrian facilities, particularly in improving the user experience by way of improved safety and efficiency.

Based on the above, the proposed pedestrian improvements would result in coherent, direct and safe connections and the overall user efficiency and connectivity for the station would be enhanced. Pedestrians would also be able to cross the footbridge without having to access 'paid' parts of the station from Platform 2, creating a publicly accessible link from the east side to the west side of the station.

To understand whether there is adequate capacity in the station surrounds to cater for future pedestrian demands while ensuring the safety and convenience for pedestrians, GTA Consultants used Fruin Theory as reproduced in the *Transit Capacity and Quality of Service Manual – 2nd Edition – Part 7* (Fruin, 1987) which involves evaluating the pedestrian capacity and level of service (LOS) of an area.

To assess pedestrian LOS, GTA Consultants chose to use the criteria of 'Pedestrian Flow Rate'. Pedestrian flow rate, measured in pedestrians per metre per minute, is the number of pedestrians that pass a point during a specific period of time. The assessment indicated that based on existing pedestrian volumes, the pedestrian LOS for the Proposal is 'A'. In addition, the widened footpaths would be adequate to accommodate the expected growth in passenger demand. Overall, the new access footpaths would operate well with no queuing or delays expected at any time or location.

Cyclists

TfNSW have considered existing bicycle facilities and likely future demand for cycling across stations and other interchanges in Sydney. For Heathcote Station, the minimum number of bicycle parking spaces required is ten spaces. The proposed bicycle parking provision for the Proposal would be in excess of this requirement, with a total of 20 undercover bicycle rack spaces provided in addition to the relocated bicycle lockers (with capacity for four bicycles). As a result, Heathcote Station would have adequate bicycle parking to cater for the current and future demands.

Given that the majority of the station catchment is within a 10 kilometre radius, a suitable cycling distance, an opportunity exists for the cycling mode share to increase. The relocation of the lockers to the western station access point is likely to increase awareness of such facilities, potentially with an associated increase in the cycling mode share.

Property access

The operation of the car parks is not expected to have any impact on existing access to properties in the vicinity of the site. The new eastern car park entry driveway is not expected to impact operations of the adjacent emergency services centre on Wilson Parade.

6.1.3 Mitigation measures

A Construction Traffic Management Plan (CTMP) would be prepared by the Contractor in consultation with TfNSW, and provided to Sutherland Shire Council and the RMS. The CTMP would be the primary management tool to manage potential traffic impacts associated with construction. The CTMP, at a minimum, would include a description of:

- procedures for preparing and implementing TCPs
- final construction traffic approach and departure routes
- locations of access to and from the local road network and contractor parking
- details of construction signage, traffic controllers (in particular for reversing out of the site) and other community notification
- measures to limit temporary parking losses (e.g. staged construction in car parks)

- measures to maintain customer access to and from the station at all times
- measures to maintain private property access unless otherwise agreed.
- In addition there would be a requirement for a Road Safety Audit to be completed prior to construction commencing and for the Contractor to obtain Road Occupancy Licence/s as required.

Refer to Table 10 for a list of proposed mitigation measures.

6.2 Urban design, landscape and visual amenity

A Visual Impact Assessment was undertaken by Green Bean Design for the Proposal (Green Bean Design, 2014). The findings of this assessment are summarised in this section. The assessment included desktop analysis, site inspection and creation of photomontages to provide an indication of what the Proposal may look like once complete.

6.2.1 Existing environment

The general urban landscape character surrounding Heathcote Station is typical of both residential suburban settings and that of an arterial highway corridor with mixed commercial development. Heathcote is surrounded by national parks including the Royal National Park immediately east of the station.

Residential areas to the east of Heathcote Station extending along Wilson Parade, Dillwynnia Grove and Boronia Avenue, are defined by mostly single storey detached dwellings with front and rear gardens. Dwellings are set back from street frontages with tree planting along nature strips.

By contrast the Princes Highway corridor character is dominated by a busy traffic corridor with street access to adjoining residential areas. A commercial strip located between Oliver Street and Veno Street along the western side of the Princes Highway (opposite the station) provides a mix of services, food outlets and professional health providers.

The existing station is located on a relatively flat gradient and comprises a number of key visual elements:

- north and south bound rail lines, electrical conductors and steel gantries
- two side platforms
- footbridge with ramp access and railings
- station buildings, ticket office and passenger shelters
- commuter car parking east and west of the rail line
- utility poles and wires
- various security and safety fencing
- signage.

The RMS is nearing completion of a new footbridge extending across the Princes Highway. It comprises a 31 metre steel arch footbridge, with steps and lifts either side of the highway.

The station precinct and adjoining road corridors contain a mix of mature native and non-native tree planting which provides a significant degree of screening within proximity to, and beyond the station. Tree planting continues along local residential street nature strips and throughout residential garden areas.

Temporary receivers include pedestrians, train customers and motorists. Permanent receivers include:

- residential receivers to the east on Wilson Parade, Dillwynia Grove and Boronia Grove and to the west on the Princes Highway and surrounding streets
- commercial properties west of the Proposal on the Princes Highway
- Emergency Services Centre east of the Proposal on Wilson Parade.

6.2.2 Potential impacts

(a) Construction phase

While construction activities would tend to be more visible than the operational stage of the Proposal, the construction activities would be temporary and transient in nature. Views toward construction activities would be partially restricted by existing tree cover surrounding the station precinct. New elements typically introduced into the visual environment include:

- temporary fencing and hoardings
- road barriers and signage
- cranes and other construction plant
- scaffolding
- pedestrian fencing
- temporary site office and amenities.

Some construction activities, such as night works would require lighting installation for operational, safety and security purposes. Lighting installations would be placed to avoid light spill to adjoining road corridors and residential areas.

(b) Operational phase

Urban landscape effects

Visual Absorption Capability (VAC) is a classification system used to describe the relative ability of the urban landscape to accept modifications and alterations without the loss of character or deterioration of visual amenity. VAC relates to the physical characteristics of the urban landscape that are often inherent and quite static in the long term. In essence the VAC indicates the ability of an urban landscape setting to 'hide' development.

The VAC of an urban landscape is largely determined by inherent physical factors which include:

- the degree of visual penetration (view distance without obstruction) through surrounding buildings and tree cover
- the complexity of the urban landscape through bulk, scale, form and line.

Urban landscapes with a low visual penetration will have higher visual absorption capability values. Complex urban landscapes which include a mix of scale, form and line (together with some degree of vegetative screening) will also have high visual absorption capability values. The VAC of the urban landscape surrounding the Heathcote Station and the area of proposed works exhibits a relatively high VAC.

Digital photographs were taken during the course of the fieldwork from three different locations to illustrate existing views in the vicinity and combined into a panorama (refer to Figure 11 for photo locations). The panoramic photographs were then annotated to show indicative elements of the Proposal, where relevant. The photomontages for the Proposal are included as Figure 12, Figure 13 and Figure 14.

The Visual Impact Assessment concluded that the Proposal and its associated infrastructure would have an overall low (and predominantly beneficial) impact upon the urban landscape character of the station precinct and surrounding environment. The bulk and scale of constructed elements would be visually contained by existing mature tree planting within and beyond the station precinct. The removal of existing trees in the car parks would result in a minor reduction for screening potential but is unlikely to create any significant additional visual impact.


The Proposal design incorporates various architectural and engineered outcomes that visually minimise bulk and scale of constructed elements through modulation and articulation of structures.

Building form and height of the Proposal, namely the proposed footbridge, also responds to both existing constructed elements within and adjacent to the station precinct including existing station buildings and the RMS footbridge. The Proposal is unlikely to form any significant skyline view from surrounding receiver locations.

The assessment also concluded that the Proposal would result in a seamless integration to the existing station precinct and, as an upgrade to existing transport facilities, retains the station's existing function and purpose in its relation to surrounding land use. The Proposal is considered to result in an overall beneficial visual outcome where contemporary design, modern materials and sympathetic colours to the existing station precinct would combine to create a legible and high visual amenity asset within the surrounding urban landscape.



Legend

 Photomontage location

Photomontage locations



Heathcote Station Easy Access Upgrade

Figure 11: Photomontage locations (GBD, 2014)



Photomontage PM 1 - Existing view south east toward station and the east car park from Wilson Parade footpath (east)



Photomontage PM 1 - Proposed view south east toward station and the east car park from Wilson Parade footpath (east)

Figure 12: View south west towards the station and Wilson Parade car park (PM1), (GBD, 2014)



Photomontage PM 2 - Existing view south east toward station buildings from the station car park (west)



Photomontage PM 2 - Proposed view south east toward station buildings from the station car park (west)

Figure 13: View south east toward station and RMS footbridge from station car park (PM2), (GBD, 2014)



Photomontage PM 3 - Existing view east to south east toward Heathcote Station from Princes Highway footpath (west)



Photomontage PM 3 - Proposed view east to south east toward Heathcote Station from Princes Highway footpath (west)

Figure 14: View east to south east toward station from Princes Highway footpath (PM3), (GBD, 2014)

Viewshed and potential impacts to receivers

For the purposes of the Visual Impact Assessment the viewshed is defined as the area of land surrounding and beyond the Proposal area which could be potentially affected by the Proposal. The viewshed for the Proposal is shown in Figure 15.

The visual significance of the Proposal on surrounding view locations would result primarily from a combination of the potential visibility of the Proposal infrastructure and the characteristics of the landscape between, and surrounding, the view locations and the Proposal. The potential degree of visibility and resultant visual significance is then partly determined by a combination of factors including:

- distance between view location and various elements within the Proposal
- duration of view from receiver locations toward various constructed elements
- predicted impact of the Proposal on existing visual amenity
- nature of predicted visual impacts
- visual sensitivity of locations from which views toward the Proposal exist.

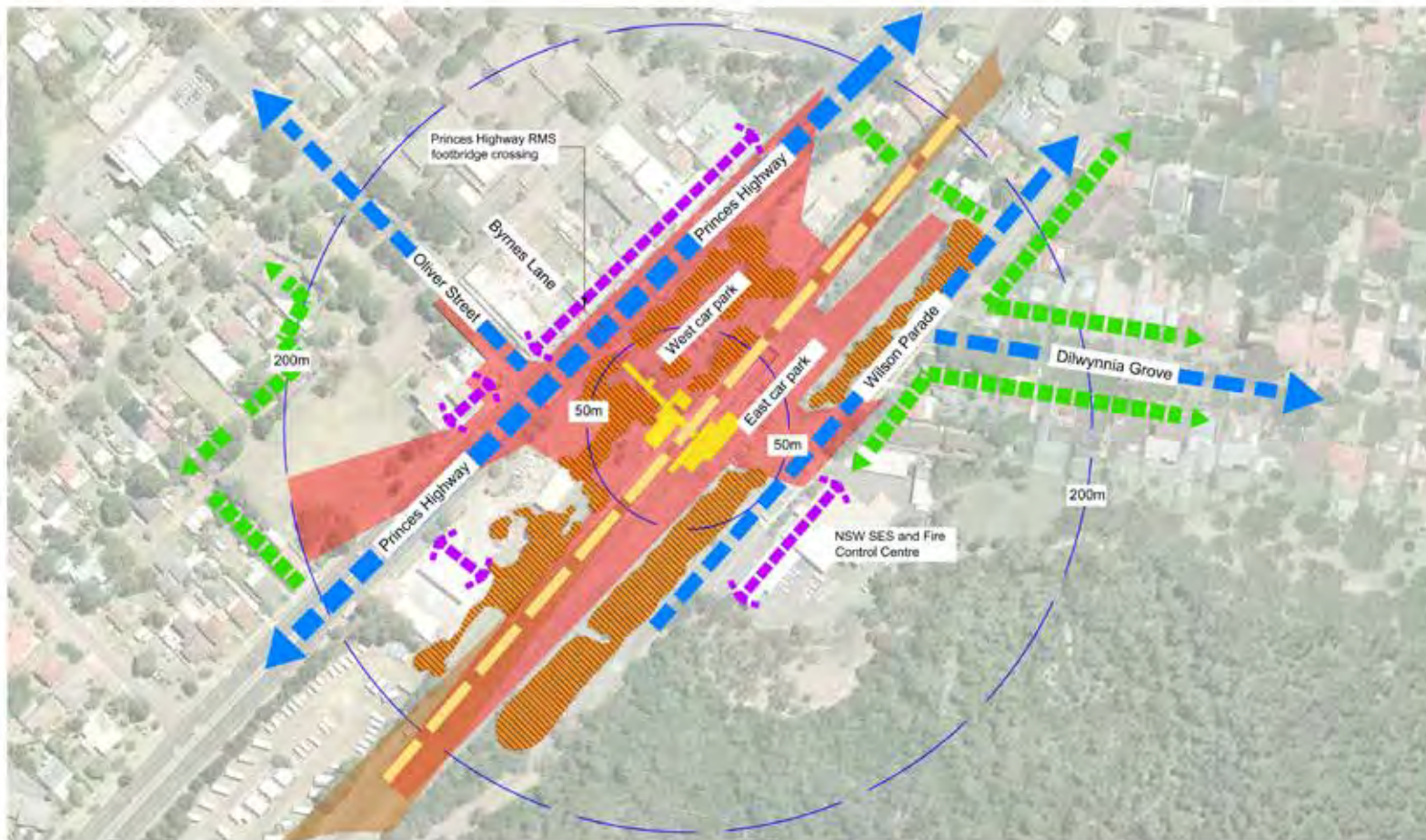
Green Bean Design has undertaken an assessment of the visual impact significance from 12 different receiver locations with regard to above criteria to determine an overall level of significance at each location. The level of visual significance is classified as either high, moderate, low or negligible. The results of the assessment are displayed in the Visual Significance Matrix reproduced at Table 6. The location of the receivers included in the assessment is shown in Figure 16.

The majority of receiver locations, including residential dwellings, road corridors and public spaces beyond the station precinct have been determined to have an overall negligible to low visual significance with regard to the Proposal and its associated infrastructure. The negligible to low visual significance largely results from the screening effect of existing tree planting alongside the Wilson Parade corridor and tree planting within the western station car park which screens and filters views toward the Proposal.

Other impacts

The Proposal would include the installation of lighting, including in the car park for safety and security purposes. Such lighting would be designed and placed in accordance with relevant Australian Standards to minimise obtrusive effects for surrounding receivers.

The location and size of certain elements of the Proposal, such as new station entrance and footbridge would result in shadows but any shadowing would be contained within the station precinct boundary away from road corridors and residential areas.



Legend

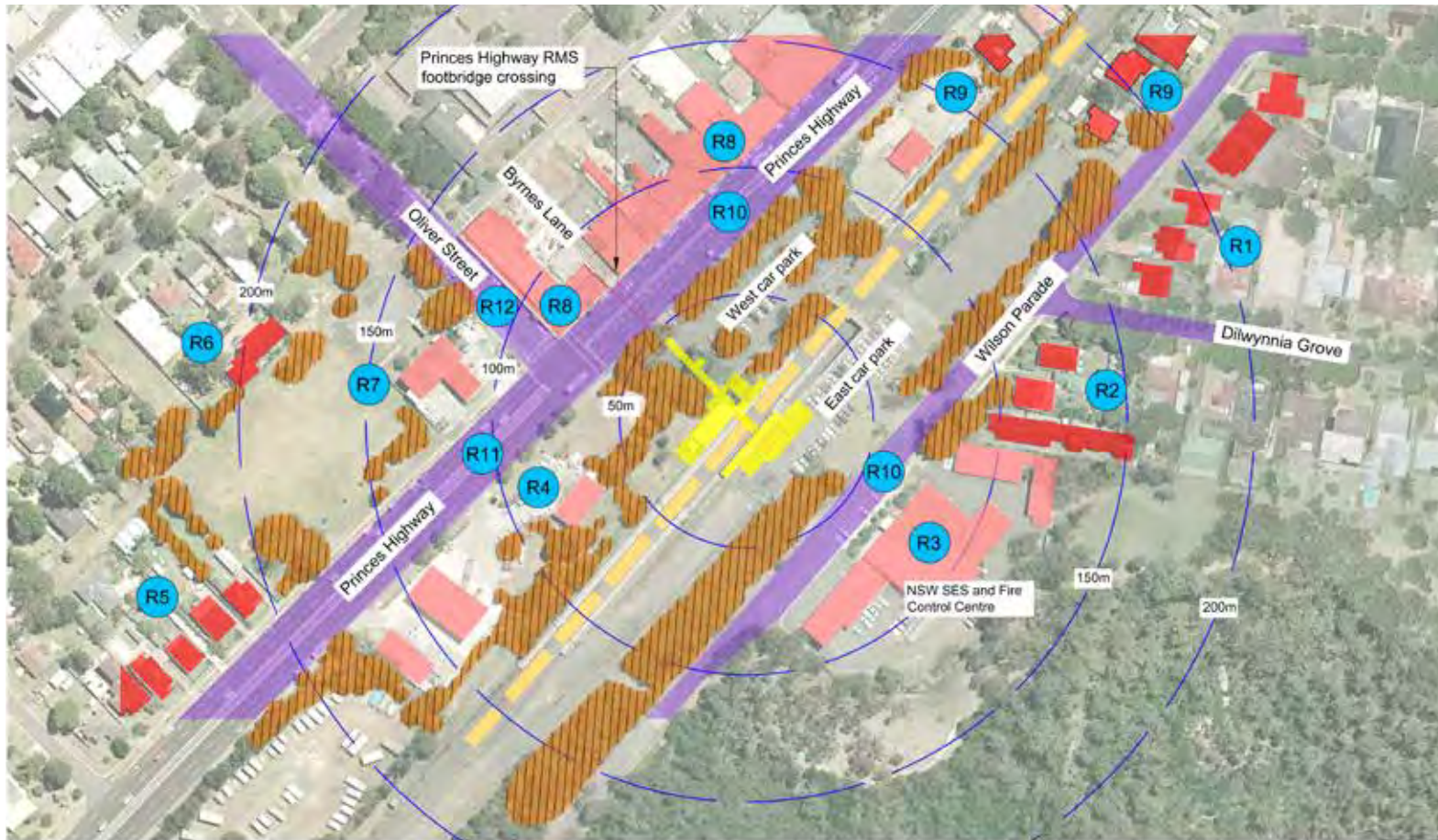
- Heathcote Station footprint
- Rail corridor view
- Building line blocking view beyond
- Primary viewshed
- Road corridor view
- Residential interface
- Tree cover with screening potential


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Heathcote Station Easy Access Upgrade



Figure 15: Proposal viewshed (GBD, 2014)



Legend

- | | | |
|-------------------------------------|----------------------|-------------------------|
| Heathcote Station footprint | Rail corridor | Commercial or workplace |
| Tree cover with screening potential | Residential dwelling | Road corridor |

Receiver locations



Heathcote Station Easy Access Upgrade

Figure 16: Receiver locations for Visual Impact Assessment (GBD, 2014)

Table 6: Visual Significance Matrix (GBD, 2014)

Visual Significance Matrix

Receiver viewpoint	View direction and distance toward Proposal	Description	Distance	Duration	Predicted impact	Nature of impact	Magnitude	Receiver sensitivity	Significance
R1 Residential dwellings	South east – in excess of 100 metres	Views toward the Heathcote Station and the proposed works from residential dwellings bounded by Wilson Parade and Dillwynnia Grove are blocked by dwellings and nature strip tree planting along Dillwynnia Grove as well as tree planting to the west of Wilson Parade.	Long	Long term	Neutral	Irreversible	Negligible	High	Negligible
R2 Residential dwellings	East to south east – between 100 and 150 metres	Views toward the Heathcote Station and the proposed works from residential dwellings south of Dillwynnia Grove and facing Wilson Parade are partially screened and filtered by street tree planting to either side of Wilson Parade. Potential for mostly indirect views toward the proposed station structures.	Long	Long term	Beneficial	Irreversible	Low	High	Low
R3 Emergency Services Centre	East to north east – between 70 and 100 metres	Views toward the Heathcote Station and proposed works from the Emergency Services Centre are partially screened by tree cover alongside Wilson Parade.	Medium	Long term	Beneficial	Irreversible	Low	Low	Negligible

Receiver viewpoint	View direction and distance toward Proposal	Description	Distance	Duration	Predicted impact	Nature of impact	Magnitude	Receiver sensitivity	Significance
R4 Car Workshop	North east - between 50 and 100 metres	Views toward the Heathcote Station and proposed works are partially screened by tree planting adjoining the workshop area and within the station precinct. Views from the workshop are generally orientated toward the highway corridor and away from the station.	Medium	Long term	Neutral	Irreversible	Low	Moderate	Negligible
R5 Residential dwellings	North east - beyond 200 metres	Indirect views toward the Heathcote Station and the proposed works are screened by tree planting along the western side of the station precinct as well as buildings accommodating the service station and car workshop south east of the station buildings.	Long	Long term	Neutral	Irreversible	Negligible	High	Negligible
R6 Residential dwelling	East - around 200 metres	Indirect views toward the Heathcote Station and the proposed works are screened by tree planting along the western side of the station precinct as well as buildings accommodating the service station on the Oliver Street and Princes Highway intersection.	Long	Long term	Neutral	Irreversible	Negligible	High	Negligible
R7 Commercial petrol station	East - between 100 and 150 metres	Views toward the Heathcote Station and proposed works are partially screened by tree planting adjoining and within the station precinct.	Long	Long term	Neutral	Irreversible	Negligible	Moderate	Negligible

Receiver viewpoint	View direction and distance toward Proposal	Description	Distance	Duration	Predicted impact	Nature of impact	Magnitude	Receiver sensitivity	Significance
R8 Commercial and retail	South east to south - between 70 and 150 metres	Views toward the Heathcote Station and proposed works from the Princes Highway commercial strip are partially filtered and screened in places by tree planting alongside the highway corridor and within the station precinct.	Short	Long term	Neutral	Irreversible	Negligible	Moderate	Negligible
R9 Residential dwellings	North east - between 150 and 200 metres	Views toward the Heathcote Station and the proposed works are screened by tree planting adjoining the dwellings as well as further tree cover extending south west alongside the rail corridor.	Long	Long term	Neutral	Irreversible	Negligible	High	Negligible
R10 Wilson Parade	West to south west - between 50 and 100 metres	Views toward the Heathcote Station and proposed works from the Wilson Parade corridor are screened by tree cover to the west and alongside the road corridor. Views would extend toward the Proposal from a section of road (around 40 metres in length) at the existing car park entry.	Short	Short term	Neutral	Irreversible	Low	Low	Low
R11 Princes Highway	North east to east and south to south west - between 50 and 150 metres	Views toward the Heathcote Station and proposed works from the Princes Highway corridor are partially filtered and screened in places by tree planting alongside the highway corridor and within the station precinct.	Medium	Short term	Neutral	Irreversible	Low	Low	Low

Receiver viewpoint	View direction and distance toward Proposal	Description	Distance	Duration	Predicted impact	Nature of impact	Magnitude	Receiver sensitivity	Significance
R12 Oliver Street	East to south east - between 90 and 150 metres	Views from the Oliver Street corridor are partially screened and filtered by tree planting within the western portion of the station precinct and trees adjoining the Princes Highway corridor.	Medium	Short term	Neutral	Irreversible	Low	Low	Low

6.2.3 Mitigation measures

Measures to mitigation visual impacts during construction would be included in a CEMP for the Proposal and would include measures such as minimising light spill during night works, screening of compounds and minimising tree removal. Refer to Table 10 for a list of proposed mitigation measures.

While the overall visual significance of the Proposal has been determined as negligible to low for the majority of surrounding receiver locations, mitigation measures should be considered to minimise the level of residual visual impacts. Detailed design of the Proposal would be undertaken with reference to the recommendations included in the Visual Impact Assessment (GBD, 2014).

The measures contained in the assessment are generally aimed at reducing the extent of visual contrast between the visible portions of the Proposal structures and the surrounding landscape, and/or screening direct views toward the Proposal where possible.

6.3 Noise and vibration

An environmental Noise and Vibration Impact Assessment has been undertaken by SLR Consulting Australia (SLR) for the Proposal (SLR, 2014). The findings of the assessment are summarised in this section.

6.3.1 Existing environment

Sources of noise in the vicinity of the Proposal are typical of a suburban centre affected by road and rail traffic. Existing sources of vibration in the immediate area would most likely be attributable to trains passing through the station. Sensitive receivers within close proximity to the Proposal include:

- residential receivers to the east on Wilson Parade, Dillwynnia Grove and Boronia Grove and to the west on the Princes Highway and surrounding streets
- Heathcote Public School located west of the Proposal on Oliver Street
- Heathcote Anglican Church located west of the Proposal on Rosebery Street
- commercial properties west of the Proposal on the Princes Highway
- Emergency Services Centre east of the Proposal on Wilson Parade.

Two of the nearest receivers were selected as locations to undertake noise monitoring as they were considered representative of the range of potentially highest impacted receivers. Accessibility and potential acoustic influences were also considered when selecting these locations.

SLR conducted operator-attended measurements on 30 October 2014, and continuous unattended noise monitoring for a period of a week in late October 2014 at a residential dwelling (R1) and the Emergency Services Centre (R7) (refer Figure 17). The noise measurements taken at this location were considered representative of the background noise level for neighbouring residential receivers and these levels have been used to inform the construction noise assessment.

As per the procedures outlined in the *Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change, 2009a), background noise monitoring results were used to establish a Rating Background Level (RBL), which is then used for noise assessment purposes (refer Table 7). The existing average noise level (L_{Aeq}) represents the average noise level over the monitoring period. The background noise level

(L_{A90}) represents the noise level exceeded for 90 percent of the monitoring period and is also referred to as the RBL.

An additional five receivers were identified to be included in the noise assessment to make a conservative prediction of potential noise impacts, utilising background monitoring data to set Proposal Specific Noise Criteria (PSNC). Receivers are listed in Table 8 and shown in Figure 17.

Table 7: Summary of existing ambient noise levels (SLR, 2014)

Location	Period	Measurement parameter (dBA)	
		Rating Background Level (L_{A90})	Equivalent Continuous Level (L_{Aeq})
R1	Daytime	54	65
	Evening	48	63
	Night time	33	62
R7	Daytime	43	58
	Evening	42	55
	Night time	32	54

Note: Daytime: 7am to 6pm, Evening 6pm to 10pm and Night time 10pm to 7am

Table 8: Representative noise receivers (SLR, 2014)

Receiver	Address	Description
R1	1373 Princes Highway	Residential, single storey
R2	Corner Princes Highway and Byrnes Lane	Commercial, single storey
R3	Oliver Street	Heathcote Public School
R4	1324 Princes Highway	Residential, single storey
R5	13287-1330 Princes Highway	Commercial, single storey
R6	124 Wilson Parade	Residential, single storey
R7	Wilson Parade	Sutherland Shire Emergency Services Centre



Figure 17: Potential receivers within vicinity of Proposal (SLR, 2014)

6.3.2 Potential impacts

(a) Construction phase

Noise

Proposal Specific Noise Criteria

Proposal specific noise criteria (PSNC) have been developed for receivers as per the procedures in the ICNG. The ICNG prescribes levels for certain receiver types such as commercial and schools and a method for establishing noise management levels for residential receivers (RBL + 10 dBA for standard construction hours; and RBL + 5dBA for out of hours). The 'highly noise affected' levels for residential receivers is 75 dBA. The PSNC for the Proposal are outlined in Table 9. Sleep disturbance noise goals have also been established for residential receivers which are 48 dBA (R1 and R4) and 47 dBA (R6).

Table 9: Proposal Specific Noise Criteria for the Proposal (SLR, 2014)

Receiver	Standard construction hours ($L_{Aeq, 15 \text{ min}}$)	Out of hours ($L_{Aeq, 15 \text{ min}}$)		
		Daytime	Evening	Night time
R1 - residential	64 dBA	59 dBA	53 dBA	38 dBA
R2 - commercial	70 dBA		N/A	
R3 - school	55 dBA (external) 45 dBA (internal)		N/A	
R4 - residential	64 dBA	59 dBA	53 dBA	38 dBA
R5 - commercial	70 dBA		N/A	
R6 - residential	53 dBA	48 dBA	47 dBA	37 dBA
R7 - commercial	70 dBA		N/A	

Noise modelling

Construction of the Proposal would be undertaken over a period of up to 24 months in various stages (refer Chapter 3 for more detail). Modelling of noise sources (trucks, excavators, grinders etc) for each construction activity was undertaken by SLR. The modelling took into account the construction staging of when certain construction plant would be operational and calculated a predicted noise level, based on the known Sound Power Levels for each item of plant.

The noise modelling predicted at which locations there might be exceedances of the PSNC for the different phases of construction under a 'worst case' scenario. During construction, it is unlikely that all machinery would be operational at the same time, but taking a 'worst case' scenario approach helps to identify where noise impacts are likely to be a concern and assists in the formulation of mitigation measures.

Summary of noise impacts during standard hours

From the assessment, it is likely that there would be exceedances of the daytime PSNC at all receivers at various stages of the Proposal for works undertaken during standard construction hours, however noise levels would be less than the ICNG 'highly affected' criteria of 75 dBA.

Construction activities where exceedances of the PSNC are predicted at three or more receiver locations are:

- establishment of the construction compound area
- installation of the new footbridge across rail corridor and connecting to new RMS footbridge
- demolition of the existing footbridge and ramps
- extension of the Wilson Parade car park.
- Residential receivers on Wilson Parade are likely to be most affected with exceedances of around 20 dBA above the PSNC. The modelling also indicates exceedances at Heathcote Public School although the noise assessment notes that the modelling does not account for shielding from nearby buildings. There are a number of buildings on the Princes Highway that would provide noise attenuation and that would reduce noise levels at the school to within the PSNC (SLR, 2014). The worst exceedance (29 dBA) was predicted to occur for receivers along Wilson Parade and Dillwynia Grove for the bus stop upgrade works however such works would comprise only a short period in the context of the overall construction program.
- In relation to construction traffic noise, the construction movements associated with the Proposal are considered to be an insignificant additional contribution to the ambient noise environment.

Summary of noise impacts during out of hours

Out of hours works would be required during possessions that typically extend 24-hours a day over a weekend. Up to around eight possessions would occur during the construction period and the following activities are likely to be required during possessions:

- installation and adjustment of wiring from underneath existing footbridge structure
- installation of new footbridge across rail corridor to new RMS footbridge
- demolition of existing footbridge and ramps.

The modelling has indicated that there would be exceedances of the out of hours PSNC at residential receivers by up to 24 dBA and exceedances of up to 32 dBA of the sleep disturbance criteria for a worst case scenario for the activities listed above. Residential receivers on Wilson Parade are likely to be most affected during out of hours works. However it is important to note that such works would only comprise a number of weekends over the 24-month construction period and most works would be undertaken during standard hours. Any out of hours works would be assessed in more detail and approved by TfNSW along with appropriate community notification and mitigation measures in place, in accordance with TfNSW's *Construction Noise Strategy* (TfNSW, 2012b).

Vibration

When assessing vibration there are two categories of vibration criteria, one related to the impact of vibration on building structures, and one relating to human comfort. The *Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) provides vibration criteria for human comfort. For intermittent vibration (like that which could result from construction machinery) the criteria is based on a concept of a vibration 'dose'. The maximum criteria level is 0.4 m/s^{1.75} for residences during the daytime and 0.26 m/s^{1.75} during the night time.

The German Standard *DIN 4150 1999-02 Standard Structural Vibration – Effects of vibration on structures* provides guidelines for vibration levels for building structures. For dwellings the Standard recommends a maximum allowable vibration velocity of 5 mm/s, and for commercial buildings a maximum allowable vibration velocity of 10 mm/s.

The Noise and Vibration Impact Assessment concluded that the separation distances from the nearest receiver to operation of vibration intensive plant would be sufficient to mitigate potential building impacts including cosmetic damage and would not result in exceedances of human comfort criteria at nearby receivers (SLR, 2014).

(b) Operational phase

Operational activities at Heathcote Station are not proposed to significantly change as a result the existing noise and vibration levels are unlikely to change.

Plant expected to be associated with the operation of the Proposal would include one lift, lighting and electrical equipment including security cameras. Mechanical plant required for operation of the lift would be identified during detailed design and would be selected in order to achieve the acceptable noise levels identified in the *NSW Industrial Noise Policy* (EPA, 2000) and would be free from annoying sound characteristics such as tonality, low frequency, impulsive and intermittent noise.

6.3.3 Mitigation measures

Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Construction Noise Strategy* (TfNSW, 2012b) and the Noise and Vibration Impact Assessment (SLR, 2014).

The CNVMP would be the key management document that would prescribe specific mitigation measures to help reduce the impacts of construction noise and vibration. The measures would focus on contractor inductions, and the efficient operation of plant and equipment, along with prescribing safe working distances for vibration intensive equipment and detailing procedures for noise and vibration monitoring and for obtaining TfNSW approval for out of hours works.

The CNVMP would also be supported by the Community Liaison Plan to be prepared for the Proposal, which would detail community notification requirements which can range from letter box drops, phone calls to offers of alternative accommodation.

Refer to Table 10 for a list of proposed mitigation measures.

6.4 Indigenous heritage

An Aboriginal Heritage Due Diligence Assessment has been prepared by Artefact for the Proposal in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (OEH, 2010).

The assessment included a desktop analysis including review of existing databases, past reports and aerial imagery. A site inspection was undertaken on 22 October 2014 to gain an overall impression of the intactness of the Proposal area and the likelihood of intact areas where Indigenous objects may be located. The findings of the assessment are summarised in this section (Artefact Heritage, 2014).

6.4.1 Existing environment

Historical context

The Heathcote area was thought to have been located within the Dharawal language group area, close to the boundary of neighbouring Darug and Gundungurra language groups meaning that the area may have been part of a 'travel corridor' facilitating movement between different regions. The Dharawal language group was largely coastal and extended from the Shoalhaven River in the south, to Botany Bay in the north and inland to the Georges River.

Study area

The study area comprises an area of around 15,900 square metres and is the area where construction activities for the Proposal are anticipated to occur (refer Figure 7), and includes land on Lot 4 DP 1096009 and portions of land on Wilson Parade and Dillwynnia Grove.

The study area is located within the Sutherland Shire Council LGA in the County of Cumberland, Parish of Heathcote. The study area is located on the boundary of Tharawal Local Aboriginal Land Council and the La Perouse Local Aboriginal Land Council.

Desktop investigation

A search of the Aboriginal Heritage Information System (AHIMS) database was undertaken on 20 October 2014. An area within a one kilometre radius of the study area was searched in order to gain information on the archaeological context of the area, and to ascertain whether there are any previously recorded Indigenous sites within the study area.

A total of 29 sites were identified by the extensive AHIMS search with a majority of site types in the area identified as Art sites. Spatial patterning of sites indicated that most sites are situated outside of the Heathcote developed areas; located within surrounding bushland. Sites tend to be located on slopes in close proximity to waterlines and no sites were located within the study area.

In addition, Sutherland Shire Council has generated online mapping of archaeologically sensitive areas, which demonstrates the areas of the Sutherland Shire where Indigenous heritage objects and places are more likely to be present. The study area mostly falls within the area designated as low archaeological potential. However the portions of the study area, located within the Wilson Parade and Dillwynnia Grove road reserves, are in an area of medium archaeological sensitivity.

Aerial imagery from 1943 was also reviewed and showed that Heathcote Station had already been constructed, although station buildings and platforms had not yet been established. Land on the south east of the railway had been cleared and modified and Wilson Parade and Dillwynnia Grove existed as unsealed roads.

Site inspection

The site inspection confirmed that parts of the study area have been subject to extensive land disturbance activities as described by the Code of Practice. A majority of the area has been disturbed via the development of a train station, construction of roads, pedestrian paths and subsurface utilities.

The due diligence assessment identified that the study area does not contain any landscape features known to have potential to contain Indigenous objects. The study area is located on relatively flat, modified land, with no extant watercourses nearby.

Summary

There are no known Indigenous sites located in the study area; and based on background information, Indigenous site distributions in the region, known levels of disturbance at the site, and absence of an archaeologically sensitive landform; it is considered that the study area has a low potential to contain Indigenous objects or archaeological deposits.

6.4.2 Potential impacts

(a) Construction phase

Construction of the Proposal would involve earthworks and other ground disturbance activities which has the potential to impact Indigenous sites, if present.

A due diligence assessment has been undertaken which has determined that there are no known Indigenous sites or areas where Indigenous objects are likely to occur beneath the ground surface.

The Proposal would impact areas of previously covered land and/or areas where Indigenous objects are unlikely to occur beneath the ground surface. As such, it is not anticipated the construction of the Proposal would have an impact on Indigenous heritage.

(b) Operational phase

There would be no risks to Indigenous heritage from the operation of the Proposal.

6.4.3 Mitigation measures

If unforeseen Indigenous objects are uncovered during development, work should cease and an archaeologist, the OEH, Tharawal Local Aboriginal Land Council and the La Perouse Local Aboriginal Land Council should be informed. If human remains are found, work should cease, the site should be secured and the NSW Police and the OEH should be notified.

If changes are made to the Proposal that may result in impacts to areas not covered by this assessment, further archaeological assessment would be required.

Refer to Table 10 for a list of proposed mitigation measures.

6.5 Non-indigenous heritage

6.5.1 Existing environment

A search of historic heritage registers including the National Heritage List, the Commonwealth Heritage List, the Register of the National Estate (non-statutory archive), the NSW State Heritage Register, the Sutherland Shire LEP 2006 and the Draft Sutherland Shire LEP 2013 have identified that Heathcote Station is not listed as an item of local, State, or national heritage significance. Heathcote Station is also not listed on RailCorp's Section 170 Heritage and Conservation Register.

The Heathcote Railway residences are listed on the Register of the National Estate (non-statutory archive) as Indicative Places and on the heritage schedule of the Sutherland Shire LEP, however these buildings are not located in the immediate vicinity of the station complex and have little relationship to it, as the station is a recent installation (DoE, accessed 12/11/2014). The residences are not located within the Proposal area.

Other locally listed heritage items situated within 100 metres of the Proposal include:

- Dillwynnia Grove cultural street trees, *Lophostemon confertus* (Brush Box)
- “House” – 1 Wilson Parade
- “House” – 122 Wilson Parade
- “Kennet Villa” – 40 Dillwynnia Grove
- Royal National Park.

6.5.2 Potential impacts

(a) Construction phase

There are no listed non-Indigenous heritage items located within the Proposal area and so there would be no direct impacts to known heritage items.

Construction activities, including the operation of vibration-generating equipment have the potential to impact on nearby heritage items, if not appropriately managed. The Noise and Vibration Impact Assessment for the Proposal found that impacts to structures beyond 25 metres were unlikely to be affected by vibration (refer Section 6.3.2). Given the offset distance of nearby heritage items, it is considered that there would not be any impacts to nearby heritage structures.

The stretch of trees along Dillwynnia Grove is listed as locally significant. Tree removal along Dillwynnia Grove is not proposed however there is a low risk of construction activities associated with the bus stop upgrades that could affect trees if activities are not appropriately carried out. No works are proposed within the boundaries of the Royal National Park.

(b) Operational phase

The operation of the Proposal does not present any risks to non-Indigenous heritage.

6.5.3 Mitigation measures

Potential impacts to non-Indigenous heritage would be managed through the implementation of the CEMP prepared by the Contractor that would map and protect nearby non-Indigenous heritage items, including trees along Dillwynnia Grove, and prescribe management measures to ensure these items are not affected.

Any unexpected archaeological deposits would be managed in accordance with relevant legislation and stop-work procedures to be prepared by the Contractor. Further archaeological work and/or consents would be obtained for archaeological deposits prior to works recommencing at the location, where required.

Refer to Table 10 for a list of proposed mitigation measures.

6.6 Socio-economic impacts

6.6.1 Existing environment

Heathcote is a small suburb located on the southern fringe of Sydney, within the Sutherland Shire LGA. It is serviced by both regional and suburban train services and the Princes Highway, linking Sydney and Wollongong and the South Coast. Bus services also extend along Wilson Parade and further west on Rosebery Street (refer Section 6.1 for more detail on existing traffic and transport conditions). RMS is currently constructing a new footbridge over the Princes Highway and which would be integrated with the Proposal design.

The surrounding land use comprises a mix with a variety of receiver types. To the east of the station is the Royal National Park, Sutherland Shire Emergency Services Centre and residential dwellings (refer Figure 3). To the west of the station is the Princes Highway, a strip of commercial shops and businesses and Heathcote Public School. Further west are residential dwellings and the Heathcote Anglican Church on Rosebery Street.

Heathcote Station is the 171st busiest station in the Sydney Trains network with an average weekday patronage of 1,620 trips recorded in 2012 (Bureau of Transport Statistics station barrier counts). Approximately 16 percent of the Heathcote population travel by train to work (Bureau of Transport Statistics, 2013).

6.6.2 Potential impacts

(a) Construction phase

The construction of the Proposal has the potential to temporarily impact customers, pedestrians, motorists, residents and other receivers as a result of:

- changes to access arrangements including traffic and pedestrian diversions along Wilson Road and Dillwynnia Grove and in station car parks
- temporary loss of parking in station car parks
- changes to accessing station entry points and platforms
- disruptions to station facilities and amenities
- increased in truck movements delivering site materials
- construction noise, dust and visual impacts.

As discussed in Section 6.1, access for and to emergency services, including the adjacent Emergency Services Centre would be maintained at all times. It is not anticipated that access to private property would be affected during construction of the Proposal as works are to occur on Sydney Trains land or on adjacent council-managed roads, away from private property and driveways.

(b) Operational phase

The Proposal would provide positive socio-economic benefits to Heathcote and the Sutherland Shire, including:

- improved accessibility for customers in to Heathcote Station - including the provision of an accessible route for the mobility impaired to both station platforms through provision of accessible parking, lift and footbridge
- a connecting link from the new station footbridge with the RMS footbridge to provide public access to both sides of the station and across the Princes Highway
- improving connections with wider pedestrian network with new pedestrian access along Wilson Parade to the station, and from the Princes Highway through the western car park to the station
- improved and safer traffic flow through the eastern car park through the addition of a new entry access, pedestrian crossings and additional lighting
- improved transport interchange facilities including new kiss 'n' ride zones and bicycle facilities
- improved customer amenity and facilities at the station, including a family accessible toilet and canopies for weather protection
- potential increased use of public transport to and from Heathcote.

No property acquisition would be required as a result of the Proposal.

6.6.3 Mitigation measures

Refer to Sections 6.1, 6.2 and 6.3 for discussion on the potential traffic, transport, visual and noise impacts arising from construction of the Proposal and the proposed management strategies.

Table 10 provides a number of environmental safeguards to minimise these potential impacts with a particular focus on keeping the community informed and includes the following:

- sustainability criteria for the Proposal would be established to encourage site personnel to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal
- the Community Liaison Plan would identify all potential stakeholders and the best practice methods for consultation with these groups during construction. The Plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible
- the community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan (to be developed by the Contractor prior to construction)
- contact details for a 24-hour construction response line, project infoline and email address would be provided for ongoing stakeholder contact throughout the construction phase.

6.7 Biodiversity

A Flora and Fauna Impact Assessment has been prepared by GHD for the Proposal which included a desktop assessment, literature review and site inspection of the Proposal area which was undertaken by two ecologists on 23 October 2014. The findings of the assessment are summarised in this section.

6.7.1 Existing environment

The results of the database searches indicate the following threatened biota previously recorded or predicted to occur in the locality of the Proposal:

- 39 threatened ecological communities listed under the TSC Act and/or EPBC Act
- 30 threatened flora species listed under the TSC Act and/or EPBC Act
- 54 threatened fauna species listed under the TSC Act, FM Act and/or EPBC Act
- six migratory species listed under the EPBC Act.

No threatened flora, fauna or migratory species were identified during the survey. The Proposal site does not contain any intact vegetation communities; or threatened or endangered ecological communities. There is very limited potential habitat for threatened species, given the lack of intact vegetation and the highly modified nature of the area. It is also considered very unlikely that threatened fauna use the Proposal area for nesting or roosting purposes, given the presence of only one hollow-bearing tree with a very small hollow, and the ongoing disturbance from noise and light associated with the existing station precinct.

It is important to note that the Proposal is in close proximity to extensive tracts of native vegetation with the Royal National Park, and that the majority of threatened species records for the locality are associated with the national park, rather than the urbanised and developed areas of the township of Heathcote. The Flora and Fauna Impact

Assessment confirmed that the Royal National Park would not be impacted by the Proposal given the nature of the proposed activities and separation distance (GHD, 2014).

With regards to existing vegetation, a shelter belt of vegetation adjacent to Wilson Parade is present on the eastern side of the station. This belt appears to have been planted, although some native (as well as exotic) species have self-recruited. On the western side of the subject site, vegetation is present around car park areas and along pedestrian footpaths.

Eighteen trees were identified within the subject site during the survey. This includes four Bangalay, three Tallowwood, three Blue Gum hybrids, two Blackbutt and one stag, a Narrow-leaved Ironbark (*Eucalyptus crebra*), a Brush Daphne, a Black Wattle, a Black She-oak and a Forest Red Gum (*Eucalyptus tereticornis*). Refer to Figure 18 for the approximate location of these trees.

The majority of trees were in moderate to good health with only one dead tree recorded (Tree 1). The canopy height of trees generally reached around 20 metres, with two trees extending to a height of 22 metres (Tree 9 and 15). The age class of the trees observed within the Proposal site ranged from early mature to mature. Three trees in the Proposal area are compromised as a result of the pavement being located within their structural root zone (SRZ) (Tree 9, 10 and 11).

Trees 9-14 have restricted canopies and root areas, as a result of their location. The garden bed in which they are growing is narrow with compacted soil. The canopy extends towards the existing access ramp and occasional pruning operations are evident. There are dead branches in all six trees, which may occasionally fall. Tree 14 was also identified as a hollow bearing tree and an Eastern-striped Skink was observed basking outside a small longitudinal hollow during the survey.

Access to Trees 15 to 17 was restricted because of ongoing work in this area associated with the RMS footbridge. Of these three Tallowwoods, Tree 17 is the least vigorous.

Distinctive scats or pellets were not recorded within the Proposal site and it is unlikely that arboreal mammals would use the identified trees for either foraging or nesting.

Three noxious weeds (Lantana, Small-leaved Privet and St John's Wort) were identified in the shelter belt to the west of the station. Lantana is listed as a Weed of National Significance.



Figure 18: Approximate location of trees in Proposal area (GHD, 2014)

6.7.2 Potential impacts

(a) Construction phase

As noted in Section 6.7.1, no threatened flora species or ecological communities were observed within the Proposal area, along with a very limited potential for threatened fauna to be present due to the absence of suitable habitat. As such the Proposal would not be likely to have a significant impact on any threatened species, population or ecological community or their habitats listed under the TSC Act. The Proposal would also be unlikely to have a significant impact on any threatened biota listed under the EPBC Act.

Potential biodiversity impacts associated with the construction of the Proposal are instead associated with direct and indirect impacts to native flora and fauna.

Direct impacts

Several native planted *Babingtonia virgata*, Tick Bush, Golden Wattle and Sweet Pittosporum within the weedy shelterbelt located east of the station would be removed for the proposed car park extension works. Proportionally, more exotic species (like the Small-leaved Privet and Lantana) would be removed given the level of weed infestation in this area. A dead tree (Tree 1) in close proximity to the proposed kerb alignment could be removed if required.

Trees 3, 4 and 5 that lie adjacent to Wilson Parade, may also require removal if it appears that more than 10 percent of their Tree Protection Zone (TPZ) would be affected by the proposed works.

On the western side of the station there is a row of planted eucalypts comprising a mix of six Bangalay and Sydney Blue Gum hybrids that would need to be removed (Trees 9-14). Tree 17 (Tallowwood adjacent to the Princes Highway) would also require removal, with adjacent trees to be removed only if required and should be retained if possible (Tree 15 and 16). However trees 15 and 16 may lose proportions of their Structural Root Zones (SRZ) during the ongoing works.

The removal of planted trees would have a negligible impact on common fauna species in the subject site. Common birds may experience a loss of minor perching and limited foraging habitat within the subject site. The mortality of some garden skinks may also occur from the removal of these trees.

Indirect impacts

The Proposal has the potential to increase the introduction and spread of exotic plants and pathogens through increased visitation, fragmentation of vegetation and disturbance of soil. Increased weed invasion can lead to decreased diversity of native flora, compromised structural integrity of native vegetation communities and a decrease in habitat quality for native fauna. Weed invasion is present on the eastern side of the Proposal site in the shelterbelt. Weed invasion in the western side of the Proposal site is currently being controlled through the presence of mulch in the garden beds.

Environments downslope of the Proposal area (such as a drainage line in bushland to the south west and perpendicular to Wilson Parade) could potentially be impacted if there is erosion of exposed soil surfaces during construction. Sediment-laden runoff could affect water quality and aquatic ecosystems through the smothering of macro invertebrate organisms in the waterway, filling gaps of riffle habitat and reducing water clarity and therefore photosynthetic efficiency of water plants. However such risks can be managed by the implementation of effective erosion and sedimentation controls.

The Proposal site is currently exposed to regular noise disturbance from trains and road traffic (particularly along the Princes Highway). The Proposal would temporarily increase noise and vibration through the construction and demolition of buildings with plant, machinery and earth moving operations. However impacts from noise and vibration are not expected to affect native fauna.

(b) Operational phase

Operational activities at Heathcote Station are not proposed to significantly change as a result there would be no increased risk to biodiversity.

6.7.3 Mitigation measures

TfNSW has prepared a *Vegetation Offset Guide* (TfNSW, 2013b) to provide a framework for a consistent approach to offset impacts to vegetation on applicable TfNSW projects and allows for appropriate offsets to be applied for one tree or a group of trees that do not form part of a vegetation community, regardless of whether they are native or not.

As seven trees have been identified for removal (one large, five medium and one small), the Flora and Fauna Impact Assessment has recommended that a minimum of 30 trees be planted to meet TfNSW's offset ratios. Any additional trees that are found to require removal during construction would also need to be offset. Such measures and procedures for tree assessment and removal would be included and implemented as part of the CEMP for the Proposal. This would also include the presence of an ecologist onsite to check for active nests, prior to the removal of hollow bearing trees (i.e. Tree 14).

The CEMP would be developed in accordance with the recommendations of the Flora and Fauna Impact Assessment (GHD, 2014) and would include a range of other weed control, tree protection, and erosion and sedimentation control measures. Refer to Table 10 for a list of proposed mitigation measures.

6.8 Contamination, landform, geology and soils

A geotechnical investigation was undertaken as part of the development of the concept design (AECOM, 2013) and was carried out in accordance with AS 1726-1993 Geotechnical Site Investigations. In addition a Phase 1 contamination investigation was undertaken by Greencap in accordance with the *Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011) and involved a desktop analysis and site inspection (Greencap, 2014). The findings of these investigations are summarised in this section.

6.8.1 Existing environment

Geology and soils

Heathcote Station has been constructed at grade, so works associated with the Proposal would be undertaken on land with a relatively flat gradient. The surrounding landscape slopes roughly to the east.

A review of the Wollongong - Port Hacking 1:100,000 Geological Series Sheet (Shroud, Sherwin, Roy and Baker, 1985) indicates that the Proposal is located within the boundaries of the Hawkesbury Sandstone landscape which is typically characterised by medium to coarse-grained quartz sandstone, very minor shale and laminate lenses.

The soil landscape type at the Proposal site has been identified as the Faulconbridge soil landscape from the Soil Landscape of Wollongong Port Hacking 1:100,000 Sheet Report (Hazleton and Tille, 1990). The Faulconbridge soil landscape consists of level to gently undulating crests and ridges on plateau surfaces of Hawkesbury Sandstone.

Mapping did not indicate the presence or elevated risk of acid sulfate soils.

Geotechnical investigations were undertaken by AECOM on 14 September 2013 and involved drilling of one borehole at the location of the footbridge pile on the eastern side. Drilling was undertaken to a depth of approximately 12 metres and the following is a summary of the subsurface profile encountered in the borehole:

- fill materials to a depth of 0.4 metres
- residual soils (sandy clay and clayey sands of low to medium plasticity) between depths of 0.5 and 1.75 metres
- Hawkesbury Sandstone bedrock between 1.1 and 2.0 metres
- weathered-fresh bedrock up to a depth of 10 metres.

Contamination

Greencap as part of the Phase 1 contamination investigation undertook a review of historical photos and land titles, planning certificates, contaminated land register, groundwater bore database and existing soil and geological mapping. A site inspection of the Proposal was undertaken on 13 November 2014.

Based on this review it was not considered that there was a need to notify the EPA of contamination as per the requirements of the *Guidelines on the Duty to Report Contamination* under the *Contaminated Land Management Act 1997* (Department of Environment and Climate Change, 2009b). However the assessment noted that the site has been used as part of a railway network for over a century and a number of potential contamination sources were noted which included filling material on the station platforms, hazardous building materials onsite and treatment of rail ballast for vermin and weed protection.

As a result of this land use, a number of contaminants of potential concern may be present such as asbestos, heavy metals, organochlorine pesticides, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, polychlorinated biphenyls and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX). The assessment confirmed that asbestos, lead (paint), polychlorinated biphenyls and ozone depleting substances were present onsite.

There may be contaminated fill present onsite, in particular beneath the hardstand of the platform and within the footprint of the former rail siding on the eastern side. The report recommended that further investigations be undertaken if materials in this area are at risk or being exposed or disturbed during construction (Greencap, 2014).

There is also the potential for contamination of soil as a result of offsite impacts; for example spills and leaks from the two service stations and car servicing station located to the south west of the Proposal site on the Princes Highway.

6.8.2 Potential impacts

(a) Construction phase

The Proposal would require some excavation work for the installation of footings for the lifts, footbridge structures, car park extension and new footpaths. Other trenching or excavation may be required for the relocation of services or tree removal.

Excavation and other earthworks such as trenching can result in erosion and sedimentation if not undertaken with appropriate controls. Such impacts can also lead to an adverse effect on biodiversity such as through the introduction of sediments into waterways. Erosion and sedimentation risks for the Proposal are considered to be low,

given the level slope of the area and that it is expected that erosion could be adequately managed through the implementation of standard measures as outlined in the *'Blue Book' Managing Urban Stormwater, Soils and Construction* (Landcom, 2004).

In addition, given the past land use and findings of the geotechnical investigation, excavation has the potential to expose contaminants, which if not appropriately managed, can present a health risk to construction workers and the community. Contaminants would also pose an environmental risk if they were to enter nearby waterways through the stormwater infrastructure. As there is potential for onsite contamination, chemical testing and visual characterisation would be undertaken to confirm the composition and nature of excavated material. Where spoil is classified as unsuitable for reuse it would be transferred to an appropriately licensed offsite facility.

During construction works, there is also the potential for soil to become contaminated through incidental chemical or fuel spills and leaks from construction plant and equipment.

(b) Operational phase

There would be operational risks to geology and soils as a result of the Proposal.

6.8.3 Mitigation measures

As part of the CEMP, a site-specific erosion and sediment controls plan/s would be prepared and implemented in accordance with the *'Blue Book' - Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004). The Erosion and Sediment Control Plans would be established prior to the commencement of construction and be updated and managed throughout as relevant to the activities during the construction phase.

Further investigations of potential contamination would be undertaken if areas identified in the contamination report (platform hardstand and rail siding) are at risk of being exposed or disturbed during construction. Measures to mitigate potential impacts from any contaminated soil/materials during construction would be developed and implemented through a Waste Management Plan as part of the CEMP. All waste would be managed in accordance with relevant legislation.

Refer to Table 10 for a list of proposed mitigation measures.

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface water and groundwater

The nearest surface waterway is Heathcote Brook located approximately 200 metres east of the Proposal site which flows in an easterly direction. Based upon the topography it is considered that run off from the Proposal site would drain toward this waterway (Greencap, 2014).

Surface runoff within the vicinity of the Proposal is managed by Sutherland Shire Council's stormwater drainage system that consists mainly of at-grade stormwater pits, connected to an underground pipe network.

No groundwater was detected during geotechnical investigations (AECOM, 2013).

Flooding

In 2004, Bewsher Consulting Pty Ltd undertook an Initial Subjective Assessment of Major Flooding study for Sutherland Shire Council (Bewsher, 2004). The study analysed the likely areas affected by a 100 year Average Recurrence Interval (ARI) flood event and an extreme flood event. The results of the study indicated flooding does not occur in the vicinity of Heathcote Station, however flooding does occur north of the station along Willandra Parade at Bottle Creek. The extent of the flood event north of the station is located a significant distance away from the station and should not pose any impact for surface flooding.

6.9.2 Potential impacts

(a) Construction phase

Without appropriate safeguards, pollutants (fuel, chemicals or wastewater from accidental spills, and sediment from excavations and stockpiles) could potentially reach nearby stormwater drains and flow into nearby waterways, including waterways in the Royal National Park.

Activities which would disturb soil during construction work have the potential to impact upon local water quality (which includes waterways in the Royal National Park) as a result of erosion and run off sedimentation.

Groundwater was not encountered during geotechnical investigations however areas of excavation may need to be dewatered as a result of rainfall runoff. Incorrect dewatering can pose risks to nearby waterways.

(b) Operational phase

The Proposal is unlikely to impact upon the hydrology of the Proposal site or the surrounding area. The detailed design would take stormwater management into consideration and while the new design does result in an increase in impervious areas through the extension of the eastern car park, the Proposal would be designed in accordance with the relevant Sydney Trains, Sydney Water and Council standards and requirements.

6.9.3 Mitigation measures

As noted in Section 6.8.3, Erosion and Sediment Control Plans would be prepared and implemented for the Proposal to manage risks to water quality. Other mitigation measures that would be required for construction include regular vehicle and equipment maintenance along with spill kits and spill response procedures. Any dewatering would be undertaken in accordance with the TfNSW's *Water Discharge and Reuse Guideline* (TfNSW, 2013c).

Operational risks associated with localised flooding from an increase to impervious areas through the extension of the eastern car park would be addressed during detailed design of the Proposal.

Refer to Table 10 for a list of proposed mitigation measures.

6.10 Air quality

6.10.1 Existing environment

Based on a review of the existing land uses surrounding the Proposal, the existing air quality is considered to be characteristic of an urban environment and would be susceptible to air quality impacts from bushfires given the presence of nearby bushland. Sensitive receivers in the vicinity of the Proposal include:

- staff and customers at Heathcote Station
- residential properties to the east and west of the station
- commercial properties to the west of the station
- Heathcote Public School
- recreational users of the Royal National Park.

The OEH undertakes air quality monitoring for five key air pollutants: ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), sulphur dioxide (SO₂) and particulates less than 10 micrometres in diameter (PM₁₀), as well as providing an hourly and daily regional air quality index.

Sutherland Shire forms part of the Sydney East monitoring region with air quality monitored from five fixed sites at Chullora, Rozelle, Lindfield, Randwick and Earlwood. The Illawarra region measures air quality at Albion Park, Kembla Grange and Wollongong.

The *NSW Air NEPM Compliance Report 2013* (OEH, 2014) reported on exceedances of pollutants against National Environment Protection Measures (NEPM) goals. There were no exceedances in the Sydney East and Illawarra regions for nitrogen dioxide, sulphur dioxide or carbon monoxide. Ozone levels were above the NEPM goal level in the Illawarra on at least three days and PM₁₀ levels were exceeded at the Wollongong station on six days.

A search of the daily regional air quality index for the Sydney East region for the last year (November 2013 to November 2014) showed that the region experienced:

- very good air quality on 10.7 percent of days
- good air quality on 74.5 percent of days
- fair air quality on 11.0 percent of days
- poor air quality on 2.7 percent of days
- very poor air quality on 0.3 percent of days
- hazardous air quality on 0.8 percent of days.

6.10.2 Potential impacts

(a) Construction phase

The main air quality impacts that have the potential to occur during construction would be temporary impacts associated with dust particles. Anticipated sources of dust and dust-generating activities include:

- excavation of the footings and lift pit for the new access to the station platform
- dust generated from the loading and transfer of material from trucks
- general construction works

- emissions of CO, SO₂, PM₁₀, nitrous oxides, volatile organic compounds (VOC), and polycyclic aromatic hydrocarbons (PAH) compounds associated with the combustion of diesel fuel and petrol from construction plant and equipment.

The Proposal would have minimal impact on air quality as it would not involve extensive excavation or other land disturbance with the potential to generate significant quantities of dust. Small amounts of dust may be produced by the minor excavation associated with the proposed lift shaft and unpaid concourse footings, and project plant/vehicle movements.

The operation of plant, machinery and trucks may also lead to increases in exhaust emissions in the local area, however these impacts would be minor and short term.

(b) Operational phase

Overall impacts of air quality during the operation of the Proposal are considered minimal as the Proposal would not result in a significant change in land use. Also, as the Proposal would increase access to public transport, the use of public transport would be anticipated to increase and subsequently aim to reduce the amount of private vehicle related emissions in the long term.

6.10.3 Mitigation measures

Table 10 provides a list of mitigation measures that are proposed to manage air quality issues during construction. They are aimed around maintaining and operating plant and equipment efficiently and implementing measures for dust suppression including watering, covered loads and appropriate management of tracked dirt/mud on vehicles. Such measures would be included in the CEMP to be prepared for the Proposal.

6.11 Other impacts

6.11.1 Services/utilities

The Proposal has the potential to impact services such as through direct impact from excavation activities or operation of other equipment, if services are not appropriately identified and protected or relocated. The Proposal is located close to several underground services as identified in Section 3.2.8. In addition cabling from underneath the existing footbridge would need to be relocated along with above ground high voltage electrical cables in the eastern car park. The detailed design of the Proposal would be undertaken to avoid services where feasible. Relocation or other works that may affect services would be undertaken in consultation with the utility.

6.11.2 Bushfire prone land

Parts of the Proposal are identified in the 'Category 1' or 'Vegetation Buffer' zone of Sutherland Shire Council's bushfire prone land map. While the upgrade of Heathcote Station does not trigger the need for an asset protection zone the Proposal would be designed with appropriate fire protection measures.

6.11.3 Waste

The construction of the Proposal would generate the following waste:

- asphalt and concrete
- earthworks spoil
- various building material wastes (including metals, timbers, plastics, concrete, carpeting etc)

- general waste, including food and other wastes generated by construction workers.

Waste management would be undertaken in accordance with the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act). A Waste Management Plan would be prepared that would identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities along with other onsite management practices such as keeping areas free of rubbish.

6.12 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in close proximity to one another. The impacts may be caused by both construction and operational activities and can result in a greater impact to the surrounding area than would be expected if each project was undertaken in isolation.

The RMS footbridge across the Princes Highway is currently under construction and is due for completion at the end of 2014. While there would be no overlap of construction activities, nearby sensitive receivers may experience 'construction fatigue' from another construction project being constructed within a relatively close time frame, in particular with regards to noise, air quality and traffic impacts. The Community Liaison Plan would be a key tool to identify appropriate communication for sensitive receivers to keep them informed of major milestones and particular impacts that may directly affect them.

A search of the Department of Planning and Environment's Major Projects Register, Sydney East Joint Regional Planning Panel Development and Planning Register and Sutherland Shire Development Application Register on 13 November 2014 identified no major developments in the nearby vicinity likely to be constructed at a similar time. Due to the land use constraints surrounding Heathcote (i.e. national parks), the area is also unlikely to experience major redevelopment in the next year that would result in significant cumulative impacts.

During construction the works would be coordinated with any other construction activities in the area with Council, Sydney Trains and any other developers identified to minimise cumulative construction impacts such as traffic and noise.

Traffic associated with the construction work is not anticipated to have a significant impact on the surrounding road network. Operational traffic and transport impacts would have minimal impact on the performance of the surrounding road network.

Based on this assessment it is anticipated that the cumulative impacts would be minor provided that consultation with relevant stakeholders and mitigation measures in Chapter 7 are implemented.

The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed and implemented as appropriate.

6.13 Climate change and sustainability

6.13.1 Greenhouse gas emissions

An increase in greenhouse gas emissions, primarily carbon dioxide, would be expected during construction of the Proposal due to exhaust emissions from construction machinery and vehicles transporting materials and personnel to and from site.

Due to the small scale of the Proposal and the short term temporary nature of the construction works, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 10.

It is anticipated that, once operational, the Proposal would result in an increase in use of public transport and a decrease in use of private motor vehicles by commuters to travel to and from Heathcote. This shift in transport usage would reduce the amount of fuel consumed by private motor vehicles and would result in a relative reduction in associated greenhouse gas emissions in the local area.

6.13.2 Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to changes in the climate and understand the limitations of adaptation. The effects of climate change on the Sydney region can be assessed in terms of weather changes, storm intensity, flooding and increased risk of fire. Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall expected to occur in a 100-year average recurrence interval flood event would occur more frequently. Such changes in weather in the region are unlikely to impact on the operation of the Proposal.

6.13.3 Sustainability

The design of the Proposal has been based on the principles of sustainability, including the *Sustainable Design Guidelines for Rail – Version 3.0* (TfNSW, 2013a) and TfNSW's EMS. These Guidelines would be applied to the detailed design of the Proposal and require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.1.4 for more information regarding the application of the Guidelines.

Further positive impacts in relation to climate change and sustainability associated with the Proposal include encouraging a reduction in private vehicle use and increasing the accessibility of public transport services.

7 Environmental management

This chapter of the REF identifies how the environmental impacts of the Proposal would be managed through environmental management plans and mitigation measures. Section 7.2 lists the proposed mitigation measures for the Proposal to minimise the impacts of the Proposal identified in Chapter 6.

7.1 Environmental management plans

A CEMP for the construction phase of the Proposal would be prepared in accordance with the requirements of TfNSW's EMS. The CEMP would provide a centralised mechanism through which all potential environmental impacts relevant to the Proposal would be managed, and outline a framework of procedures and controls for managing environmental impacts during construction.

The CEMP would include as a minimum the following management plans:

- Construction Traffic Management Plan
- Construction Noise and Vibration Management Plan
- Erosion and Sediment Control Plan
- Waste Management Plan.

The CEMP would incorporate as a minimum all environmental mitigation measures identified below in Section 7.2, any conditions from licences or approvals required by legislation, and a process for demonstrating compliance with such mitigation measures and conditions.

7.2 Mitigation measures

Mitigation measures for the Proposal are listed below in Table 10. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6, should the Proposal proceed.

Table 10: Proposed mitigation measures

Mitigation measures	
General	
1	An Environmental Controls Map (ECM) would be developed prior to commencement of construction in accordance with TfNSW's <i>Guide to Environment Control Map</i> (TfNSW, 2013d). The ECM would be implemented for the duration of construction.
2	A project risk assessment including environmental aspects and impacts would be undertaken prior to the commencement of construction.
3	Weekly inspections to monitor environmental compliance and performance would be undertaken during construction.
4	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, mitigation measures and conditions of approval.

Mitigation measures

- 5 Detailed design of the Proposal would be undertaken in accordance with the *Sustainable Design Guidelines for Rail – Version 3.0* (TfNSW, 2013a) and include appropriate fire management measures.
- 6 Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.

Traffic and site access

- 7 A Road Safety Audit would be undertaken during detailed design and design amendments made as required.
- 8 Prior to the commencement of construction a CTMP would be prepared as part of the CEMP and would include as a minimum:
 - Procedures for preparing and implementing TCPs.
 - Final construction traffic approach and departure routes.
 - Locations of access to and from the local road network and contractor parking.
 - Details of construction signage, traffic controllers (in particular for reversing out of the site) and other community notification.
 - Measures to limit temporary parking losses (e.g. staged construction in car parks).
 - Measures to maintain customer access to and from the station at all times.
 - Measures to maintain private property access unless otherwise agreed.
 - Consultation with the relevant roads authorities would be undertaken during preparation of the CTMP.
- 9 Heavy vehicles would be restricted to specified routes, with the aim of minimising impacts on local roads, high pedestrian areas and school zones. Where feasible, route markers would be installed for heavy vehicles along designated routes.
- 10 The impacts of construction traffic on the local road network and the impacts on intersection operation would be minimised by undertaking construction vehicle traffic movements outside of peak road traffic periods and outside of school peak period.
- 11 The queuing and idling of construction vehicles in residential streets would be minimised through staging of deliveries where practicable.
- 12 Communication would be provided to the community and local residents to inform them of impacts to vehicle movements and anticipated effects on the local road network relating to site works.
- 13 Access to all private properties and businesses adjacent to the works would be maintained during construction, unless otherwise agreed by relevant property owners.
- 14 Should road closure be required, signage would be erected to clearly delineate alternative access and that nearby businesses would operate as normal.
- 15 Pedestrian access to and from the station would be maintained at all times during construction.
- 16 The performance of all project traffic arrangements would be monitored during construction.
- 17 Road Occupancy Licences for temporary closure of roads would be obtained, where required.

Mitigation measures

Urban design, landscape and visual amenity

- 18 Work/site compounds would be screened, with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
- 19 Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
- 20 Light spill from the rail corridor into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
- 21 All lighting would be designed and installed in accordance with the requirements of standards relevant to AS 4282:1997 *Controlling the Obtrusive Effects of Outdoor Lighting*.
- 22 Rehabilitation planting would be undertaken as early as possible to replace vegetation that provided screening to adjacent residential properties and sensitive visual receivers.
- 23 Graffiti would be removed in accordance with TfNSW's standard requirements.
- 24 Wayfinding signage would be installed as per TfNSW guidelines.

Noise and vibration

- 25 Prior to commencement of works, a CNVMP would be prepared and implemented in accordance with the requirements of the *Construction Noise Strategy* (TfNSW, 2012b) and the Noise and Vibration Impact Assessment for the Proposal (SLR, 2014). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
- 26 Works would generally be carried out during normal work hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). While some out of hours works would be required (i.e. during possessions) an Out of Hours Work approval would need to be obtained from TfNSW by the Contractor.
- 27 To reduce the construction noise impact from human activities, reasonable and feasible noise mitigation options should be considered, including:
- Regularly training workers and contractors (such as at toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise.
 - Using only the equipment necessary for the upgrade works at any one time.
 - Avoiding any unnecessary noise when carrying out manual operations and when operating plant.
 - Ensuring spoil is placed and not dropped into awaiting trucks.
 - Avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where possible.
 - Switching off any equipment not in use for extended periods e.g. heavy vehicles engines should be switched off whilst being unloaded.

Mitigation measures

- Avoiding deliveries at night/evenings wherever possible.
- No idling of delivery trucks.
- Keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site.
- Minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite. No dropping of materials from height where practicable, throwing of metal items and slamming of doors.

28 To reduce the construction noise and vibration impacts from mechanical activities, reasonable and feasible noise mitigation options should be considered, including:

Maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances.

Directing noise-emitting plant away from sensitive receivers.

Regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc.

Using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day).

Fitting mufflers/silencers to pneumatic tools (e.g. breakers) and use residential-grade mufflers on plant.

Use of quieter and less vibration emitting construction methods where feasible and reasonable.

29 Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding should take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.

30 Where the $L_{Aeq(15\text{minute})}$ construction noise levels are predicted to exceed 75 dBA, respite periods would be observed. This would include restricting the hours that very noisy activities can occur.

Indigenous heritage

31 All construction staff would receive basic training in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to both the Indigenous and non-Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.

32 If Indigenous objects are located during works, all works must stop in the vicinity of the find, and the NSW Office of Environment and Heritage, Local Aboriginal Land Council and an archaeologist would be notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained before works recommence.

33 If the design of the Proposal is changed, and areas not previously surveyed are to be impacted, further archaeological assessment would be undertaken. Should any indigenous heritage items be found, they would be identified on the Contractor's environmental constraints maps.

Mitigation measures

Non-indigenous heritage

- 34 Non-indigenous heritage items would be identified on the Contractor's environmental constraints map/s.
- 35 A heritage induction would be provided to workers before construction begins, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction.
- 36 In the event that any unanticipated archaeological deposits are identified within the project site during construction, work likely to impact on the deposit would cease immediately and a suitably qualified heritage consultant would be contacted and directed by TfNSW. Where it is required further, archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location

Socio-economic

- 37 Sustainability criteria for the Proposal would be established to encourage the Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.
- 38 Feedback through the submissions process would be encouraged and facilitate opportunities for the community and stakeholders to have input into the project, where possible.
- 39 A Community Liaison Plan would be prepared by the Contractor to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible.
- 40 Contact details for a 24-hour construction response line, project infoline and email address would be provided for ongoing stakeholder contact throughout the construction phase.
- 41 The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction.

Biodiversity

- 42 All workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity (i.e the Royal National Park).
- 43 Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal.
- 44 Tree Protection Zones (TPZs) should be established around trees to be retained, as nominated in the Flora and Fauna Impact Assessment (GHD, 2014). Tree protection should be undertaken in line with *AS4970-2009 Protection of Trees on Development Sites* and should include exclusion fencing of TPZs.
- 45 Trees to be removed as nominated in the Flora and Fauna Impact Assessment (GHD, 2014) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures discussed above.
- 46 An ecologist would be required to inspect all hollow bearing trees prior to removal to check for active nests (i.e. Tree 14); and to supervise vegetation clearing and relocate fauna, if required.

Mitigation measures

- 47 In the event of any tree to be retained becoming damaged during construction, an arborist would be informed immediately to inspect and provide advice on remedial action where possible.
- 48 Should onsite works determine the removal or trimming of any additional trees, TfNSW's Tree Removal Application Form would need to be completed and submitted to TfNSW for approval.
- 49 Weed control measures would be developed and implemented by the CEMP to manage the dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal in accordance with the *Noxious Weeds Act 1993*.
- 50 Vehicles and other equipment would be used onsite would be cleaned to minimise seeds and plant material entering the site to prevent the introduction of further exotic plant species.
- 51 Mulching and watering would be undertaken until plants are established.
- 52 Offsets and/or landscaping would be undertaken in accordance with TfNSW's *Vegetation Offset Guideline* (TfNSW, 2013b) and in consultation with Sutherland Shire Council and Sydney Trains. Approximately seven trees are earmarked for removal and should be offset with 30 trees as advised in the Flora and Fauna Impact Assessment (GHD, 2014). Any additional clearing would also require tree offset planting.

Soils and water

- 53 Prior to commencement of works, Erosion and Sediment Control Plans would be prepared in accordance with the *'Blue Book' Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004). The Erosion and Sediment Control Plans would be established prior to the commencement of construction and be updated and managed throughout as relevant to the activities during the construction phase. Measures would include:
- Stabilised surfaces would be reinstated as quickly as practicable after construction.
 - All stockpiled materials would be stored in bunded areas, covered appropriately and kept away from waterways to avoid sediment entering the waterways.
 - Sediment would be prevented from moving off-site and sediment laden water prevented from entering any watercourse, drainage line or drainage inlet.
 - Any material transported onto pavement surfaces would be swept and removed at the end of each working day.

Erosion and sediment control measures would be implemented and maintained to:

- Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets.
 - Reduce water velocity and capture sediment onsite.
 - Minimise the amount of material transported from site to surrounding pavement surfaces.
 - Divert clean water around the site.
- 54 Erosion and sediment control measures would be established prior to any clearing and grubbing and site establishment activities.
- 55 Erosion and sediment control measures would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality.
- 56 Works would be avoided during heavy rainfall (or whilst the ground remains sodden) to minimise vehicle disturbance to the topsoil.

Mitigation measures

- 57 Erosion and sediment control measures would be left in place until the works are complete and areas are stabilised.
- 58 Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/ oil leaks.
- 59 All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards and EPA Guidelines.
- 60 Construction plant, vehicles and equipment would be refuelled off-site, or in a designated refuelling area.
- 61 Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the TfNSW *Chemical Storage and Spill Management guidelines* during the construction phase. All staff would be made aware of the location of the spill kit and be trained in its use.
- 62 The existing Sydney Trains and Council drainage systems would remain operational throughout the construction of the project.
- 63 Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (Department of Environment, Climate Change and Water, 2009) and *Water Discharge and Reuse Guideline* (TfNSW, 2013c).
- 64 In the event of an incident, works would cease in the immediate vicinity and the EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act.

Air quality

- 65 Methods for management of emissions would be incorporated into project inductions, training and pre-start talks.
- 66 Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
- 67 Visual monitoring of dust would be undertaken, where visible levels of dust are high, onsite activities would be reviewed, with additional control measures and/or varied site operations implemented if required.
- 68 Stockpiles would be covered when not in use.
- 69 Dust would be visually monitored and where necessary the following measures implemented:
- Apply water (or alternate measures) to exposed surfaces that are causing dust generation. Surfaces may include unpaved roads, stockpiles, hardstand areas and other exposed surfaces (for example recently graded areas).
 - Appropriately cover loads on trucks transporting material to and from the construction site. Securely fix tailgates of road transport trucks prior to loading and immediately after unloading.
- 70 Prevent where possible, or remove, mud and dirt being tracked onto sealed road surfaces.
- 71 Plant and machinery would be regularly checked and maintained in a proper and efficient condition.

Mitigation measures

Waste and contamination

- 72 A Waste Management Plan would be prepared by the Contractor that would identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities along with other onsite management practices such as keeping areas free of rubbish.
- 73 An appropriate Unexpected Finds Protocol, incorporating asbestos and other potential contaminants, would be included in the CEMP. This would include procedures for handling asbestos contaminated materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal would be undertaken in accordance with WorkCover requirements.
- 74 Further investigations of potential contamination would be undertaken if areas identified in the contamination report (Greencap, 2014) such as the platform hardstand and rail siding are at risk of being exposed or disturbed during construction.
- 75 All spoil would be tested to confirm presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility.

Cumulative impacts

- 76 The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed and implemented as appropriate.

8 Conclusion

This REF has been prepared in accordance with the provisions of section 111 of the EP&A Act, taking into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The Proposal would provide the following benefits:

- improved accessibility for customers in to Heathcote Station, including provision of an accessible route for the mobility impaired to both station platforms through provision of accessible parking, lift and footbridge
- a connecting link from the new station footbridge with the footbridge over the Princes Highway (currently being constructed by RMS), to provide public access to both sides of the station and across the Princes Highway
- improving connections with the wider pedestrian network with new pedestrian access along Wilson Parade to the station, and from the Princes Highway through the western car park to the station
- improved and safer traffic flow through the eastern car park through the addition of a new entry access, pedestrian crossings and additional lighting
- improved transport interchange facilities including new kiss 'n' ride zones and bicycle facilities
- improved customer amenity and facilities at the station, including family accessible toilet and canopies for weather protection.

The likely key impacts of the Proposal are as follows:

- temporary noise and vibration impacts
- temporary changes to vehicle and pedestrian movements to access the station and car parks
- temporary disruptions to station facilities and amenities
- potential sources of contaminated spoil that would require appropriate management and disposal
- removal of trees/vegetation that would require planting offsets
- introduction of new elements, such as footbridge, into the visual environment.

This REF has considered and assessed these impacts in accordance with clause 228 of the EP&A Regulation and the requirements of the EPBC Act (refer to Chapter 7, and Appendices 1 and 2). Based on the assessment contained in this REF, it is considered that the Proposal is not likely to have a significant impact upon the environment or any threatened species, populations or communities. Accordingly an EIS is not required, nor is the approval of the Minister for Planning.

The Proposal has also taken into account the principles of ESD (refer to Section 4.6). These would be considered further during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

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Appendix 1 – Consideration of Clause 228 factors

The table below demonstrates TfNSW’s consideration of the specific factors of clause 228 of the EP&A Regulation in determining whether the Proposal would have a significant impact on the environment.

Factor	Impacts
<p>(a) Any environmental impact on a community?</p> <p>There would be some temporary impacts to the community during construction would be anticipated, particularly in relation to noise, traffic and access and visual amenity. Mitigation measures outlined in Chapter 7 would be implemented to manage and minimise adverse impacts.</p>	minor
<p>(b) Any transformation of a locality?</p> <p>The Proposal is unlikely to have result in a transformation of the locality surrounding Heathcote Station. The station precinct would be enhanced by the Proposal.</p>	nil
<p>(c) Any environmental impact on the ecosystem of the locality?</p> <p>The Proposal would require removal of some street trees but given the Proposal’s location with an urbanised environment and the low habitat value of the trees to be removed, impacts to biodiversity and ecosystems are expected to be negligible.</p>	nil
<p>(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</p> <p>There would be some temporary impacts during construction particularly in relation to noise, traffic and access and visual amenity.</p> <p>During operation the Proposal would have positive impacts to the community through providing improved access to Heathcote Station.</p>	minor
<p>(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</p> <p>The Proposal would have a positive effect on public transport access and would be sympathetic to the existing surroundings.</p>	nil
<p>(f) Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?</p> <p>The Proposal is unlikely to have any impact on the habitat of protected fauna.</p>	nil
<p>(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</p> <p>The Proposal is unlikely to have any impact on endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.</p>	nil

Factor	Impacts
<p>(h) Any long-term effects on the environment?</p> <p>The Proposal is unlikely to have any long term effects on the environment</p>	nil
<p>(i) Any degradation of the quality of the environment?</p> <p>The Proposal is unlikely to have any degradation on the quality of the environment.</p>	nil
<p>(j) Any risk to the safety of the environment?</p> <p>The Proposal is unlikely to cause any pollution or safety risks to the environment provided the recommended mitigation measures are implemented.</p>	nil
<p>(k) Any reduction in the range of beneficial uses of the environment?</p> <p>The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.</p>	nil
<p>(l) Any pollution of the environment?</p> <p>The Proposal is unlikely to cause any pollution or to the environment provided the recommended mitigation measures are implemented.</p>	nil
<p>(m) Any environmental problems associated with the disposal of waste?</p> <p>The Proposal is unlikely to cause any environmental problems associated with the disposal of waste.</p> <p>All waste would be managed and disposed of with a site-specific Waste Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.</p>	nil
<p>(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</p> <p>The Proposal is unlikely increase demands on resources that are or are likely to become in short supply.</p>	nil
<p>(o) Any cumulative environmental effect with other existing or likely future activities?</p> <p>Cumulative effects of the Proposal are described in Chapter 6. Where feasible, environmental management measures would be coordinated to reduce cumulative construction impacts. The Proposal is unlikely to have any significant long term impacts.</p>	minor
<p>(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions.</p> <p>The Proposal would not affect or be affected by any coastal processes or hazards.</p>	nil

Appendix 2 – Consideration of matters of national environmental significance

The table below demonstrates TfNSW's consideration of the matters of NES under the EPBC Act to be considered in order to determine whether the Proposal should be referred to Commonwealth Department of the Environment.

Factor	Impacts
<p>Any impact on a World Heritage property?</p> <p>There are no World Heritage properties in the vicinity of the Proposal.</p>	nil
<p>Any impact on a National Heritage place?</p> <p>There are no National Heritage places in the vicinity of the Proposal.</p>	nil
<p>Any impact on a wetland of international importance?</p> <p>There are no wetlands of international significance in the vicinity of the Proposal.</p>	nil
<p>Any impact on a listed threatened species or communities?</p> <p>It is unlikely that the development of the Proposal would significantly affect any listed species or communities.</p>	nil
<p>Any impacts on listed migratory species?</p> <p>It is unlikely that the development of the Proposal would significantly affect any listed migratory species.</p>	nil
<p>Does the Proposal involve a nuclear action (including uranium mining)?</p> <p>The Proposal does not involve a nuclear action.</p>	nil
<p>Any impact on a Commonwealth marine area?</p> <p>There are no Commonwealth marine areas in the vicinity of the Proposal.</p>	nil
<p>Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources?</p> <p>The Proposal is for a transport facility and is not related to coal seam gas or mining.</p>	nil
<p>Additionally, any impact (direct or indirect) on Commonwealth land?</p> <p>The Proposal would not be undertaken on or near any Commonwealth land.</p>	nil