

Transport Access Program

Pymble Station Upgrade

Review of Environmental Factors





**Transport
for NSW**

Pymble Station Upgrade Review of Environmental Factors

**Transport Access Program
Ref-6531003**

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Abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
CBD	Central Business District
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CLM Act	<i>Contaminated Land Management Act 1997 (NSW)</i>
CNVMP	Construction Noise and Vibration Management Plan
CPTED	Crime Prevention Through Environmental Design
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
DDA	<i>Disability Discrimination Act 1992 (Cwlth)</i>
DPIE	NSW Department of Planning, Industry and Environment
DSAPT	<i>Disability Standards for Accessible Public Transport (2002)</i>
ECM	Environmental Controls Map
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2000 (NSW)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	<i>Fisheries Management Act 1994 (NSW)</i>
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
HV	High Voltage
ICNG	<i>Interim Construction Noise Guideline (Department of Environment and Climate Change, 2000).</i>
Infrastructure SEPP	<i>State Environmental Planning Policy (Infrastructure) 2007 (NSW)</i>

Term	Meaning
IS rating	Infrastructure Sustainability rating under ISCA rating tool (v 1.2)
ISCA	Infrastructure Sustainability Council of Australia
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
LV	Low Voltage
NES	National Environmental Significance
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NSW	New South Wales
OEH	Formerly NSW Office of the Environment and Heritage
OHWS	Overhead Wire Structure
OOHW	Out of hours work
PA system	Public Address system
PDP	Public Domain Plan
POEO Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
RailCorp	(former) Rail Corporation of NSW
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	<i>Roads Act 1993 (NSW)</i>
Roads and Maritime	NSW Roads and Maritime Services (formerly Roads and Traffic Authority)
s170	RailCorp's Section 170 Heritage and Conservation Register
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
TCP	Traffic Control Plan
TfNSW	Transport for NSW
TGSI	Tactile Ground Surface Indicators ("tactiles")
TMP	Traffic Management Plan
TPZ	Tree Protection Zone

Term	Meaning
UDP	Urban Design Plan
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001 (NSW)</i>
WM Act	<i>Water Management Act 2000 (NSW)</i>

Definitions

Term	Meaning
Contractor	The entity appointed by Transport for NSW to undertake the construction of the Proposal. The construction Contractor is responsible for all work on the project, both design and construction.
Detailed design	Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to Transport for NSW acceptance).
Disability Standards for Accessible Public Transport	The Commonwealth <i>Disability Standards for Accessible Public Transport 2002</i> ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth <i>Disability Discrimination Act 1992</i> (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
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.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
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).
NSW Trains	From 1 July 2013, NSW Trains became the new rail provider of services for regional rail customers.
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.
Out of hours work	Defined as work <i>outside</i> standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
Rail possession / shutdown	Shutdown is the term used by railway building/maintenance personnel to indicate that they have taken possession of the track (usually a section 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.
Scoping design	The scoping design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).

Term	Meaning
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 CityRail as the provider of metropolitan train services for Sydney.
Tactiles	Tactile tiles or Tactile Ground Surface Indicators (TGSIs) are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms.
The Proposal	The construction and operation of the Pymble Station Upgrade
Vegetation Offset Guide	<p>The Transport for NSW 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 5.5 of the EP&A Act.</p> <p>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 15 cm.</p>

Executive summary

Overview

The NSW Government is improving accessibility at Pymble Station. This project is being delivered as part of the Transport Access Program, a NSW Government Initiative to provide a better experience for public transport customers by delivering accessible, modern secure and integrated transport infrastructure.

As part of this program, the Pymble Station Upgrade (the Proposal) would aim to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams, and customers with luggage.

The Proposal would provide:

- three new lifts connecting the existing footbridge to the Grandview Street Station entrance, the Pacific Highway station entrance and the station platform
- upgrades to the Grandview Street station entrance including a widened footpath to allow for a new lift landing with a canopy
- modifications to the existing taxi rank and no parking zone to accommodate the widened footpath on Grandview Street
- two new accessible parking spaces and one accessible kiss and ride space at the Pacific Highway station entrance car park
- upgrades to the Pacific Highway station entrance including:
 - a three stop lift connecting the car park / accessible parking, the bus stop at street level and the footbridge
 - a new accessible path to the lift landing with a new canopy at car park level
 - a new lift landing at street level with footpath upgrades
 - a new widened stair entrance with canopy upgrades.
- upgrades to the existing footbridge including canopy extensions and anti-throw screens, and the conversion of the vacant kiosk to allow for a new lift landing
- canopy extension at platform level from the lift to the boarding assistance zone
- a new family accessible toilet and unisex ambulant toilet within the station building
- upgrade work to the existing stairs including replacement of treads and handrails
- improvements to station lighting and CCTV to improve safety and security
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system upgrade and new hearing induction loops
- modifications to the rail corridor fencing at the Grandview Street and Pacific Highway station entrances
- electrical upgrades for the new infrastructure, including a new padmount substation.

Transport for NSW (TfNSW) is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the Proposal.

This Review of Environmental Factors (REF) has been prepared to assess all matters affecting or likely to affect the environment by reason of the construction and operation of the

Proposal under the provisions of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Subject to approval, construction is expected to commence in early 2021 and take around 24 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF. An overview of the Proposal is shown in Figure 1.

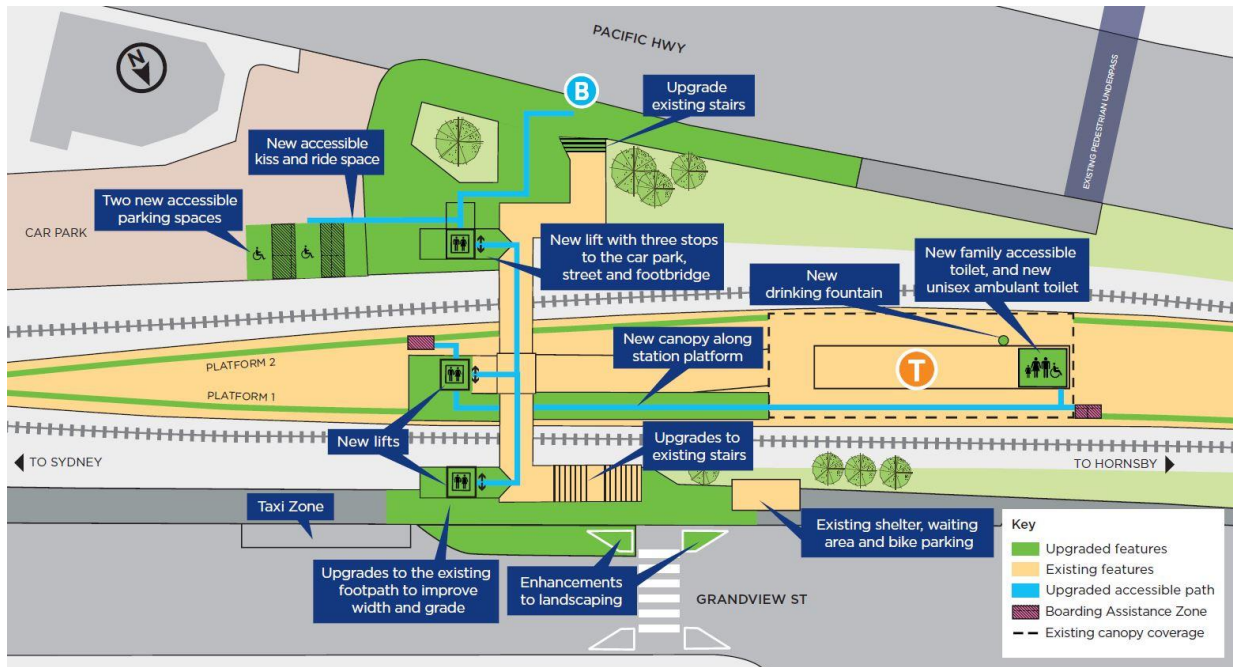


Figure 1 Key features of the Proposal (indicative only, subject to detailed design)

Need for the Proposal

The Proposal would ensure that Pymble Station meets legislative requirements under the *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

The Proposal is designed to drive a stronger customer experience outcome, to deliver improved travel to and between modes, encourage greater public transport use and better integrate interchanges with the role and function of town centres. The Proposal would also assist in responding to forecasted growth in the region and as such would support growth in commercial and residential development.

Chapter 2 of this REF further describes the need for the proposal and outlines the options considered in developing the design.

Community and stakeholder consultation

Key stakeholders for Pymble Station were engaged during development of the scoping design plan to provide insights into the scope of work for the Proposal, and to also participate in the development and assessment of the station improvement options.

Early community engagement was undertaken between 23 September and 7 October 2020 to provide the community an opportunity to have their say on the early scoping designs. The feedback received from the community was provided to the project team for consideration and to help inform the planning process and documentation.

Community consultation activities for the Proposal would be undertaken during the public display period of this REF with the public invited to submit feedback to help TfNSW understand what is important to customers and the community. The REF would be displayed for a period of two weeks. Further information about these specific consultation activities is included in Section 5.3 of this REF.

During the display period a Project Infoline (1800 684 490) and email address (projects@transport.nsw.gov.au) would also be available for members of the public to make enquiries.

In accordance with the requirements of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), consultation is required with local councils and/or public authorities in certain circumstances, including where council managed infrastructure is affected. Consultation has been undertaken with Ku-ring-gai Council and Sydney Trains during the development of design options and the preferred option. Consultation with these stakeholders will continue through the detailed design and construction of the Proposal.

Feedback can be sent to:

- projects@transport.nsw.gov.au

Or submitted:

- via the feedback box on the project webpage
<https://www.transport.nsw.gov.au/projects/current-projects/pymble-station-upgrade>
- via nsw.gov.au/improving-nsw/have-your-say/pymble-station-upgrade

Transport for NSW 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 2 Planning approval and consultation process for the Proposal shows the planning approval and consultation process for the Proposal.

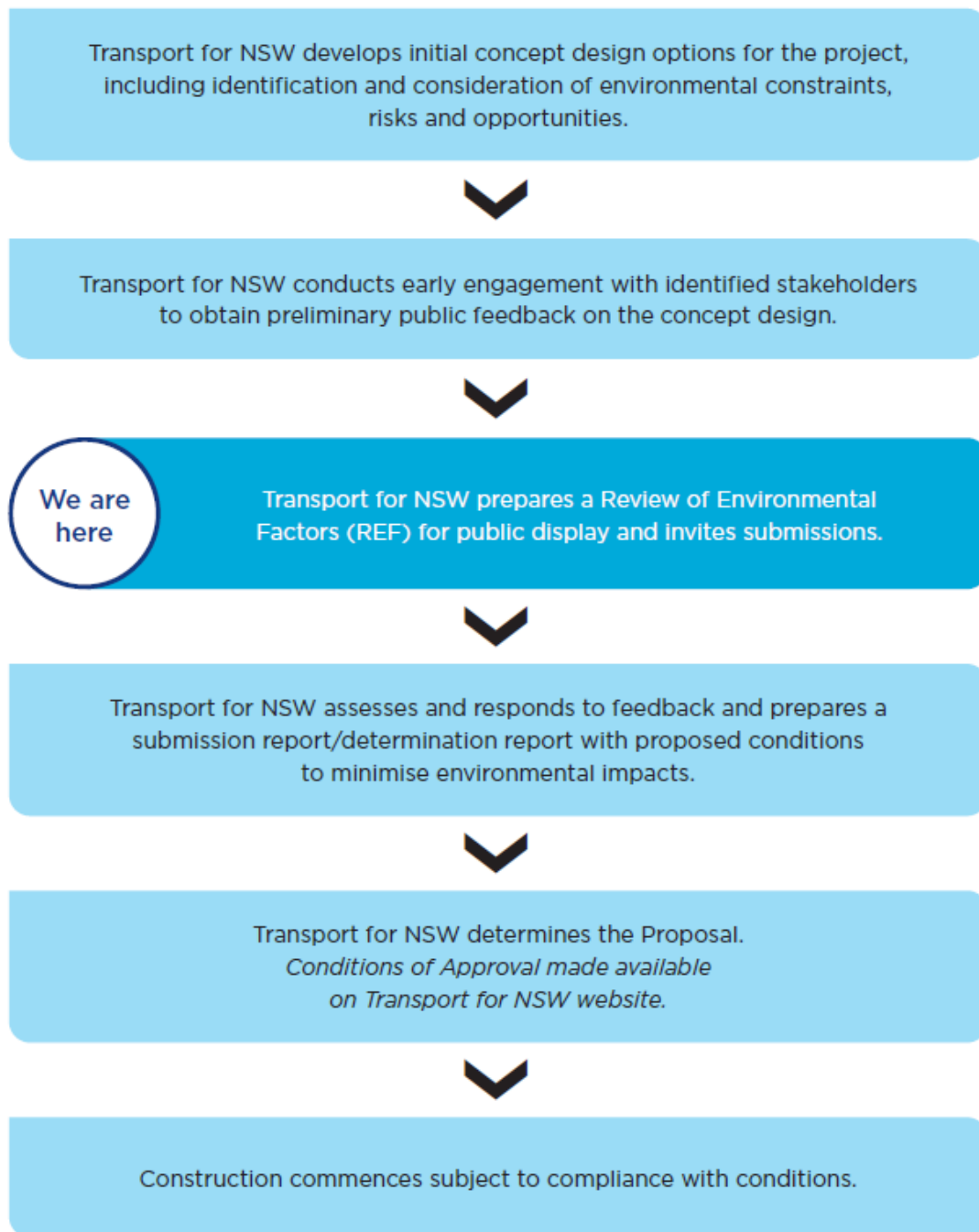


Figure 2 Planning approval and consultation process for the Proposal

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 Proposal would provide the following benefits:

- improved and equitable access to Pymble Station for customers resulting from the installation of lifts, accessible parking and platform canopies

- improved station amenity and safety for customers at the station resulting from the installation of the family accessible toilet, unisex ambulant toilet, new lighting and CCTV
- improved safety of the pedestrian footbridge by installing new tactiles and handrails.

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

- removal of up to 16 trees for utility relocation and the installation of the new lifts, which would be offset with 76 locally endemic native species. However, further investigations would be undertaken during detailed design to determine the potential for the retention of species along Grandview Street and at the Pacific Highway station entrances
- impacts to the heritage fabric of Pymble Station for the installation of the new lifts, modifications to the Pacific Highway station entrance, and a new platform canopy
- temporary changes to pedestrian movements during construction work
- temporary changes to traffic movements as a result of the upgrade work on Grandview Street and the delivery of construction plant and materials
- temporary noise and vibration impacts during construction, with six residential receivers (apartment complexes) identified as potentially highly noise affected (with noise levels above 75 decibels) during the vegetation removal and demolition stages of construction.

Further information regarding these impacts is provided in Chapter 6 of the REF.

Conclusion

This REF has been prepared having regard to sections 5.5 and 5.7 of the EP&A Act, and clause 228 of the EP&A Regulation, to ensure that Transport for NSW 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 Infrastructure Sustainable Council of Australia (ISCA) Infrastructure Sustainable (IS) Rating Tool (v 1.2) taking into account the principles of ecologically sustainable development (ESD).

Should the Proposal proceed, any potential associated adverse impacts would be appropriately managed in accordance with the mitigation measures outlined in this REF, and the Conditions of Approval imposed in the Determination Report. This would ensure the Proposal is delivered to maximise benefit to the community and minimise any adverse impacts on the environment.

In considering the overall potential impacts and proposed mitigation measures outlined in this REF, the Proposal is unlikely to significantly affect the environment including critical habitat or threatened species, populations, ecological communities or their habitats.



Figure 3 Photomontage of the Proposal from Grandview Street (indicative only, subject to detailed design)

1 Introduction

Transport for New South Wales (Transport for NSW) is responsible for strategy, planning, policy, procurement, regulation, funding allocation and other non-service delivery functions for all modes of transport in NSW including road, rail, ferry, light rail, point to point, cycling and walking. Transport for NSW is the proponent for the Pymble Station Upgrade (the 'Proposal').

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

The Pymble Station Upgrade, the subject of this Review of Environmental Factors (REF), forms part of the Transport Access Program. This Program is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

The Proposal would improve accessibility of the station in line with the requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT). The needs and objectives of the Proposal are further discussed in Chapter 2 of this REF.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- three new lifts connecting the existing footbridge to the Grandview Street station entrance, the Pacific Highway station entrance and the station platform
- upgrades to the Grandview Street station entrance including a widened footpath to allow for a new lift landing with a canopy
- modifications to the existing taxi rank and no parking zone to accommodate the widened footpath on Grandview Street
- two new accessible parking spaces and one accessible kiss and ride space at the Pacific Highway station entrance car park
- upgrades to the Pacific Highway station entrance including:
 - a three stop lift connecting the car park / accessible parking, the bus stop at street level and the footbridge
 - a new accessible path to the lift landing with a new canopy at car park level
 - a new lift landing at street level with footpath upgrades
 - a new widened stair entrance with canopy upgrades.
- upgrades to the existing footbridge including canopy extensions and anti-throw screens, and the conversion of the vacant kiosk to allow for a new lift landing
- canopy extension at platform level from the lift to the boarding assistance zone
- a new family accessible toilet and unisex ambulant toilet within the station building
- upgrade work to the existing stairs including replacement of treads and handrails
- improvements to station lighting and CCTV to improve safety and security

- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system upgrade and new hearing induction loops
- modifications to the rail corridor fencing at the Grandview Street and Pacific Highway station entrances
- electrical upgrades for the new infrastructure, including a new padmount substation.

Subject to planning approval, construction is expected to commence in early 2021 and take around 24 months to complete.

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

1.2 Location of the Proposal

The Proposal would involve upgrade work to Pymble Station, which is located in the suburb of Pymble in the Ku-ring-gai Local Government Area (LGA) about 15 kilometres northwest of the Sydney Central Business District (CBD). The location of the station and its regional context is shown in Figure 4.

Pymble Station consists of a single island platform and is serviced by the T1 North Shore Line. It is bound by Grandview Street to the north and Pacific Highway to the south, with the footbridge crossing over the rail corridor and providing pedestrian access to the station, Pymble shopping village at Grandview Street and the Pacific Highway. The Proposal includes upgrades to Pymble Station on land owned by the NSW Transport Asset Holding Entity, and managed by Sydney Trains within the station precinct, with some work also proposed along the station entrances which are managed by Ku-ring-gai Council.

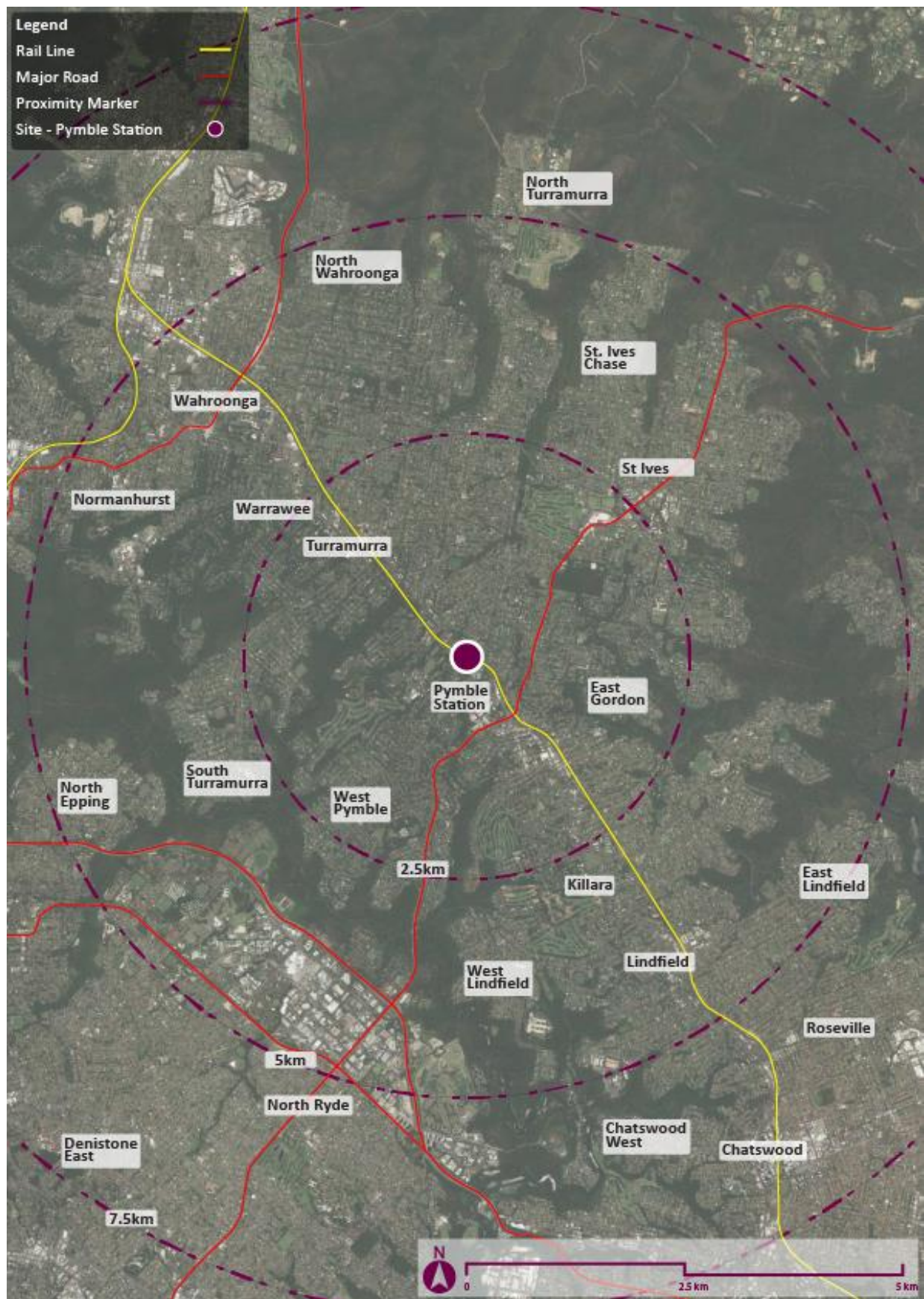


Figure 4 Regional context

1.3 Existing infrastructure and land uses

1.3.1 Pymble Station

Pymble Station is accessed by a singular set of stairs off the pedestrian footbridge connecting Grandview Street and the Pacific Highway, providing a link to the platform level (refer to Figure 6, Figure 7 and Figure 8). Platform 1 provides services to Central Station and Platform 2 provides services to Hornsby. A small vacant kiosk is located directly above the station on the footbridge.

A bus stop is located at the Pacific Highway station entrance. There is a taxi rank located on Grandview Street which is also accessed from the footbridge. The car park located at the Pacific Highway station entrance is leased to Ku-ring-gai Council, and is primarily used by the commercial businesses on the Pacific Highway.

There are two car parks located within the Pymble shopping village to the north of the station, however the commuter car parking is mostly in the local streets, particularly east along Grandview Street. There are bicycle parking facilities at both station entrances, providing capacity for 12 bicycles in total.

The Pacific Highway has a road bridge and footpath which crosses the rail corridor over the north-western end of the platform. There is a pedestrian underpass under the Pacific Highway which connects the station to the medium to high density residential areas and Pymble Ladies' College on Avon Road.

Pymble Station Group is listed on RailCorp's Section 170 Heritage and Conservation Register (s170 register). Pymble Station is considered to have local significance as the opening of the railway in 1890 was instrumental in encouraging rapid subdivision and development of the area. The footbridge, station building (Figure 9) and the platform remain in good condition and retain heritage significance in terms of integrity and aesthetics.

1.3.2 Land uses

Under the *Ku-ring-gai Local Environmental Plan (Local Centres) 2012* (Ku-ring-gai LEP), the rail infrastructure is zoned SP2 Infrastructure (classified railway). The proposed work to the interchange facilities are within the Pymble shopping village to the north which is zoned B2 Local Centre. Land to the east of the proposal adjacent to the Pacific Highway car park is zoned B5 Business Development. There is land zoned public recreation approximately 100 metres north of the rail corridor (Robert Pymble Park). Residential areas to the east of Pymble shopping village and to the south of the Pacific Highway are zoned R4 High Density Residential.

There are two schools located within 500 metres of the station including:

- Pymble Ladies' College located on the southern side of the Pacific Highway approximately 100 metres northwest of the station
- Sacred Heart Catholic School located approximately 500 metres to the northwest.

Pymble Pinjarra Preschool is located approximately 160 metres northeast of the station. Hamilton Funerals and Pymble Hotel are located approximately 100 metres to the northwest, with Ku-ring-gai Town Hall located approximately 300 metres northwest of the station.



Figure 5 Site locality map



Figure 6 Grandview Street station entrance and footbridge



Figure 7 Pacific Highway station entrance



Figure 8 View of the platform from the footbridge



Figure 9 Station building

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by RPS on behalf of Transport for NSW to assess the potential impacts of the Pymble Station Upgrade. For the purposes of this work, Transport for NSW is the proponent and the determining authority under Division 5.1 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 5.5 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* (EP&A Regulation).

This assessment has also considered the relevant provisions of other relevant environmental legislation, including the *Biodiversity Conservation Act 2016* (BC 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 have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of the Environment and Energy for any necessary approvals under the EPBC Act. Refer to Chapter 4 for more information on statutory considerations.

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 summary 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 Pymble Station Upgrade, the subject of this REF, forms part of the Transport Access Program. This program is designed to drive a stronger customer experience outcome 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.

Table 2-1 provides an overview of NSW Government policies and strategies relevant to the Proposal.

Table 2-1 Key NSW Government policies and strategies applicable to the Proposal

Policy / Strategy	Overview	How the Proposal aligns
<i>Future Transport Strategy 2056</i> (TfNSW, 2018a)	<p><i>Future Transport 2056</i> is an update of NSW's <i>Long Term Transport Master Plan</i>. It is a suite of strategies and plans for transport to provide an integrated vision for the state.</p> <p><i>Future Transport 2056</i> identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport and the provision of accessible transport services.</p>	<p>The Transport Access Program is identified in the Strategy as an example of the NSW Government working to improve accessibility of the rail network. As identified in the Strategy, the delivery and modernisation of infrastructure would allow greater access for people with disabilities and those with limited mobility.</p> <p>The Proposal would assist in meeting the following State-wide outcomes detailed in <i>Future Transport 2056</i>:</p> <ul style="list-style-type: none"> • encouraging active travel (walking and cycling) and using public transport • a fully accessible network that enables barrier-free travel for all.
<i>Disability Inclusion Action Plan (2018-2022)</i> (TfNSW, 2017a)	<p>The <i>Disability Inclusion Action Plan 2018-2022</i> was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, in parallel with the development of <i>Future Transport 2056</i>. The Plan builds on the objectives of <i>Future Transport 2056</i> in relation to accessibility to transport.</p>	<p>The Transport Access Program has been identified in this Plan as a key action to ensure transport networks in Sydney are accessible for all potential users.</p> <p>The Proposal has been developed with consideration of the objectives outlined in this Plan and seeks to improve and provide equitable access to public transport facilities.</p>
<i>A Metropolis of Three Cities -</i>	<p>The <i>Greater Sydney Region Plan</i> is the NSW Government's 40-year land use plan for Sydney. It establishes a</p>	<p>The Proposal would enable equitable access to services and employment as well as social and cultural</p>

Policy / Strategy	Overview	How the Proposal aligns
Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City. One of the ten directions of the framework is a well-connected city, by developing a more accessible and walkable city, through optimising existing infrastructure where possible.	opportunities through investment in transport. The proposed upgraded infrastructure and station entrances would promote public transport movements, walking, cycling and social opportunity, which contribute to the character and identity of the area.
North District Plan (Greater Sydney Commission, 2018b)	The <i>North District Plan</i> has been prepared to align with the visions and objectives of the <i>Greater Sydney Region Plan</i> . The North District (which includes Pymble) forms a large part of the Eastern Harbour City, and its economy leans to the Harbour CBD, which is the North District's metropolitan centre. Major transport investments in the district are critical to support the ongoing strengths of the District.	<p>Planning priority N6 of the <i>North District Plan</i> is about creating and renewing great places and local centres, and respecting the District's heritage.</p> <p>The Proposal has been designed to preserve the heritage values of the station and surrounding area.</p> <p>Recognising the importance of accessibility, inclusion and safety through the design of public transport interchanges would encourage physical and social activity for a greater cross-section of the community.</p>
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	<p>The <i>State Infrastructure Strategy 2018-2038</i> makes recommendations for each of NSW's key infrastructure sectors including transport.</p> <p>Public transport is viewed as critical to productivity, expanding employment opportunities by connecting people to jobs, and reducing congestion.</p>	<p>The Proposal would upgrade public transport services to provide access for a wider range of customers. It would also involve the upgrade of existing infrastructure which aligns with an objective of the strategy to optimise the use of the State's existing assets.</p>
Ku-ring-gai Integrated Transport Strategy (Ku-ring-gai Council, 2011)	<p>The <i>Ku-ring-gai Integrated Transport Strategy</i> outlines a strategic framework with actions and targets to improve the efficiency, safety, and sustainability of transport options for residents of the area. This includes aiming to increase the share of trips by public transport and reducing car dependency. Objective B5 of the Travel Demand Management Action Plan is to develop and support transport services that are accessible to all members of the community.</p>	<p>The Strategy identifies that accessible transport for older people and those less mobile needs to be a key component of Ku-ring-gai's transport system. The Proposal would improve the accessibility of Pymble Station and assist in allowing a greater proportion of the population to use public transport.</p>
Our Ku-ring-gai 2038 (Ku-ring-gai Council, 2018)	<p><i>Our Ku-ring-gai 2038</i> is the Community Strategic Plan for Ku-ring-gai Council which identifies the community's vision, goals and strategies for the future. The Strategic Plan has a focus on creating accessible and reliable public transport that is safe and well maintained, and available to all.</p>	<p>The Proposal would assist in meeting the goals of <i>Our Ku-ring-gai 2038</i> of creating an accessible public transport network that meets the diverse and changing needs of the community. The Proposal would align with the population growth and ensure that public transport services are able to be used by a greater proportion of the community.</p>

2.2 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. The program aims to provide:

- stations that are accessible to those with disabilities, the ageing and parents/carers with prams and customers with luggage
- 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.

2.3 Objectives of the Proposal

The specific objectives of the Pymble Station Upgrade are to:

- provide a station that is accessible to those with a disability, the ageing and parents/carers with prams and customers with luggage
- improve customer experience (weather protection, better interchange facilities and visual appearance)
- minimise pedestrian conflict and crowding points
- improve integration with the surrounding precinct
- improve customer safety (CCTV, lighting, stair and handrail upgrades)
- improve wayfinding in and around the station
- respond to the heritage values of the station
- improve customer amenity
- minimise impacts to existing vegetation.

2.4 Design development

Options for improving access to Pymble Station were developed following workshops with a stakeholder working group that included representatives from Transport for NSW and the design team. Two design options were developed from those workshops which are further discussed below.

2.5 Alternative options considered

Improvements common to both options included the installation of three lifts to the existing footbridge connecting both station entrances and the platform, an accessible walkway from the Pacific Highway station entrance to the bus stop and car park, two new accessible parking

spaces, platform regrading, the provision of a family accessible toilet and unisex ambulant toilet, and upgrading of the stairs with compliant handrails, tactiles and nosings.

The key difference between the two options is the positioning of the lift located at the Grandview Street station entrance:

- option 1 – Grandview Street lift facing east
- option 2 – Grandview Street lift facing north with footpath modifications to improve pedestrian flow.

A 'do-nothing' option was also considered where existing access to the platform and station amenities would remain the same and there would be no changes to the way the station currently operates. The NSW Government has identified the need for improving the accessibility of transport 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 meet the requirements of the DDA and DSAPT.

2.5.1 Assessment of identified options

The design options were assessed in a multi-criteria analysis (MCA) that included consideration of the following criteria:

- infrastructure – including supporting existing infrastructure and removing redundant / end of life assets
- facility operations and maintenance – to be safe and efficient
- deliverability – including efficient construction methodologies and timeframes to minimise community impact
- customer experience – including facilities, safety, community and comfort
- transport integration – including connectivity to the transport interchange
- urban design and precinct planning – integration to the surroundings and enabling future development
- environment, sustainability and heritage – to protect and enhance the environment and support sustainability initiatives.

This methodology consisted:

- a quantitative assessment that compared the whole-of-life costs for each option (i.e. both capital expenditure and operational expenditure) which were assessed as similar for both options
- a qualitative assessment which assessed and weighted each option against the criteria listed above.

Further, an analysis of each option against the urban design principles in *Around the Tracks: Urban Design for Heavy and Light Rail* (TfNSW, 2016) was undertaken as part of the Urban Design Report for the Proposal in 2018 (DesignInc, 2018).

2.6 Justification for the preferred option

Through the MCA process, Option 1 was identified as the preferred option. In each category for the MCA framework, Option 1 met the essential requirements for all seven criteria. Option 2 was determined to be not as favourable as Option 1 as it did not meet the essential requirements in two out of seven criteria, namely 'transport integration', and 'environment, sustainability and heritage'. Option 1 provided safer lift egress at Grandview Street and improved symmetry which is desirable for visual and heritage outcomes.

The Urban Design Report also confirmed that Option 1 better met the urban design principles in *Around the Tracks: Urban Design for Heavy and Light Rail* (TfNSW, 2016) as the symmetrical design of the lift on Grandview Street is preferred from a visual and heritage perspective.

2.7 Further design modifications

To improve pedestrian flow and customer experience at the Grandview Street station entrance, the design has been modified to include a widened footpath which in turn requires modifications to the taxi zone and existing no parking zone on Grandview Street. This has enabled the same symmetry of the lifts which was favourable in the preferred option, while also facilitating improved pedestrian flow along Grandview Street.

3 Proposal description

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 scoping design and is subject to detailed design.

3.1 The Proposal

As described in Section 1.1.2, the Proposal involves an upgrade of Pymble Station as part of the Transport Access Program which would improve accessibility and amenities for customers. The description of the Proposal below is based on a scoping design and is subject to detailed design.

The Proposal would include the following key elements:

- three new lifts connecting the existing footbridge to the Grandview Street station entrance, the Pacific Highway station entrance and the station platform
- upgrades to the Grandview Street station entrance including a widened footpath to allow for a new lift landing with a canopy
- modifications to the existing taxi rank and no parking zone to accommodate the widened footpath on Grandview Street
- two new accessible parking spaces and one accessible kiss and ride space at the Pacific Highway station entrance car park
- upgrades to the Pacific Highway station entrance including:
 - a three stop lift connecting the car park / accessible parking, the bus stop at street level and the footbridge
 - a new accessible path to the lift landing with a new canopy at car park level
 - a new lift landing at street level with footpath upgrades
 - a new widened stair entrance with canopy upgrades.
- upgrades to the existing footbridge including canopy extensions and anti-throw screens, and the conversion of the vacant kiosk to allow for a new lift landing
- canopy extension at platform level from the lift to the boarding assistance zone
- a new family accessible toilet and unisex ambulant toilet within the station building
- upgrade work to the existing stairs including replacement of treads and handrails
- improvements to station lighting and CCTV to improve safety and security
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system upgrade and new hearing induction loops
- modifications to the rail corridor fencing at the Grandview Street and Pacific Highway station entrances
- electrical upgrades for the new infrastructure, including a new padmount substation.

Figure 10 shows the general layout of key elements for the Proposal.

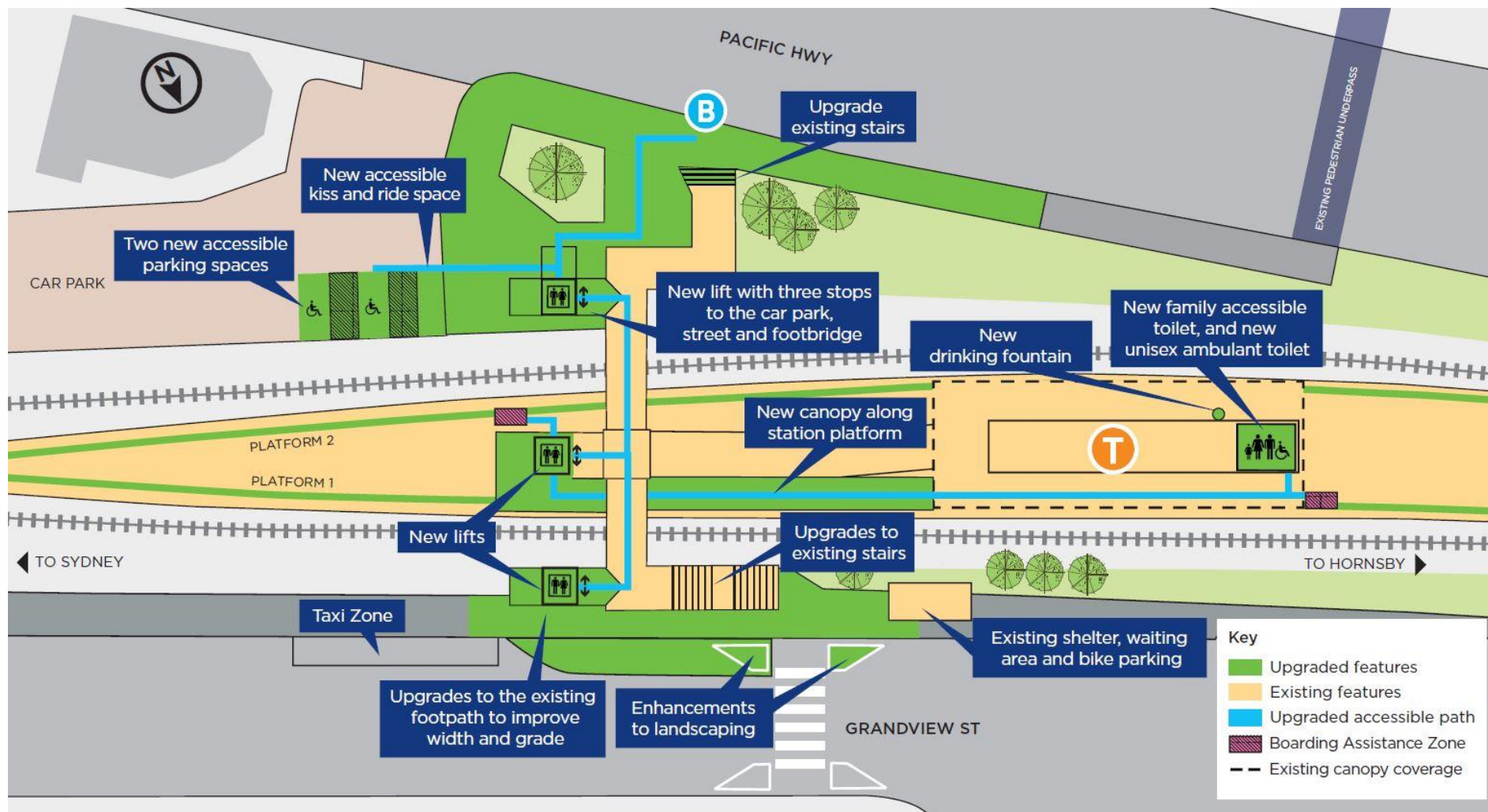


Figure 10 Key features of the Proposal
(Indicative only, subject to detailed design)

3.2 Scope of work

3.2.1 Station access and interchange facilities

Details of the proposed work to take place at the station to improve accessibility and customer experience are detailed below:

- construction and installation of three lifts connecting to the existing footbridge which would include:
 - installation of a lift at the Grandview Street station entrance
 - installation of a lift at the Pacific Highway station entrance from the car park, to the street level and the footbridge
 - installation of a lift on the station platform
 - lift landings with canopies for weather protection at the waiting areas.
- canopy extensions from the platform lift to the boarding assistance zone to provide covered access
- service relocations and adjustments for the installation of the lifts
- retention of the existing footbridge with minor modifications which would include:
 - new stairs and canopy at the Pacific Highway station entrance to create a wider entrance (requires demolition of the existing stairway and portion of the canopy)
 - upgrade work, including regrading at the landings to the lifts, replacement of tactile ground surface indicators (TGSIs) on the stairs and the installation of new directional TGSIs, stair nosings and handrails.
- a new accessible path at the Pacific Highway station entrance connecting the car park to the lift landing, the bus stop on the Pacific Highway and the new widened stair entrance
- modifications to the existing taxi rank and no parking zone to accommodate a widened footpath on Grandview Street
- two new accessible parking spaces and one new accessible kiss and ride space at the Pacific Highway station entrance car park
- localised regrading of the Pacific Highway station entrance from the two new accessible parking spaces and accessible kiss and ride to the lift landing
- landscaping work and adjustments to wayfinding.

3.2.2 Station building and platform modifications

Modifications to the station building and platform would include:

- a new family accessible toilet and unisex ambulant toilet within the station building (to replace the existing male/female toilet facilities). This would include:
 - removal of the existing internal walls and fittings
 - installation of new fittings, fixtures, finishes, services connections (water, wastewater, electrical, and mechanical services)

- adjustments to the doorways and access provisions including the requirement to lower the floors to provide level access and the provision of remote access control.
- upgrades to the electrical distribution board within the station building, including associated trenching and cabling within the platform to connect to the new padmount substation
- improvements to station lighting and CCTV to increase safety and security
- improvements to customer information and communication systems, including public address (PA) system upgrades, new hearing induction loops within the station platforms, and a new Opal card reader at the lift landing on the station platform
- new TGSIs (including along the length of both platform edges and at the base of the footbridge stairs).

3.2.3 Ancillary work

The following ancillary work required as part of the upgrade work would include:

- regrading and resurfacing of the platform to provide accessible paths of travel between the lift, boarding assistance zones, family accessible toilet and other facilities on the platforms
- resurfacing other areas of the platform which are impacted by construction activities, including services trenching work
- new stormwater drainage connections from the new lifts and canopies to the existing stormwater system
- services and utilities protection, adjustments and/or relocations to accommodate the new work
- upgrades to the station power supply to cater for the new lifts including:
 - undergrounding of the overhead wiring in Grandview Street and other aerial lines in proximity to the Proposal
 - replacement of the existing transformer with a new padmount substation
 - modifications to the station distribution board.
- earthing and bonding of electrical equipment and new or modified structures
- fire safety modifications including the provision of a portable fire extinguisher and upgrades to the station distribution board
- adjustments to the station furniture including rubbish bins, payphone and the installation of a new drinking fountain
- new / upgraded wayfinding signage and other station signage
- adjustments to rail corridor boundary and fencing.

3.2.4 Materials and finishes

Materials and finishes for the Proposal have been selected based on the criteria of durability, low maintenance and cost effectiveness, to accord with heritage requirements, to minimise visual impacts, and to be aesthetically pleasing. The lifecycle of the material has also been considered, to assess the environmental impacts from manufacture to the end of life.

Availability and constructability are also important criteria to ensure that materials are readily available, and the structure can be built efficiently. Materials are also selected for their application based on their suitability for meeting design requirements.

Each of the upgraded or new facilities would be constructed from a range of different materials, with a different palette for each architectural element. Subject to detailed design, the Proposal would include the following:

- lower lift shaft – brick facade
- upper lift shaft – steel frame with glass infill panels
- new lift canopies – steel frame with glazed canopy at the platform and ground level and designed to match the existing at footbridge level
- new canopy extension from the lift to the existing station building canopy – steel frame with canopy designed to match the existing
- Pacific Highway station entrance canopy replacement - steel frame with canopy designed to match the existing
- handrails – stainless steel.

The design would be submitted to Transport for NSW's Design Review Panel at various stages for comment before being accepted by Transport for NSW. An Urban Design Plan (UDP) and/or Public Domain Plan (PDP) would also be prepared by the Contractor, prior to finalisation of detailed design for endorsement by Transport for NSW.

3.3 Design development

3.3.1 Engineering constraints

A number of constraints influenced the design development of the Proposal. These are summarised below.

Existing structures: the placement and integrity of existing structures needed to be considered during the development of the design – these structures included the existing platform, the footbridge with the vacant kiosk, footpaths, bus stops and pedestrian crossing, stairs, station building, overhead wiring and associated support structures, seating, light poles, and car parking.

Sydney Trains' requirements: new structures and modifications to existing structures within the rail corridor must be designed and constructed with consideration of train impact loads, structural clearances to the track, and safe working provisions.

Services and utilities: there are a number of services and utilities that have been identified as constructability constraints in proximity to the Proposal including overhead power lines on Grandview Street, a Jemena high pressure gas line in proximity to the rail corridor, communications and fibre optic cables, a nearby water main, and the existing transformer / electrical equipment.

Heritage: Pymble Station is listed on the RailCorp Section 170 Heritage and Conservation Register (4801068). Pymble Station, which opened in 1890, has historical significance as the construction of the railway was instrumental in encouraging the rapid subdivision and development in the area. The station building and the elevated footbridge are considered important visual elements of the station precinct. More information on how heritage has been considered as part of the design development is included in Section 6.5.

Vegetation: Pymble Station is located within an urban environment with streetscapes adjacent to the station characterised by a diversity of native, endemic and exotic plant species.

Landscaping is also evident in the rail corridor, which is heavily planted with species not locally endemic to the wider natural environment. More information on how biodiversity has been considered as part of the design development is included in Section 6.7.

Construction access: for specific construction activities, construction access would require traffic control in the adjacent streets and the use of a large mobile crane would be required to lift construction materials and equipment to the station from these roadways. High traffic movement on the Pacific Highway is considered an engineering constraint during construction.

Public access: maintaining pedestrian access across the bridge, and to the station when the station is operational (i.e. not during rail shutdowns).

Future patronage: the Proposal has been designed to accommodate the forecast Sydney Trains patronage growth (an increase of 15 per cent to 2036) and changing travel patterns.

3.3.2 Design standards

The Proposal would be designed having regard to the following:

- *Disability Standards for Accessible Public Transport 2002* (issued under the Commonwealth *Disability Discrimination Act 1992*)
- Building Code of Australia (also referred to as the National Construction Code)
- relevant Australian Standards
- Asset Standards Authority standards
- Sydney Trains standards
- Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability Rating Scheme (V1.2)
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008)
- Crime Prevention Through Environmental Design (CPTED) principles
- other Transport for NSW policies and guidelines
- relevant council standards.

3.3.3 Sustainability in design

Transport for NSW is committed to minimising the impact on the natural environment and supports ISCA and the Infrastructure Sustainability (IS) rating tool. The IS rating tool was developed and is administered by ISCA. It is an independently verified and nationally recognised rating system for evaluating sustainability across design, construction and operation of infrastructure.

Pymble Station Upgrade is one of a number of projects within the Transport Access Program that is using version 1.2 of the IS rating tool and targeting an 'Excellent' rating. The rating scheme provides an independent and consistent methodology for the application and evaluation of sustainability outcomes in infrastructure projects.

The development of the scoping design for the Proposal has been undertaken in accordance with the project targets identified in the program wide TAP 3 Sustainability Strategy.

The Sustainability Strategy sets targets across the following key issues:

- Climate change adaptation and resilience
- Renewable energy

- Waste
- Materials
- Supply chain management
- Community connection
- Social procurement and workforce.

Key design elements and strategies developed during scoping design would be used to further develop the design and construction.

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to commence in early 2021 and take around 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 Transport for NSW.

The proposed construction activities for the Proposal are identified in Table 3-1. This staging is indicative and is based on the current scoping design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

Table 3-1 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling work	<ul style="list-style-type: none"> • detailed site survey and services locating • vegetation removal and relocation of services to allow for new work • establish site compound (i.e. erect fencing, tree protection zones, site offices, amenities and plant/material storage areas) • provide temporary power supply to site compound • establish temporary facilities as required (e.g. temporary pedestrian access to station, construction lights, etc.) • erect hoarding around work areas where required • traffic control measures.
Power supply work (Grandview Street)	<ul style="list-style-type: none"> • isolate and remove high voltage (HV) feeder cables • decommission and remove existing pole top transformer, including redundant power poles • realign rail corridor boundary fence and relocate maintenance access gate • earthworks for new underground feeder cables, Underground to Overhead (UGOH) poles and padmount substation • install new UGOH poles and feeder cables • install new padmount substation and connect to UGOH poles.

Stage	Activities
Stairs and footbridge work	<ul style="list-style-type: none"> demolish existing railings and other existing footbridge components to accommodate lifts, where required stair modifications including new nosings, handrails and tactiles to meet DSAPT standards modifications to the Pacific Highway station entrance including the installation of new stairs and a canopy install new forecourt area from the Pacific Highway station entrance to the lift including new TGSIs and handrails where required regrade / resurface bitumen on stair landing surfaces at footbridge, where applicable.
Lift work (Grandview Street lift and station platform lift)	<ul style="list-style-type: none"> demolish existing vacant kiosk on the bridge (station platform lift only) widen and regrade/resurface the existing footpath (kerb modifications, line marking, etc.) at Grandview Street to accommodate new lift excavation for lift pits and foundations including piling work waterproofing (as required), installation of reinforcement, formwork and concrete to form the lift pit preassemble and erect lift structures inclusive of cantilevered upper landing, glazing, louvres, roof, motor, air conditioning, and other auxiliary equipment install canopies and anti-throw screens (where applicable) at lift landings to match existing install lift cars architectural fit-out around lift shaft including new awning over the lift.
Lift work and car park upgrades (Pacific Highway lift)	<ul style="list-style-type: none"> realign retaining wall where required realign rail corridor boundary fence and relocate maintenance access gate relocate bin enclosure as required excavation for lift pits and foundations including piling work waterproofing (as required), installation of reinforcement, formwork and concrete to form the lift pit preassemble and erect lift structures inclusive of cantilevered upper landing, glazing, louvres, roof, motor, air conditioning, and other auxiliary equipment install canopies and anti-throw screens (where applicable) at lift landings to match existing install lift car architectural fit-out around lift shaft including new awning over the lift localised regrading/resurfacing of car park to install new accessible car park spaces and new accessible kiss and ride, including line marking and bollards.
Station building modifications	<ul style="list-style-type: none"> remove the existing internal walls and fittings of the existing male / female toilet facilities for the new family accessible toilet and unisex ambulant toilet adjustments to the doorways and access provisions including the requirement to lower the floors to provide level access and the provision of remote access control install new fittings, fixtures, finishes, services connections upgrades to the station distribution boards including adjustments to circuit breakers upgrades to general station infrastructure including wayfinding signage and CCTV where required.

Stage	Activities
Platform modification work	<ul style="list-style-type: none"> platform regrading/resurfacing work as required for accessible path and combined services route installation of new tactiles modifications to platform furniture, including boarding ramps and lighting where required install new canopy extension from platform lift to station building and boarding assistance zone modifications to drinking fountain and payphone as required install new Opal Card reader near platform lift.
Demobilisation	<ul style="list-style-type: none"> installation of ancillary features and landscaping remove hoardings and site compound commission lifts and padmount substation clear the site of construction materials and equipment.

3.4.2 Plant and equipment

The plant and equipment likely to be used during construction includes:

- trucks (semi-trailer)
- jack hammer
- chainsaw
- piling and drill rig
- franna/mobile cranes
- bobcat
- excavators
- demolition saw
- concrete pump (line and boom) and truck
- lighting tower
- diesel generator
- coring machine
- water cart
- rail mounted elevated work platform
- suction trucks
- forklift
- hi-rail plant (EWP/flatbed/hiab/ball on tyred dumpy)
- vibrating roller/compaction plate
- road rail excavator
- hand tools
- skip trucks
- hammer drills
- torque wrenches
- impact wrenches
- grinders and bar benders
- elevated work platform (EWP).

3.4.3 Working hours

The majority of work 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 work may need to occur outside standard hours and would include night work and work during routine rail shutdowns which are scheduled closures that would occur regardless of the Proposal when part of the rail network is temporarily closed for ongoing maintenance and trains are not operating.

Out of hours work is required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers and to ensure the safety of railway workers and operational assets. Approximately six rail shutdowns would be required to facilitate:

- services relocation
- site establishment and demolition work
- installation of construction hoardings
- electrical, power supply and communication upgrades
- excavation, piling, forming and concrete pouring of lift pits / foundations
- installation of lift structures
- demolition of the existing kiosk on the footbridge and the installation of the new landing
- platform regrading / resurfacing and platform excavations for services
- modifications to the station building.

Out of hours work may also be scheduled outside rail shutdown periods. Approval from Transport for NSW would be required for any out of hours work and the affected community would be notified as outlined in Transport for NSW's *Construction Noise and Vibration Strategy* (TfNSW, 2019h) (refer to Section 6.3 for further details).

3.4.4 Earthworks

Excavations and earthworks would generally be required for the following:

- construction of the lift shafts as a result of open cut excavations
- demolition of the stairs and construction of new forecourt area at the Pacific Highway station entrance
- localised regrading / resurfacing of the footbridge
- footpath modifications at Grandview Street
- localised platform regrading/resurfacing work
- localised regrading of the car park at Pacific Highway
- other minor civil work including footings and foundations for structures, drainage / stormwater work, and trenching activities for service adjustments and relocations.

It is estimated that approximately 150 - 250 cubic metres of excavated material would be generated from the above activities. Excavated material would be reused onsite where possible or disposed of in accordance with relevant legislative requirements.

3.4.5 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 ISCA Infrastructure Sustainability Rating Scheme (v1.2). Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.4.6 Traffic access and vehicle movements

Traffic and transport impacts associated with the Proposal are assessed in Section 6.1 of this REF. The potential traffic and access impacts expected during the construction of the Proposal include:

- increased construction vehicle traffic including light and heavy vehicles around the station
- changes to pedestrian movements due to the construction zones and barriers along Grandview Street and the Pacific Highway
- temporary loss of approximately ten parking spaces in the car park at the Pacific Highway station entrance to allow for an ancillary facility
- temporary loss of approximately three taxi spaces for large construction vehicle parking
- potential confusion and loss of amenity to customers accessing the station via temporary and changed facilities during construction
- short-term occupation of kerbside space by cranes facilitating construction
- minor travel delays on account of likely Traffic Control Plan (TCP) implementation requiring some users to stop for construction traffic.

3.4.7 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 within the Pacific Highway car park. The area nominated for the compound is on land owned by the NSW Transport Asset Holding Entity. Impacts associated with utilising this area have been considered in the environmental impact assessment including requirements for rehabilitation. A cleared area within the rail corridor approximately 350 metres east of the station would be utilised for construction lay down, with gated access off Grandview Street (refer to Figure 11).

3.4.8 Public utility adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required. It is likely some services may require relocation, including the overhead wiring on Grandview Street, but such relocation is unlikely to occur outside of the footprint of the work assessed in this REF. If work is required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

3.5 Property acquisition

Transport for NSW does not propose to acquire any property as part of the Proposal.

3.6 Operation and maintenance

The future operation and maintenance of the new station is subject to further discussion with Sydney Trains, Transport for NSW and Ku-ring-gai Council. Structures constructed under this Proposal would be maintained by Sydney Trains. However, it is expected that the footpath upgrades on Grandview Street and Pacific Highway, the road pavement, kerbing, and on-road markings on Grandview Street, as well as adjacent landscape areas would continue to be maintained by Ku-ring-gai Council.



Figure 11 Location of proposed temporary compound and laydown areas (indicative only, subject to detailed design)

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, 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 A.

As the Proposal would not or is not likely to have a significant impact on any matters of NES or on Commonwealth land, a referral to the Commonwealth Minister for the Environment is not required.

4.1.2 Other Commonwealth legislation

Other Commonwealth legislation applicable to the Proposal is discussed in Table 4-1.

Table 4-1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i>	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. The Proposal does not include any previously identified Aboriginal sites and/or places (refer Section 6.5); however, considerations for unexpected finds further detailed in mitigation measures and applies to this Act.
<i>Disability Discrimination Act 1992 (DDA)</i>	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of Pymble Station which is consistent with the objectives of this Act.

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

The *Transport Administration Act 1988* establishes Transport for NSW as a public authority who is to exercise its functions in a manner that promotes certain common objectives, including to promote the delivery of transport services in an environmentally sustainable manner.

This REF has been prepared having regard to, among other things, the specific objectives of Transport for NSW under the *Transport Administration Act 1988*, including:

2A Objects of Act...

- a) to provide an efficient and accountable framework for the governance of the delivery of transport services,

- b) *to promote the integration of the transport system,*
- c) *to enable effective planning and delivery of transport infrastructure and services,*
- d) *to facilitate the mobilisation and prioritisation of key resources across the transport sector,*
- e) *to co-ordinate the activities of those engaged in the delivery of transport services,*
- f) *to maintain independent regulatory arrangements for securing the safety of transport services.*

2B Common objectives and service delivery priorities of public transport agencies...

(a) **Environmental sustainability**

To promote the delivery of transport services in an environmentally sustainable manner.

(b) **Social benefits**

To contribute to the delivery of social benefits for customers, including greater inclusiveness, accessibility and quality of life.

4.2.2 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 Division 5.1 of the EP&A Act. Division 5.1 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as Transport for NSW, which do not require development consent under Part 4 of the Act.

In accordance with section 5.5 of the EP&A Act, Transport for NSW, 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.

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 Division 5.1 of the EP&A Act has or is likely to have a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

4.2.3 Other NSW legislation and regulations

Table 4-2 provides a list of other relevant legislation applicable to the Proposal.

Table 4-2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
<i>Biodiversity Conservation Act 2016</i> (BC Act) (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>Biosecurity Act 2015</i> (NSW)	Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the Ku-ring-gai LGA are identified (refer to Section 6.7).

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 the Environment, Energy and Science Group, Department of Planning, Industry and Environment (DPIE) and potentially investigate and remediate land if contamination is above NSW Environment Protection Authority (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 work on any Crown land.
<i>Disability Discrimination Act 1992</i> (DDA Act) (Cwlth)	The Proposal would be designed having regard to the requirements of this Act.
<i>Heritage Act 1977</i> (Heritage Act) (NSW)	<ul style="list-style-type: none"> Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted Sections 139 and 140 (permit) where relics are likely to be exposed Section 170 where items listed on a government agency Heritage and Conservation Register are to be impacted. <p>Pymble Station is listed on the RailCorp Section 170 Heritage and Conservation Register. A discussion of potential impacts to local heritage is provided in section 6.5.</p>
<i>National Parks and Wildlife Act 1974</i> (NPW Act) (NSW)	<p>Sections 86, 87 and 90 of the NPW Act require approval from the Environment, Energy and Science Group, DPIE for any work which may impact an item of Aboriginal Heritage. 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 work would cease, and appropriate advice sought as per the <i>TfNSW Unexpected Heritage Finds Guideline</i> (TfNSW, 2019b).</p>
<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 5.7 of the PoEO Act, Transport for NSW 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 Construction Contractor.
<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 work on unclassified roads.</p> <p>The Proposal would involve work on Grandview Street which is a local road under the control of Ku-ring-gai Council.</p> <p>Road Occupancy Licence/s would be obtained from the relevant roads authority for road works and any temporary road closures where required (see Section 6.1 for more information).</p>
<i>Sydney Water Act 1994</i> (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
<i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act) (NSW)	Transport for NSW 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 (from a natural source e.g. aquifer, river – only from the network), water management work, drainage or flood work, controlled activities or aquifer interference.

4.2.4 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

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

Division 15, Clause 79 of the Infrastructure SEPP allows for certain types of development to be carried out by or on behalf of a public authority without consent on any land (i.e. assessable under Division 5.1 of the EP&A Act). Specifically, Clause 79(1) of the Infrastructure SEPP states that:

‘Development for the purpose of a railway or rail infrastructure facilities may be carried out 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’.

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 Division 5.1 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.

The Infrastructure SEPP prevails over all other environmental planning instruments except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018*. The Proposal does not require consideration under these SEPPs and therefore do not require further consideration as part of this REF.

State Environmental Planning Policy 55 – Remediation of Land

State Environmental Planning Policy No.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. While consent for the Proposal is not required, the provisions of SEPP 55 have still been considered in the preparation of this REF.

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

4.2.5 Ku-ring-gai Local Environmental Plan (Local Centres) 2012

The Proposal is located within the Ku-ring-gai LGA. The Infrastructure SEPP prevails over all other environmental planning instruments (such as LEPs), except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018*. Notwithstanding, the provisions of *Ku-ring-gai Local Environmental Plan (Local Centres) 2012* (Ku-ring-gai LEP) have been considered as part of the preparation of this REF Table 4-3).

Table 4-3 Relevant provisions of the Ku-ring-gai LEP

Provision description	Relevance to the Proposal
Clause 2.3 Zone Objectives and Land Use Table (Figure 12)	<p>Under the Ku-ring-gai LEP:</p> <ul style="list-style-type: none"> the rail corridor is zoned as SP2 Infrastructure – Classified Railway Pymble shopping village is zoned B2 Local Centre Pacific Highway is zoned SP2 Classified Road the Pacific Highway shops are zoned B5 Business Development east of the shopping village and south of the Pacific Highway is zoned R4 High Density Residential surrounding residential areas are zoned R2 Low Density Residential Robert Pymble Park to the northeast and Cresswell O'Reilly Lookout to the southeast is zoned RE1 Public Recreation. <p>The Proposal is consistent with the objectives of these zones.</p>
Clause 5.10 Heritage conservation	<p>Clause 5.10 of the Ku-ring-gai LEP aims to conserve the heritage significance of heritage items, archaeological sites, Aboriginal objects and Aboriginal places within the LGA.</p> <p>There are a number of heritage items listed on the Ku-ring-gai LEP within 100 metres of the Proposal including:</p> <ul style="list-style-type: none"> Former Police Station Uniting Church Dwelling House Dwelling House "Claverton" Pymble Hotel Park Estate Conservation Area Athol Conservation Area. <p>A discussion of potential impacts to local heritage is discussed in Section 6.5.</p>
Clause 6.1 Earthworks	<p>Clause 6.1 of the Ku-ring-gai LEP aims to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.</p> <p>By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Consideration of the potential impacts and mitigation measures for earthworks for the Proposal is outlined in Section 6.8.</p>

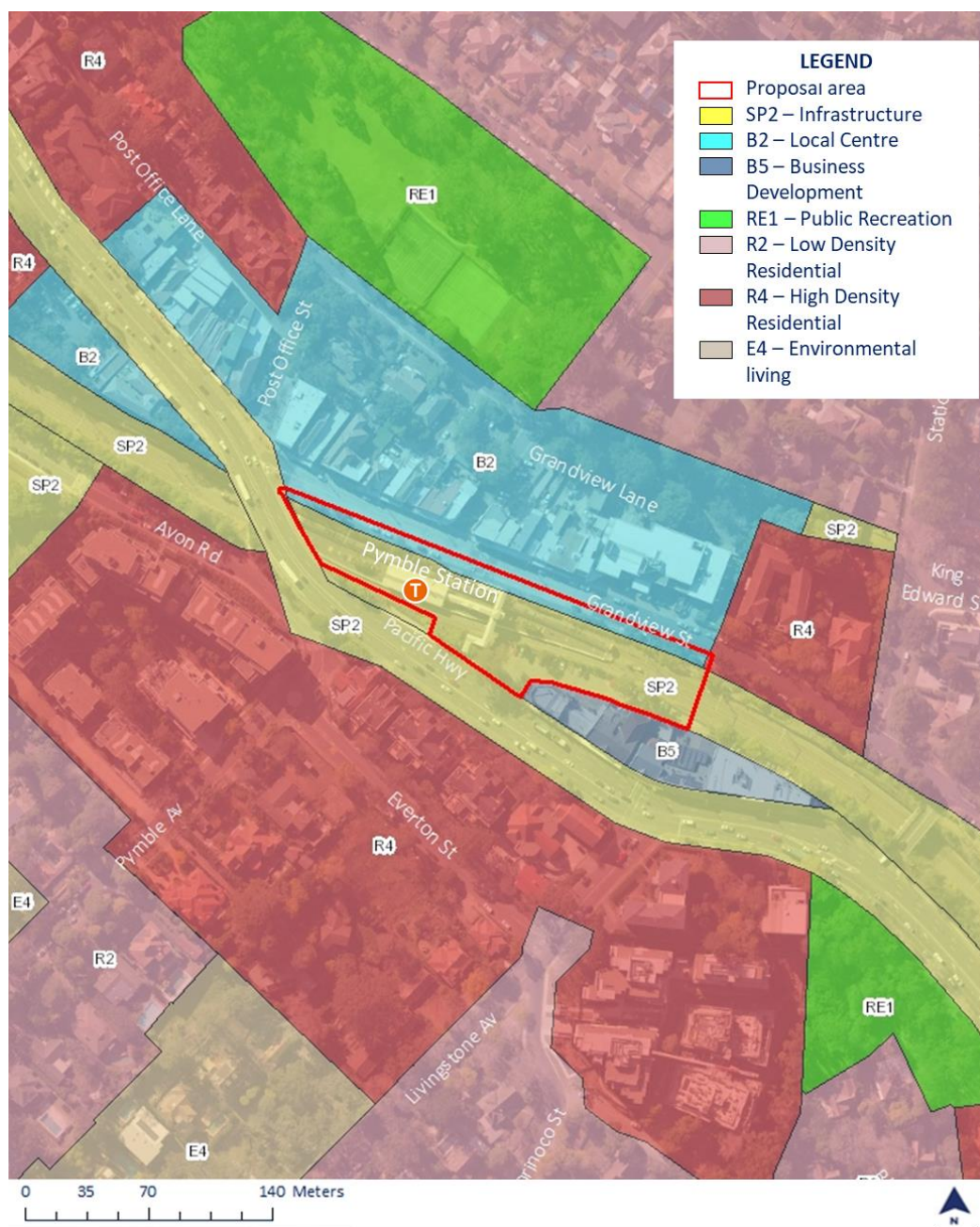


Figure 12 Ku-ring-gai LEP zoning map

4.3 Ecologically sustainable development

Transport for NSW 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 Transport for NSW throughout the development and assessment of the Pymble Station Upgrade. Section 3.3.3 summarises how ESD 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

Key stakeholders for Pymble Station, comprising of Sydney Trains and Transport for NSW, were engaged during development of the scoping design plan to provide insights into the scope of work for the Proposal, and to also participate in the development and assessment of the station improvement options.

Early engagement was undertaken between 23 September and 7 October 2020 to provide the community an opportunity to have their say on the early scoping designs. Transport for NSW advertised this early engagement period via:

- advertisements in the local paper
- notifications distributed to the suburb of Pymble
- signage installed at the station, with flyers made available to customers
- a dedicated project web page and social media updates with information on the project, and a web feedback form to collect feedback from the community.

Community sentiment was generally supportive of the proposed concept design. The project received 19 submissions during the scoping design engagement period. The feedback received from the community included:

- support for the Proposal
- requests to preserve the character of the station
- requests for additional lighting and CCTV to increase customer safety
- requests to reconsider finishes and scale of new lift shafts
- requests to consider additional commuter car parking.

This feedback was provided to the project team for consideration and to help inform the planning process and documentation.

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 5-1 provides details of consultation requirements under the Infrastructure SEPP for the Proposal.

Table 5-1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 Consultation with Councils – development with impacts on council related infrastructure and services	<p>Consultation is required where the Proposal would result in:</p> <ul style="list-style-type: none"> substantial impact on stormwater 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 includes work that would:</p> <ul style="list-style-type: none"> require connections or impacts the stormwater system temporarily disrupt pedestrian and vehicle movements impact on road pavements under Council's care and control impact on Council-operated footpaths. <p>Consultation with Ku-ring-gai Council has commenced and would continue throughout the detailed design and construction phases.</p>
Clause 14 Consultation with Councils – development with impacts on local heritage	<p>Where railway station work:</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>There is no proposed impact to local heritage items / heritage conservation areas listed under the Ku-ring-gai LEP. Accordingly, consultation with Ku-ring-gai Council under Clause 14 is not required. Refer to Section 6.5.</p>
Clause 15 Consultation with Councils – development with impacts on flood liable land	<p>Consultation is required where the Proposal would result in:</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 is susceptible to flooding. Accordingly, consultation with Ku-ring-gai Council under Clause 15 is not required. Refer to Section 6.9.</p>
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	<p>Consultation is required where the Proposal would result in:</p> <ul style="list-style-type: none"> impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land. 	<p>The Proposal is not within a coastal vulnerability area. Accordingly, consultation with Ku-ring-gai Council under Clause 15A is not required.</p>
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	<p>Where railway station work:</p> <ul style="list-style-type: none"> impact on flood liable land. <p>Written notice must be given (together with a scope of work) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.</p>	<p>The Proposal area has not been identified in the Ku-ring-gai LEP as having potential for flooding. Accordingly, consultation with State Emergency Service under Clause 15AA is not required.</p>
Clause 16 Consultation with public authorities other than Councils	<p>For specified development which includes development that is undertaken adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i>, consultation with the DPIE Energy, Environment and Science Group is required. Consultation with other agencies is required when specified by the Infrastructure SEPP.</p>	<p>The Proposal is not located adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i>. Accordingly, consultation with the DPIE Energy, Environment and Science Group under Clause 16 is not required.</p>

5.3 Consultation strategy

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 Public display

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

- installation of information signage at the station with QR codes taking customers to the project webpage
- public display of the REF on the project webpage
- distribution of a project update at the station, and to local community and rail customers, outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspapers with a link to the Transport for NSW website that includes a summary of the Proposal and information on how to provide feedback
- consultation with Ku-ring-gai Council, Sydney Trains, NSW Trains and other non-community stakeholders.

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 approximately two weeks. At the time the public display of the REF, consideration will be given to include face-to-face engagement in the form of a community information session at the station. A decision on whether to host an information session will be based on the latest COVID-19 health advice and the need for social distancing.

The REF would be available on the [TfNSW website](#)¹. Information on the Proposal would be available through the Project Infoline (1800 684 490) or by [email](#)².

Feedback can be sent to:

- projects@transport.nsw.gov.au

Or submitted:

- via the feedback box on the project webpage
<https://www.transport.nsw.gov.au/projects/current-projects/pymble-station-upgrade>
- via nsw.gov.au/improving-nsw/have-your-say/pymble-station-upgrade

Following consideration of feedback received during the public display period, Transport for NSW would determine whether to proceed with the Proposal and what conditions would be imposed on the project should it be determined to proceed.

5.5 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal (the area around Pymble Station) plus a 200 metre radius, on 2 September 2020, no known Aboriginal sites or places were identified. Therefore, no known Aboriginal sites would be impacted by the Proposal.

The extensive landscape modification that has occurred across the Proposal area suggests that intact evidence of Aboriginal land use is unlikely to occur within the boundaries of the Proposal area. Similarly, the high level of disturbance would suggest that the archaeological potential of the area is low. Therefore, it was not considered necessary to undertake specific Aboriginal consultation.

5.6 Ongoing consultation

At the conclusion of the public display period for this REF, Transport for NSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by Transport for NSW before determining whether to proceed with the Proposal (Figure 2).

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

Should Transport for NSW 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 Management Plan to be developed prior to the commencement of construction.

¹ <https://www.transport.nsw.gov.au/projects/current-projects/pymble-station-upgrade>

² projects@transport.nsw.gov.au

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 B.

6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment was prepared for the Proposal (SLR, 2020a). The assessment involved a site inspection undertaken on the 13 August 2020. The findings of the assessment are summarised in this section.

6.1.1 Existing environment

Pymble Station is on the T1 North Shore Line between Gordon Station and Turramurra Station. It provides rail connections between Central Station and Hornsby Station.

The station comprises an island platform, accessible via a set of stairs from the footbridge which connects Grandview Street to the Pacific Highway (Figure 13). This crossing is utilised by pedestrians accessing Pymble shopping village including shops on the Pacific Highway and Grandview Street, Pymble Ladies' College, and Pymble Station.

Pymble Station is currently not accessible as per the DDA and DSAPT, as elements of the station do not meet current standards.

Road network and Traffic

Pymble Station is located around 15 kilometres northwest of Central Station and is bound by Grandview Street to the north and Pacific Highway to the south. The road network is summarised in Table 6-1 and includes roads managed by Ku-ring-gai Council and Transport for NSW (refer also to Figure 13).

Table 6-1 Road network surrounding the Proposal area

Road	Classification	Posted speed limit	School zone	Configuration
Grandview Street	<ul style="list-style-type: none">Local Road managed by Ku-ring-gai Council	50km/h	No	Two unmarked lanes, undivided carriageway, a mixture of 1/2P and 1P parking restrictions. At the station entrance there is no parking restrictions in the weekday peak hours to allow kiss & ride activity and a taxi zone.
Pacific Highway	<ul style="list-style-type: none">State Road A1 managed by Transport for NSW	60km/h	No	5 marked lanes, divided carriageway, clearway restrictions apply 6am – 7pm Monday to Friday, 9am – 6pm Saturday, Sunday and Public Holidays

Parking

There is no accessible parking currently available at Pymble Station. There is similarly no dedicated commuter parking at Pymble Station, however Grandview Street between the railway overpass and Wellesley Road has approximately 40 informal on-street angle parking spaces which would be utilised by rail customers. Restricted on-street parking is also available on the surrounding road network within the Pymble shopping village.

There is a car park owned by the Transport Asset Holding Entity (TAHE) at the Pacific Highway station entrance to the southeast of Pymble Station in a laneway off the Pacific Highway. This car park provides approximately 10-12 short-term parking (1P and 2P) spaces, mostly utilised by customers of the commercial businesses on the Pacific Highway.

Taxis and kiss and ride

A dedicated taxi bay (with four spaces) is provided near the Station on Grandview Street (Figure 13). No formal kiss and ride area is currently provided at Pymble Station, however informal kiss and ride has been observed in the 'no parking' zones on Grandview Street and in the Pacific Highway station entrance car park.

Bus services

There are two bus stop locations in close proximity to Pymble Station, as follows:

- Grandview Street, opposite Pymble Station (only operational between 6:30am-9am and 3pm-7pm) (ID: 207332)
- Pymble Station, Pacific Highway (ID: 207311).

Table 6-2 summarises the public bus routes and school services that utilise these bus stops.

Table 6-2 Bus services at Pymble Station

ID	Service	Route	Frequency (Peak)	Frequency (Off-Peak)
Grandview St (207332)	579	Pymble to East Turramurra	15-20 minutes	-
Grandview St (207332)	579	East Turramurra to Pymble	Once per weekday	-
Grandview St (207332)	152 (school service)	Pymble Station to Brigidine College	Once per weekday	-
Grandview St (207332)	161 (school service)	Pymble Station to Sydney Japanese International School	Once per weekday	-
Grandview St (207332)	195S2 (school service)	Pymble Station to Brigidine College via St Ives Chase	Once per weekday	-
Grandview St (207332)	196S4	Pymble Station to Pittwater Place Shopping Centre via North Narrabeen	Once per weekday	-
Grandview St (207332)	196S5	Pymble Station to Pittwater Place Shopping Centre	Once per weekday	-
Grandview St (207332)	196S6	Pymble Station to Pittwater Place Shopping Centre	Once per weekday	-

ID	Service	Route	Frequency (Peak)	Frequency (Off-Peak)
Grandview St (207332)	8027	Pymble Station to St Ives High School	Once per weekday	-
Grandview St (207332)	8116 (school service)	Pymble Station to Northern Beaches Christian School	Once per weekday	-
Pacific Hwy (207311)	575	Macquarie University to Hornsby via Turramurra	20 minutes	30 minutes
Pacific Hwy (207311)	N90	City Town Hall to Hornsby via Chatswood	-	Four times a night
Pacific Hwy (207311)	N90	Hornsby to City Town Hall via Chatswood	-	Five times a night
Pacific Hwy (207311)	9039 (school service)	Pymble Public School to Pymble Station	Once per weekday	-
Pacific Hwy (207311)	9080 (school service)	Pymble Public School to Gordon Station	Once per weekday	-

Bike network and facilities

There are currently bicycle parking facilities provided at Pymble Station at both the Grandview Street station entrance and the Pacific Highway car park (with capacity for six bicycles at each location). Dedicated cycle infrastructure, such as bicycle lanes or separated paths, are limited in the vicinity of Pymble Station. However, Livingstone Avenue to the south and Telegraph Road to the northwest are identified as useful unmarked routes in the Ku-ring-gai Council cycle map.

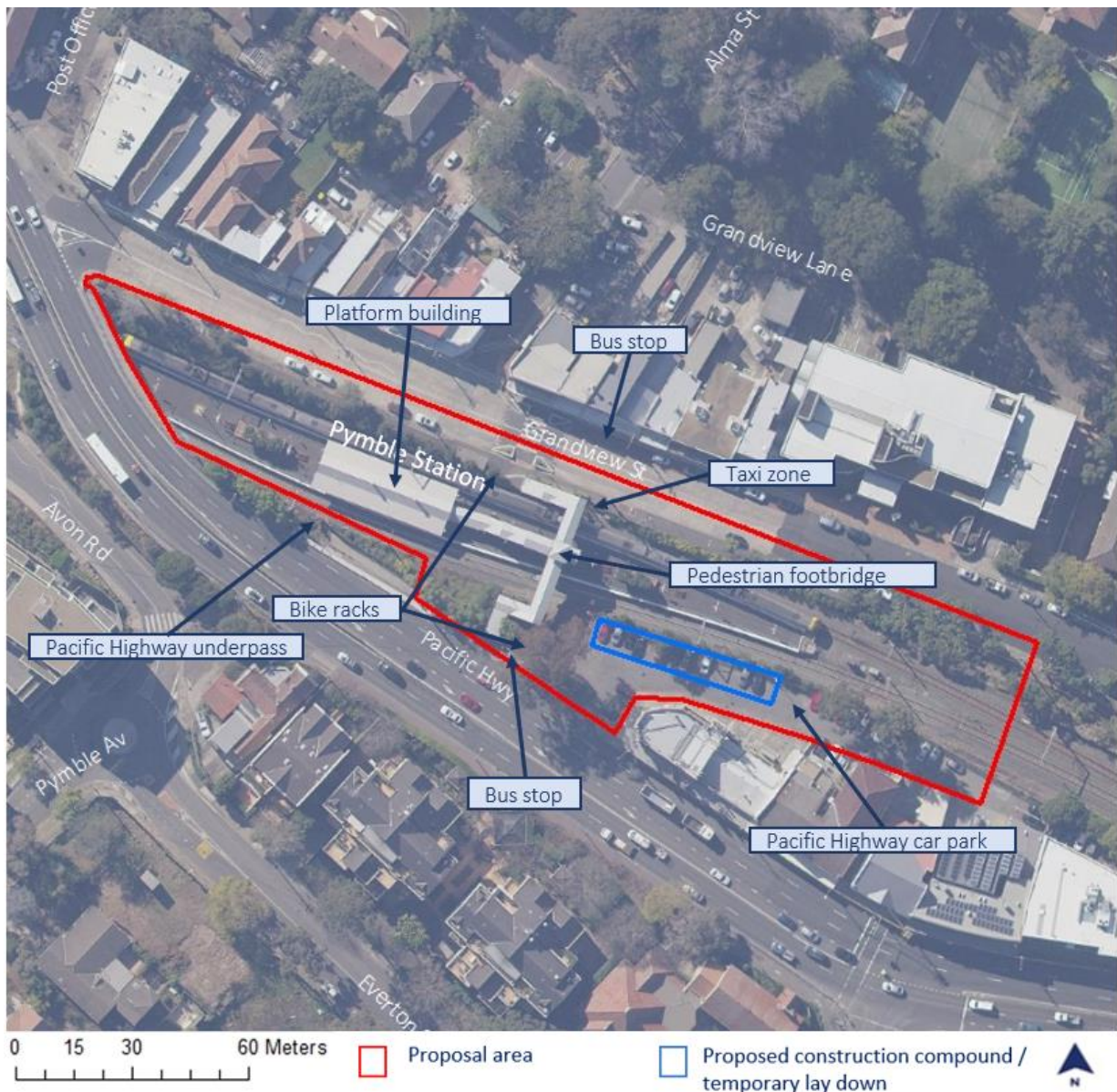


Figure 13 Key traffic and access features

6.1.2 Potential impacts

a) Construction phase

The Proposal would require a number of modifications to Pymble Station which require access to the pedestrian footbridge, the Pacific Highway car park, and along Grandview Street. The temporary lay down area within the rail corridor identified in Figure 11 would also be used during construction for the lay down of materials.

Customer and public access impacts

The following impacts to pedestrians/rail customers are anticipated from construction activities:

- a number of the construction activities require worksites in the construction compound within the Pacific Highway car park, and worksite areas on the station platform, in and around the existing footbridge, and in the road reserves for utility upgrades and interchange upgrades which pose additional safety risks

- potential higher levels of platform congestion arising from localised restrictions/narrowing of portions of the platform that may be temporarily fenced off to facilitate construction of the lift, platform canopy and internal station building modifications
- uneven surfaces and potential detours required during footpath upgrades and platform resurfacing
- potential loss of amenity and confusion due to temporary relocation of station accesses and facilities which may require a detour, particularly for upgrades to the footpath on Grandview Street and the modified station entrances / footbridge on both sides of the station
- higher road safety risk levels due to elevated frequency of pedestrian and truck interactions within the Pacific Highway car park and on Grandview Street.

Road network and traffic

Minor impacts on the road network and traffic are anticipated from construction activities. Approximately 25 light vehicles (including utility vans), as well as approximately 15 heavy vehicles for periodic delivery and removal of materials, and construction plant and equipment would be required during construction impacting the road network and local traffic. However, given the high volumes of traffic on Pacific Highway, this construction demand is unlikely to cause any major impact to traffic flow or operational performance.

Oversize vehicles may be required for prefabricated / precast elements such as lift shaft structure components, and steel beams, would require specific permits and advance route planning (i.e. identifying a suitable route with sufficient geometric capacity / turning circles for the vehicle).

A number of haulage routes for 19 metre long articulated vehicles to and from Pymble Station have been identified in Figure 14, which indicates construction vehicles could access Pymble Station from multiple directions including the Pacific Highway to the northwest and southeast, Mona Vale Road from the northeast and Ryde Road from the southwest.

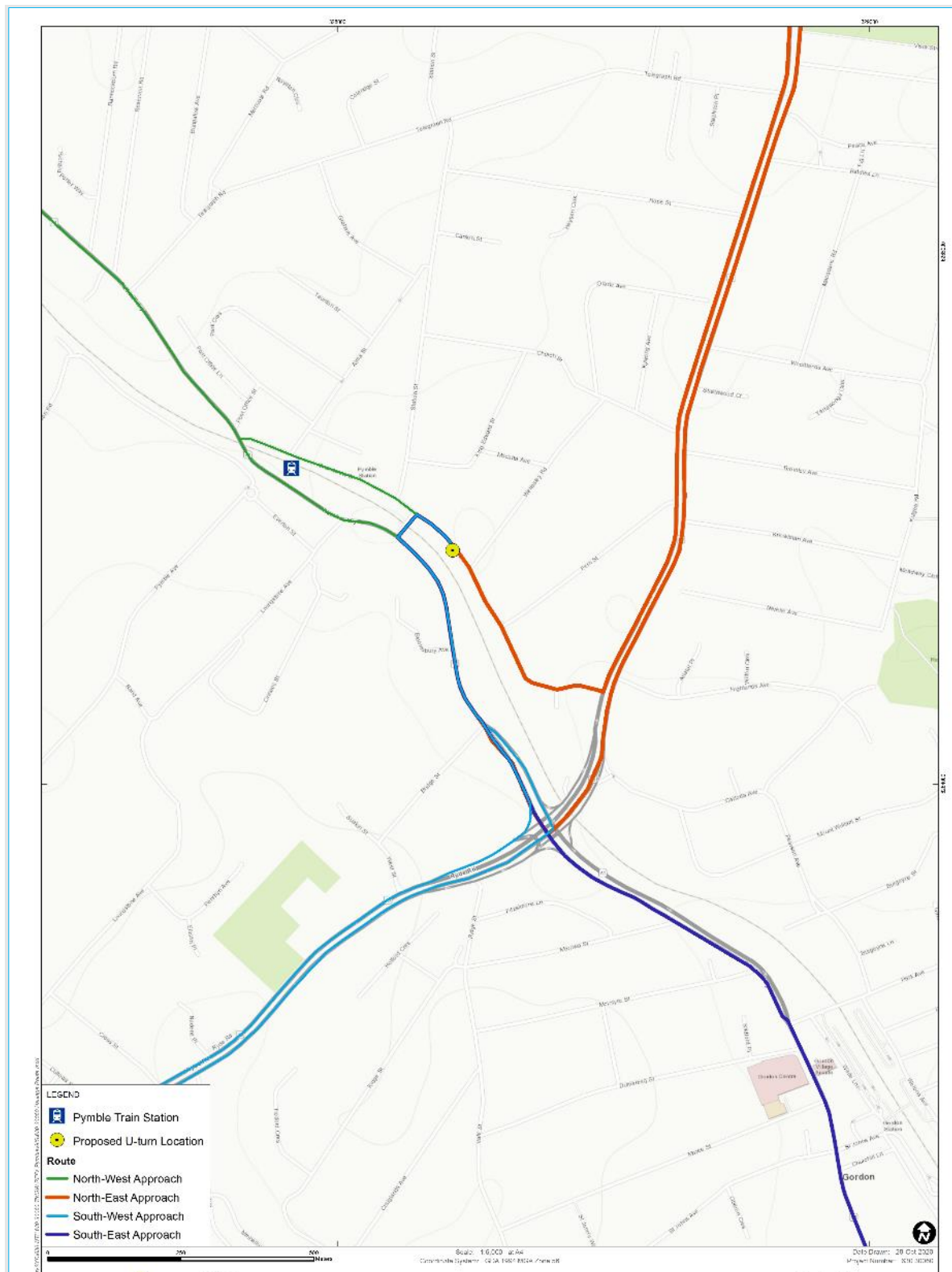


Figure 14 Proposed haulage routes for a 19 metre articulated vehicle (SLR, 2020a)

The Traffic, Transport and Access Impact Assessment indicates that semi-trailers (19 metre long vehicles and over) would require traffic management measures to enter and exit the Pacific Highway car park compound, which may temporarily impact on traffic along the Pacific Highway.

The preferred access to the construction lay down area within the rail corridor is via the Pacific Highway and then Grandview Street in the southbound direction. Entrance is then via an existing gated access. The Traffic, Transport and Access Impact Assessment indicates that forward entry and exit into the construction lay down area would not be possible for vehicles over 8.8 metres due to insufficient turning space within the rail corridor, and therefore may require traffic management measures.

An alternative to allow a typical three-point-turn manoeuvre for an heavy rigid vehicle (12.5 metres) could be facilitated by the installation of track access systems (hi-rail pads).

The Proposal may require the utilisation of hi-rail pads for deploying hi-rail vehicles on rail tracks during construction. Hi-rail pads installed on the rail track may be used at the following three locations:

- hi-rail access from Hornsby Street, Hornsby – existing hi-rail pads are available and therefore this location would be suitable for accessing the rail corridor
- hi-rail access from Grandview Street, Pymble – requiring the installation of hi-rail pads on the track at the temporary lay down area identified in Figure 11. The Traffic, Transport and Access Impact Assessment indicates that heavy rigid vehicles up to 12.5 metres long which would be able to enter and exit this track access point in the forward direction by performing safe turn-around manoeuvres within the laydown area. Given the requirement for traffic management at this location for utilisation of the lay down area, this is the preferred hi-rail vehicle access point

hi-rail access from Hill Street, Roseville – existing hi-rail pads are available and therefore this location would be suitable for accessing the rail corridor.

Traffic impacts arising from the Proposal during construction would be temporary and manageable subject to the preparation and implementation of a Construction Traffic Management Plan (CTMP) that would be prepared as part of a broader CEMP.

Parking

Construction workers may contribute to a minor increase in demand for local parking and would be required to park away from the station or within the nominated construction compound, and encouraged to car pool where practicable.

The construction compound is expected to result in the temporary closure of up to fourteen parking spaces in the car park off the Pacific Highway to the south of Pymble Station. This car park is leased by Ku-ring-gai Council and comprises a mixture of 2P and business parking.

Undergrounding of high-voltage lines is expected to result in the temporary closure of up to fifteen 1P parking spaces in Grandview Street during construction, to facilitate construction plant and materials.

Interchange facilities

There would be temporary changes as a result of construction traffic accessing the site, or work being undertaken for the relocation of the taxi bay for the widening of the Grandview Street station entrance. This may result in the relocation / changes to the operation of taxi services whilst work is being undertaken.

Public transport

Train services would be affected during rail shutdowns although these are not specific to this Proposal and would occur regardless for ongoing maintenance of the wider rail network.

The impact on public transport is anticipated to be minor, and involve:

- increased safety risk to pedestrians and rail / bus commuters near the proposed site compound access off the Pacific Highway
- the bus stop adjacent to the Pacific Highway station entrance may be relocated (by approximately 50 metres) on a temporary basis during construction to allow for the work on the footpath adjacent to the Pacific Highway station entrance
- temporary traffic management measures for work safety along Grandview Street and the Pacific Highway which may slightly increase travel times for bus services
- bus services may also be delayed due to the interaction with construction vehicles entering and exiting the site compound off the Pacific Highway.

Property access

Property access would be maintained during construction to minimise the impact to local residents and businesses.

b) Operational phase

The Proposal would result in an overall positive impact by contributing towards making public transport more accessible to the community.

Customer and public access impacts

A pedestrian assessment for the scoping design was undertaken to confirm that the Proposal would adequately cater for the projected increase in customers in terms of pedestrian flows.

To assess the pedestrian Level of Service (LoS), Fruin's Pedestrian Flow Rate criteria was adopted, which is the number of pedestrians that pass a point during a specific period of time for a given level of service, which is a qualitative measure of pedestrian comfort and crowding tolerance level. Fruin defined six levels of crowding for queuing areas, walkways and stairways which are expressed in terms of Levels of Service (LoS) and range from 'A' (best level) to 'F' (worst level). The target rating for Transport Access Program projects is a Level of Service 'C'.

It is assessed that the station would achieve LoS 'C' in the AM peak period as customers would arrive at all periods between train services. However, the station would achieve a LoS lower than 'C' in the PM peak period as customers would alight from arriving trains simultaneously. The capacity assessment was done at the narrowest point of the footbridge, which pedestrians must travel to access the station. It is worth noting that the Proposal does not propose to change the width, and therefore pedestrian capacity, of the footbridge in any way.

The new lifts would allow for an accessible path of travel to the station platform from Grandview Street, the Pacific Highway station entrance and the Pacific Highway car park, allowing people with reduced mobility, parents / carers with prams or customers with luggage to access the Sydney Trains network. Beyond station accessibility, enhancements to the station entrances and footbridge would also serve to improve the connection across the rail corridor, to the station, and improve user amenity.

The Proposal would retain the same number of bicycle parking spaces at the Grandview Street and Pacific Highway station entrances (12 spaces in total).

Road network and traffic

The Proposal would increase accessibility to Pymble Station and improve the customer experience and amenity, potentially leading to a minor increase in utilisation and patronage. This may be due to customers either travelling by train where they did not before, or by changing from another nearby station.

As a result, there may be a minor increase in traffic generation however, it is projected to be minor and would have a negligible impact on the surrounding road network or the amenity of local residents.

Parking and access

The Proposal would provide two accessible parking spaces and one new accessible kiss and ride space with an accessible path of travel to the station platform via the new lifts from the Pacific Highway station entrance car park.

The widening of the footpath adjacent to the Grandview Street station entrance would reduce the kerbside parking capacity by up to three taxi zone spaces on Grandview Street during construction. However, the permanent relocation of the taxi zone further south along Grandview Street may result in the loss of up to three 1P parking spaces. It is expected that the impacts of removing these spaces would be minimal.

A minor indirect change to parking, i.e. an increase in parking demand, may result from increased station patronage.

The Proposal is not expected to have any impact on existing property access within the vicinity of the station.

Interchange facilities

The taxi zone on Grandview Street may be relocated further south by approximately 20 metres to allow for the widening of the footpath adjacent to the Grandview Street station entrance, however this is subject to further assessment during detailed design. The Proposal also seeks to formalise and enhance the existing taxi facilities by improving line marking, signage and kerbs adjacent to the Grandview Street station entrance. The upgrade of the Grandview Street station entrance would improve safety and amenity for motorists and loading / unloading passengers.

The accessibility enhancements at the station would improve the pedestrian movements between transport modes, including improved accessibility to the bus services at the Pacific Highway station entrance.

6.1.3 Mitigation measures

A CTMP would be prepared by the Construction Contractor in consultation with Transport for NSW and provided to Ku-ring-gai Council. The CTMP would be the primary tool to manage potential traffic and pedestrian impacts associated with each phase of construction. The CTMP, at a minimum, would include:

- procedures for preparing and implementing Traffic Control Plans (TCPs) which would provide details for signage and timing of any detours and traffic controls to manage temporary road disruptions such as modifications to the taxi zone on Grandview Street and the delivery of large plant and materials
- identification of final construction traffic access routes, ancillary facilities, contractor parking and loading zones
- nomination of access routes to and from the local road network and contractor parking
- scheduling of work / deliveries to avoid peak times and limiting of work in the road carriageway as much as practicable to limit traffic and parking impacts and maintain customer access to the station
- measures to:

- limit temporary parking losses
- maintain pedestrian cross corridor access and customer access to the station through traffic and pedestrian diversions
- maintain private property access unless otherwise agreed
- identify changed traffic / pedestrian conditions including details of construction signage including signposts and variable message signs, traffic controllers and other community notifications.

The following mitigation measures would also be implemented:

- consultation with the NSW Taxi Council and bus services would be undertaken to discuss impacts and consider alternate arrangements during construction
- The CTMP should consider the suggested haulage routes and swept path assessments for accessing the construction compound and laydown areas as identified in the Traffic Transport and Access Impact Assessment (SLR, 2020a).

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.2 Urban design, landscape and visual amenity

A Landscape Character and Visual Impact Assessment was undertaken by RPS for the Proposal (RPS, 2020a). The assessment included desktop analysis, site inspection and creation of artist's impressions. The artist's impressions provide an indication of what the Proposal may look like from key representative viewpoints once complete, in particular to demonstrate the bulk and scale, noting that materials and finishes are indicative and would be further investigated during detailed design.

The Landscape Character and Visual Impact Assessment was prepared in accordance with the *Beyond the Pavement* (NSW Roads and Maritime Services, 2014) and the *Guideline for Landscape character and visual impact Environmental Impact Assessment Practice Note assessment EIA-N04* (NSW Roads and Maritime Service, 2018). The sensitivity and magnitude of the landscape and visual impact was assessed to produce a combined impact rating of negligible, low, moderate and high (refer to Figure 15).

		Magnitude			
Sensitivity		High	Moderate	Low	Negligible
	High	High Impact	High-Moderate	Moderate	Negligible
	Moderate	High- Moderate	Moderate	Moderate-Low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Figure 15 Landscape character and visual impact rating matrix (NSW Roads and Maritime Services, 2018)

6.2.1 Existing environment

Seven landscape character zones (LCZs) have been identified for the Proposal, as shown in Figure 16 and described in Table 6-3. A LCZ is defined as the collective qualities including the built form, natural elements, and the cultural and social facets that combine to provide a locale with a unique sense of place.

Table 6-3 Local character zones surrounding the Proposal area

LCZ	Description
LCZ 1	LCZ 1 comprises Pymble shopping village which is located along Grandview Street and the Pacific Highway. The landscape character in this zone is heavily urbanised/modified with only contrived landscape elements throughout the zone. The shopping precinct on Grandview Street has a landscape character of wide sidewalks on both sides of the road, on-street car parking and shopfront awnings extending to the road frontage. Shops consist of boutique retail outlets, professional suites, and on street eating/cafes and other services.
LCZ 2	LCZ 2 comprises Pymble Station and the rail corridor. The station infrastructure is bound by Pacific Highway to the south and Grandview Street to the north. This LCZ is typified by the railway infrastructure on the ground and overhead. The track is two lines and the station is an island platform configuration. Vegetation lines each side of the corridor, however the landscape character in this zone is heavily industrialised/modified with only contrived landscape elements.
LCZ 3	LCZ 3 comprises the residential areas located in nearby streets, predominantly characterised by single detached dwellings. The streetscape character of the LCZ 3 is characterised by narrow tree lined streets with street parking. Landscape character includes well vegetated street verges with front gardens full of formal planting arrangements. The landscape character in this zone is highly urbanised/modified with no evidence of the original landscape or its components.
LCZ 4	LCZ 4 comprises mid story residential buildings located mainly around the Pacific Highway, typified by brick finished buildings built between 1950s and before the 2000s. Mature vegetation is evident in the streetscapes and lots within this LCZ. Front gardens are fenced/retained in many situations with formal hedges fronting many of the streetscapes. The landscape character in this zone is highly urbanised/modified with no evidence of the original landscape or its components.
LCZ 5	LCZ 5 is predominately located to the south of Pymble Station, with one unit complex located on Telegraph Road to the north. The landscape character zone is predominantly modern architecture design. Dwellings are typically three to five storeys featuring glazing, and juxtaposition between the masonry and building features. Wide streets are lined with large exotic trees and dense vegetation within the residential open spaces. The landscape character is highly urbanised/modified, with very modern landscape and built elements, and no evidence of the original landscape of the area.
LCZ 6	LCZ 6 is predominately recreational area within the suburb of Pymble. Established vegetation (both native and exotic) dominate the landscape in and around the park. The park features multiple tennis courts, a playground, and lawns, with dense landscaping around all road frontages. Pathways intersect the eastern end of the park and seating is provided at vantage points around the park. The landscape character is highly contrived with little evidence of the pre-modern landscape character. Elements of landscape value include the open grass lawns and the established vegetation.
LCZ 7	LCZ 7 comprises Pymble Uniting Church, the former police station, and Pymble Ladies' College. The landscape character of these sites is typified by detached dwellings of federation and inter-war architecture, with the church and the former police station having local heritage significance. The landscape elements are highly contrived with vegetation being mainly exotic. The landscape is heavily formalised and extensively maintained. The value in this landscape character is in the distinctive architectural types of buildings/landscape.

Visual receivers / viewpoints

Visual receivers are individuals and / or groups of people whose views may be affected by the Proposal. These include users of residential dwellings, commercial properties and open space and generally comprise residents, rail customers, motorists and pedestrians.

Eleven locations have been identified to represent key viewpoints to and from the Proposal:

- Viewpoint 1: View from Grandview Street to the west of the station

- Viewpoint 2: View from Grandview Street east of the station
- Viewpoint 3: View from the footbridge
- Viewpoint 4: View from the Pacific Highway car park
- Viewpoint 5: View from the Pacific Highway – northbound (opposite the shops)
- Viewpoint 6: View from Pymble Uniting Church
- Viewpoint 7: View from Pacific Highway – north of the station
- Viewpoint 8: View from Pacific Highway – north of the station
- Viewpoint 9: View from Pymble Avenue
- Viewpoint 10: View from Alma Street
- Viewpoint 11: View from the railway overpass - south of the station
- Viewpoint 12: View from Grandview Street - east of the station.

As part of the Visual Impact Assessment, an assessment was undertaken to understand the potential impacts on views as a result of the Proposal at these locations. These locations are shown in Figure 16.

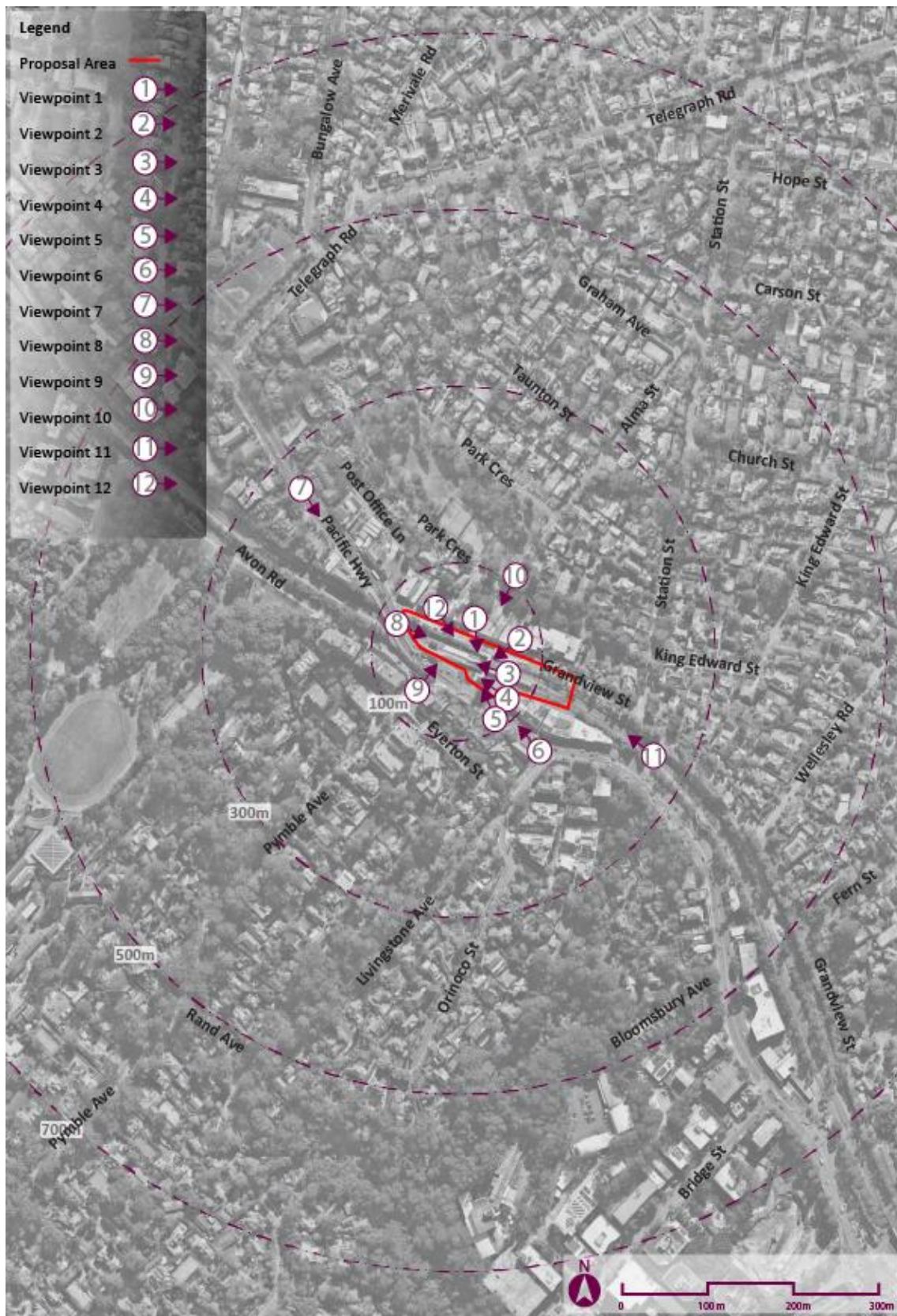


Figure 16 Viewpoints surrounding the Proposal area

6.2.2 Potential impacts

a) Construction phase

Construction activities would generally be more visible than the operational stage of the Proposal. The construction activities would be transient in nature. Temporary elements likely to be introduced into the visual environment include:

- fencing and hoarding
- road barriers and signage
- ground disturbance
- formwork and scaffolding
- cranes and other construction equipment
- site office and amenities including the storage of materials and equipment.

Although temporary, construction would be a prominent feature of the scene and contrast the surrounding scale and character of the station. This would temporarily impact the views from passengers, motorists, and residential dwellings as the most sensitive receptors.

To facilitate the upgrades to the footbridge and the Pacific Highway car park, up to three trees in close proximity may need to be removed to enable the operation of construction machinery adjacent to the bridge, and for ground disturbing work required. These are identified as Trees 28, 29 and 30. Due to the size of the Wallangarra White Gum (*Eucalyptus scoparia*) (Tree 29) being approximately 22 metres, there would be an adverse visual impact if this were to be removed. The Arboricultural Impact Assessment undertaken for the Proposal however indicated this tree has a limited life expectancy due to apparent failure on multiple leaders (stems) and shows active decay.

To facilitate upgrades to the utilities to support the installation of the new lifts, Trees 1-13 in Figure 32 may require removal due to the under boring beneath the root zones. Under boring or excavation methods that are sympathetic toward root retention may however allow for tree retention and protection and would be further explored during detailed design. The visual impacts associated with the potential removal of these trees is assessed further in the operational impacts section below.

Where night work is required for the Proposal this would involve the use of temporary lighting for operational, safety and security purposes. Lighting installations would be placed to avoid light spill to adjoining road corridors and residential areas.

All viewpoints have low sensitivity to change due to the urbanised / contrived environment with low scenic value, predominately dominated by rail and road infrastructure. The magnitude of change on the landscape during construction is assessed as low given the scale of new elements such as construction plant, equipment and ancillary facilities that are not a significant visual departure from the existing landscape character and are temporary in nature. The overall sensitivity and magnitude have been combined to generate an overall impact during construction, assessed as low. The impacts of the introduction, replacement and removal of permanent built elements at Pymble Station as a result of the Proposal have been further assessed below.

b) Operational phase

The Landscape Character and Visual Impact Assessment outlines how key design initiatives minimise visual impacts and impacts to the heritage listed station. For example:

- the lift shaft structures are steel type and the appearance of the base matches the station building (masonry)

- vegetation clearing has been minimised where possible and investigations into alternate construction methodologies would be undertaken during detailed design to reduce the requirement for removal where possible
- proposed new lighting will be confined to the new lift landings
- heights of the proposed lifts have been reduced to minimise visual impact and bulk
- the three lifts have been designed with symmetry to create a more visually appealing design
- the lift roof design matches the station building roof pitch to create symmetry.

Artist's impressions have been prepared from Viewpoint 2, 3 and 5 to provide an indication of what the Proposal may look like during operation and are included in Figure 17 to Figure 22.

An assessment of the visual sensitivity and magnitude of each viewpoint during the operational phase of the Proposal is provided in Table 6-4, utilising the impact grading system matrix previously discussed (Figure 15). In summary, the Proposal would result in Negligible to Low impacts for the selected viewpoints.

Lighting would be designed in accordance with the requirements of standards relevant to *AS 1158 Road Lighting*, *AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting* and *AS 1428 Design for Access and Mobility*, and as such operational lighting impacts (such as light spill) are expected to be negligible.



Figure 17 Viewpoint 2 - Grandview Street - existing view



Figure 18 Viewpoint 2 - Artists impression of the view from Grandview Street



Figure 19 Viewpoint 5 - Pacific Highway northbound - existing view



Figure 20 Viewpoint 5 - Artist's impression of the view from the Pacific Highway - northbound



Figure 21 Viewpoint 3 - Pymble Station footbridge - existing view



Figure 22 Viewpoint 3 - Artist's impression of the view from the Pymble Station footbridge

Table 6-4 Summary of visual impact assessment

Viewpoint (VP)	Summary	Overall impact (sensitivity x magnitude)
Viewpoint 1: View from Grandview Street to the west of the station	<ul style="list-style-type: none"> The new lifts, platform canopy, and widened footpath on Grandview Street, will be evident from this viewpoint. However, the Proposal is not a departure from the existing urban landscape character and the magnitude of change is low. The undergrounding of electrical structures, the retention of mature vegetation where possible, and the symmetrical design of the new lifts would mitigate the magnitude of change. 	Low
Viewpoint 2: View from Grandview Street east of the station	<ul style="list-style-type: none"> The new lifts, platform canopy and widened footpath on Grandview Street will be evident from this viewpoint. However, the Proposal is not a departure from the existing urban landscape character and the magnitude of change is low. The undergrounding of electrical structures, the retention of mature vegetation where possible, and the symmetrical design of the new lifts would mitigate the magnitude of change. 	Low
Viewpoint 3: View from the footbridge	<ul style="list-style-type: none"> The view is dominated by the platform, the platform building and railway infrastructure below, with the new canopy evident from this viewpoint. The scale of the Proposal is increased marginally with the addition of the platform canopy, however this is a minor visual departure. 	Low
Viewpoint 4: View from the Pacific Highway car park	<ul style="list-style-type: none"> The view is highly urbanised, with the view of the new lifts, modifications to the Pacific Highway car park and ancillary activities remaining consistent with the existing landscape character. The formalisation of the pedestrian access would obscure the view of the utilities, and the symmetrical design of the new lifts would mitigate the magnitude of change. 	Low
Viewpoint 5: View from Pacific Highway - northbound	<ul style="list-style-type: none"> The view is dominated by the traffic infrastructure and commercial infrastructure, with the large existing <i>Eucalyptus scoparia</i> slightly obscuring the view of the new lifts, Pacific Highway station entrance upgrades, modifications to the Pacific Highway car park and ancillary activities. Removal of this tree would reduce the amount of non-built elements in this view and without replacement with a suitably sized specimen tree would expose some of the new built elements from this viewpoint. The retention (or replacement) of mature vegetation where possible, and the symmetrical design of the new lifts would mitigate the magnitude of change. 	Low
Viewpoint 6: View from Pymble Uniting Church	<ul style="list-style-type: none"> The view is dominated by vegetation along the Pacific Highway, commercial properties, traffic infrastructure and telecommunications / power infrastructure. The visual receivers have distant and obscured views of the Proposal. 	Low

Viewpoint (VP)	Summary	Overall impact (sensitivity x magnitude)
Viewpoint 7: View from Pacific Highway – north of the station	<ul style="list-style-type: none"> Proposal changes cannot be viewed from this location due to the Pacific Highway, vegetation and existing building obscuring views. 	Negligible
Viewpoint 8: View from Pacific Highway bridge– north of the station	<ul style="list-style-type: none"> The view from the Pacific Highway bridge crossing the rail corridor is highly urbanised with fencing, as well as transport and existing railway infrastructure obscuring the view. 	Negligible
Viewpoint 9: View from Pymble Avenue	<ul style="list-style-type: none"> Proposal changes cannot be viewed from this location due to the Pacific Highway, vegetation and existing building obscuring views. 	Negligible
Viewpoint 10: View from Alma Street	<ul style="list-style-type: none"> Proposal changes cannot be viewed from this location due to the vegetation and existing buildings obscuring views. 	Negligible
Viewpoint 11: View from the railway overpass - south of the station.	<ul style="list-style-type: none"> The view from the railway overpass is urbanised with rail corridor vegetation, however fencing and existing railway infrastructure obscure the view of the Proposal. 	Low
Viewpoint 12: View from Grandview Street – east of the station	<ul style="list-style-type: none"> The view is highly urbanised with railway infrastructure, power infrastructure, fencing, buildings, car parking and contrived plantings and therefore has low sensitivity to change. The proposed station infrastructure is not a significant visual departure from the existing visual conditions. However the tree removal on Grandview street would have a minor impact on the visual amenity, which would be mitigated by the removal of overhead wiring from the view. 	Low

6.2.3 Mitigation measures

Mitigation measures would be reviewed where appropriate during detailed design development and construction planning to minimise the level of visual impact of the construction and operation phases of the Proposal.

The detailed design of the Proposal is to be undertaken with reference to the recommendations included in the Landscape Character and Visual Impact Assessment (RPS, 2020a). Key project-specific mitigation includes:

- implementation of the proposed materials and finishes included in the Urban Design and Public Domain Plan including the use of brick to match the existing station building and canopy extensions to match existing
- retention of mature trees and vegetation (where possible) to maintain screening to new and existing railway infrastructure
- implementation of landscape design proposed in the initial Urban Design and Public Domain Plan, which is to be updated in the detailed design phase.

Measures to mitigate visual impacts during construction would be included in a CEMP for the Proposal and would include measures such as minimising light spill during night work and screening of compounds.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.3 Noise and vibration

This section provides a summary of the Noise and Vibration Impact Assessment undertaken by SLR (2020b). The assessment included:

- establishing the existing background noise levels in the vicinity of Pymble Station
- establishing the construction noise management levels and vibration limits that would apply to the upgrade work
- predicting environmental noise and vibration levels at nearby residential and other sensitive receivers due to the upgrade work
- considering potential noise from the operation of the upgraded Pymble Station
- identifying mitigation measures to reduce and manage noise and vibration impacts from the upgrade work to comply with established construction noise management levels and vibration limits.

As operational noise levels are expected to remain mostly unchanged and the specific mechanical systems to be installed for the Proposal are not yet finalised, no quantitative modelling of operational noise impacts was undertaken.

6.3.1 Existing environment

Noise sensitive receivers

The area surrounding the station was divided into two noise catchment areas (NCA01 and NCA02) as shown in Figure 23.

NCA01, to the north of the rail corridor, is primarily characterised by a row of commercial facilities with residential receivers located to the east and beyond the shopping village to the north. The closest residential receivers are approximately 25 metres north of the platform.

NCA02, to the south of the rail corridor, is primarily characterised by a mixed block of commercial, medical and educational facilities located immediately south of the station. The closest residential receivers are approximately 20 metres south of the platform.

Background noise levels

Existing noise levels (prior to construction of the Proposal) are measured to understand existing ambient noise levels and their sources, which inform the assessment of potential noise impacts from the Proposal.

Rating Background Noise Levels (RBLs) are determined from measurement of LA90 noise levels (representing the noise level exceeded for 90 per cent of the monitoring period) in the absence of noise from the Proposal.

To determine the RBLs, unattended noise monitoring using a noise logger was undertaken from 27 August 2020 to 11 September 2020 at 55 Grandview Street, Pymble (L.01) and 1 Livingston Avenue, Pymble (L.02) (as shown in Figure 23). RBLs are reported as L_{A90} as shown in Table 6-5.

Table 6-5 Unattended noise monitoring results

Location	Address	Period ¹	Rating Background Level (L _{A90}) in dB	Ambient noise level (L _{Aeq}) in dB
L.01	55 Grandview Street	Day time	51	60
		Evening	48	58
		Night time	37	56

Location	Address	Period ¹	Rating Background Level (L _{A90}) in dB	Ambient noise level (L _{Aeq}) in dB
L.02	1 Livingstone Avenue	Day time	62	76
		Evening	59	74
		Night time	44	72

Note 1: Day is defined as 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays & Public Holidays. Evening is defined as 6.00pm to 10.00pm Monday to Sunday. Night time is defined as 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays & Public Holidays.



Figure 23 Noise catchment areas and noise monitoring locations

The results of continuous unattended noise monitoring at these locations show day time ambient noise levels at both locations were observed to be dominated by traffic movements along Pacific Highway. Train movements were clearly audible at L.01 and were audible during breaks in traffic at L.02.

Operator attended monitoring was also undertaken on 27 August 2020 for L0.1 and 2 September 2020 for L.02. Day time ambient noise levels were observed to be largely

controlled by traffic movements along adjacent roads (mainly the Pacific Highway) and rail traffic.

Construction noise criteria

The EPA's *Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change, 2009) is the principal guideline for the assessment and management of construction noise in NSW. The ICNG recommends standard hours of construction as:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sundays and public holidays: no work.

Noise management levels (NMLs) have been determined for receivers as per the procedures in the ICNG. The ICNG prescribes set noise management levels for non-residential receivers such as commercial, schools and places of worship. Noise management levels for residential receivers are calculated based on the rating background level (RBL) + 10 dB(A) (for day time periods) or the RBL + 5 dB(A) (for evening and night time periods).

In addition, a 'highly noise affected' level of 75 dB(A) for residential receivers represents the point above which the ICNG indicates there may be strong community reaction to noise. Where work exceeds the noise management levels, all reasonable and feasible measures (such as equipment selection and location, construction scheduling and respite periods) should be implemented to reduce noise levels as far as practicable.

The construction NMLs calculated for residential receivers are listed in Table 6-6. The NML for sensitive receivers nearby such as educational institutes and places of worship, is prescribed by the ICNG, and is an internal noise management level. The corresponding external noise level (which the assessments are based on) has therefore been determined on the assumption that a 10 dB(A) noise reduction from outside to inside is applicable. This is considered to be a typical assumption for a 'windows open' scenario.

Sleep disturbance noise goals have also been established for residential receivers. The sleep disturbance criteria for both NCA are a screening level RBL + 15 dB(A). Where construction work is planned to extend over more than two consecutive nights, the ICNG recommends that an assessment of sleep disturbance impacts should be completed.

For traffic noise, the criterion applied on public roads generated during the construction phase of a project is an increase in existing road traffic noise of no more than 2 dB(A).

Table 6-6 NMLs for construction

NCA	Receiver type	Standard construction (RBL+10dB)	Out of Hours (RBL+5dB) ¹			Sleep disturbance (RBL+15dB)
		Day time	Day time	Evening	Night	
NCA01	Residential	61	56	53	42	52
NCA02	Residential	72	67	64	49	59
All	Commercial	70	70	n/a	n/a	n/a
All	Childcare centre	50	50	n/a	n/a	n/a
All	Place of worship	55	55	55	n/a	n/a

NCA	Receiver type	Standard construction (RBL+10dB)	Out of Hours (RBL+5dB) ¹			Sleep disturbance (RBL+15dB)
		Day time	Day time	Evening	Night	
All	Educational	55	55	n/a	n/a	n/a
All	Medical centre	65	65	n/a	n/a	n/a
All	Hotel	55	55	55	55	n/a
All	Public building	55	55	n/a	n/a	n/a
All	Outdoor passive recreation	60	60	60	n/a	n/a
All	Outdoor Active recreation	65	65	65	n/a	n/a

Note 1: Out of Hours construction hours – Evening hours are 6pm to 10pm. Night time hours are 10pm to 7am Sunday to Saturday and 10pm Saturday to 8am Sunday

Construction vibration criteria

The effects of vibration in buildings can be divided into three main categories:

- those in which the occupants or users of the building are inconvenienced or possibly disturbed
- those where the building contents may be affected
- those in which the integrity of the building or the structure itself may be prejudiced.

Human comfort

The EPA's *Assessing Vibration: a technical guideline* (Department of Environment and Conservation, 2006) provides guideline values for continuous, transient and intermittent events that are based on a Vibration Dose Value (VDV) rather than a continuous vibration level. The VDV is dependent upon the level and duration of the short-term vibration event, as well as the number of events occurring during the day time or night time period.

The maximum criteria level is 0.4 m/s^{1.75} for residences during the day time and 0.26 m/s^{1.75} during the night time. For offices, educational facilities and places of worship (when in use) the maximum criteria is 0.8 m/s^{1.75}. For critical working areas (such as precision laboratories) the maximum criteria is 0.2 m/s^{1.75}.

Effects on building contents

People can perceive floor vibration at levels well below those likely to cause damage to building contents or affect the operation of typical equipment. For most receivers, the controlling vibration criterion would be the human comfort criterion, and it is therefore not normally required to set separate criteria in relation to the effect of construction vibration on most building contents.

Where appropriate, objectives for the satisfactory operation of critical instruments or manufacturing processes should be sourced from manufacturer's data and / or other published objectives.

Structural damage vibration

Structural damage vibration limits are based on Australian Standard AS 2187: *Part 2-2006 Explosives - Storage and Use - Part 2: Use of Explosives* and British Standard BS 7385 *Part 2-1993 Evaluation and measurement for vibration in buildings Part 2*. These standards provide frequency-dependent vibration limits related to cosmetic damage, noting that cosmetic damage is very minor in nature, is readily repairable and does not affect the structural integrity of the building.

The recommended vibration limits from BS 7385 for transient vibration for minimal risk of cosmetic damage to residential and industrial buildings is shown in Table 6-7.

Table 6-7 Transient vibration guide values for minimal risk of cosmetic damage (BS 7385)

Type of building	Peak particle velocity: 4 – 15 Hz	Peak particle velocity: 15 Hz and above
Reinforced or framed structures industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
Un-reinforced or framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Safe working distances

Safe working distances for items of vibration intensive equipment are provided in Table 6-8.

Table 6-8 Safe working distances from vibrating plant

Plant item	Rating/description	Safe working distance (Cosmetic damage)	Safe working distance (Human response)
Vibratory roller	< 50 kN (Typically 1-2t)	5 m	15 m to 20 m
	< 100 kN (Typically 2-4t)	6 m	20 m
	< 200 kN (Typically 4-6t)	12 m	40 m
	< 300 kN (Typically 7-13t)	15 m	100 m
	> 300 kN (Typically 13-18t)	20 m	100 m
	> 300 kN (Typically > 18t)	25 m	100 m
Small hydraulic hammer	300 kg - 5 to 12t excavator	2 m	7 m
Medium hydraulic hammer	900 kg - 12 to 18t excavator	7 m	23 m
Large hydraulic hammer	1600 kg - 18 to 34t excavator	22 m	73 m
Jackhammer	Hand held	1 m (nominal)	Avoid contact with structure
Bored piling	< 800 mm	2 m	n/a

Operational noise criteria

The *Noise Policy for Industry* (EPA, 2017) (NPI) has two broad objectives:

- control intrusive noise levels in the short-term

- maintain noise amenity levels for specific land uses over the medium to long-term.

The NPI sets out procedures for establishing the project intrusiveness $L_{Aeq(15\text{minute})}$ and project amenity $L_{Aeq(\text{period})}$ noise levels, where the lower (i.e. more stringent) is then adopted as the Project Trigger Noise Level (PTNL). Applicable PTNLs for all noise sensitive receiver areas surrounding the Proposal have been calculated and are shown in Table 6-9.

Table 6-9 Project Trigger Noise Levels - residential

NCA	Time of day	Intrusive ¹ (dBA)	Amenity ² (dBA)	Overall PTNL ³ (dBA)
NCA01	Day	56	53	53
	Evening	53	464	46
	Night	42	444	42
NCA02	Day	66	644	64
	Evening	64	624	62
	Night	48	604	48

Note 1: Project intrusive noise level is RBL + 5dB

Note 2: The recommended amenity noise levels have been reduced by 5 dB to give the project amenity noise levels due to other sources of industrial noise being present in the area

Note 3: Resulting PTNL is the lower of the project intrusive and project amenity noise levels

6.3.2 Potential impacts

a) Construction phase

Noise

To assess the potential impacts from the proposed work, the construction phases described in Section 3.4.1 were used to develop indicative construction scenarios comprising typical plant and equipment. The scenarios developed were:

- site establishment – including establishment of compound / work areas and vegetation removal
- power supply work – including relocation and installation of power infrastructure
- main work – including demolition activities, excavation, lift installation, station building modifications and platform work
- site demobilisation.

A 3D computer noise model was then used to predict the $L_{Aeq(15\text{minute})}$ and $L_{A1(1\text{minute})}$ noise levels for each of the NCAs resulting from the above scenarios. Predictions include the source noise levels of the anticipated equipment, the location of the nearest sensitive receivers, the number of plant items likely to be operating at any given time, the distance between the equipment and the receivers, and any shielding or reflections that the topography or buildings may provide.

Worst-case noise level predictions have been made based on worst case impacts for each work scenario when the work is located at the nearest position within the work area to each

receiver. The predictions are provided in the Noise and Vibration Impact Assessment (SLR, 2020b). The impacts are summarised in Table 6-10.

In practice, the noise levels would vary because plant would move around the worksites and would not all be operating concurrently. This means that noise levels are likely to be lower than the worst-case noise levels presented for notable periods of time during the work.

Vegetation removal and demolition activities are predicted to result in 'highly noise affected' receivers (i.e. noise levels above 75 decibels). Worst case construction day time noise levels are predicted above 75 dBA $L_{Aeq(15\text{minute})}$ to the closest receivers in both NCAs during the operation of noise intensive equipment (Figure 24).

Table 6-10 Summary of predicted noise impacts

Work scenario	Summary of predictions	Timing and duration of work
Site establishment	<ul style="list-style-type: none"> Day time exceedances of NMLs of up to 19 dB for residential receivers in NCA01 and up to 9 dB NCA02 during vegetation removal. Exceedance of the night time NMLs at residential receivers are predicted up to 26 dB for site establishment at the nearest residential receivers. Impacts at other sensitive receiver types are typically those receivers immediately adjacent to the work, with NML exceedances identified as relatively high. 	Standard day time hours and out of hours work (including rail shutdowns).
Power supply work	<ul style="list-style-type: none"> Day time exceedances of NMLs are negligible, however exceedances of night time NMLs up to 21 dB in NCA01 and 18 dB in NCA02 are predicted for the nearest residential receivers. The use of noise intensive equipment during the night time period increases the risk of sleep disturbance at the surrounding residential receivers, however it is recommended that use of noise intensive equipment is scheduled to occur during day-time periods 	Standard day time hours and out of hours work (including rail shutdowns).
Main work	<ul style="list-style-type: none"> Impacts during standard construction hours are predicted to be below NML at the majority of surrounding residential receivers. Day time exceedances of NMLs of up to 5 dB for the most potentially affected residential receivers during demolition, platform resurfacing and laydown activities are predicted. Exceedance of the night time NMLs at residential receivers are predicted up to 28 dB (demolition activity) and 24 dB (platform resurfacing and in-corridor laydown area) at the nearest residential receivers. The highest predicted noise levels at non-residential receivers exceed the NML by up to 13 dB. 	Standard day time hours and out of hours work (including rail shutdowns).
Site demobilisation	<ul style="list-style-type: none"> The nearest-affected residential receivers in NCA01 are predicted to exceed the day time NMLs by up to 7 dB. Exceedance of the night time NMLs at residential receivers are predicted up to 26 dB for site establishment at the nearest residential receivers The highest predicted noise levels at non-residential receivers exceed the NML by up to 26 dB at the nearest receivers. 	Standard day time hours and out of hours work (including rail shutdowns).

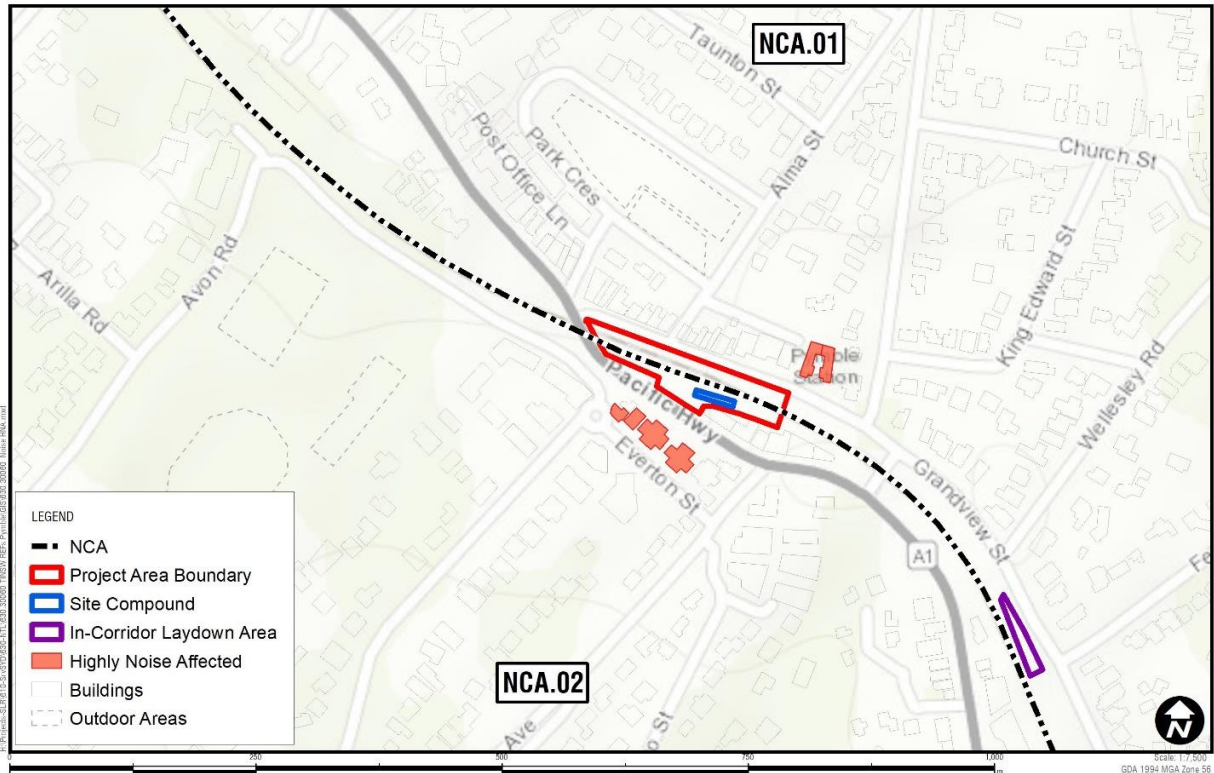


Figure 24 Highly affected noise receivers

Cumulative noise impacts

Cumulative noise impacts warrant assessment where more than one work scenario operates at the same time and in the same location such that the same receiver is impacted by noise from more than one work scenario. Generally, the proposed work is scheduled in consecutive phases which are dependent on rail shutdowns and therefore cumulative noise impacts are not anticipated as the assessment is controlled by noise impacts from the individual phases (as assessed).

Where construction work associated with other projects occurs at the same time as the Proposal, this has the potential to result in marginally higher noise levels at the nearby receivers. However, noisy work from each project would typically not occur at the same time, and may affect different facades of a building, minimising the cumulative impacts.

Construction traffic noise

The proposed construction activities would not generate a significant amount of construction traffic. The relatively small number of construction vehicles accessing the site is predicted to have an insignificant impact on existing road traffic noise levels. Further consideration of noise impacts due to construction traffic is not required.

Vibration

Vibration intensive equipment is proposed during the service relocation work scenarios which include the use of jackhammers and bored piling.

Piling work is associated with several work activities. It is assumed that piling work would be performed using non-vibration intensive bored piling. If the Contractor elects to use an alternative piling method, the vibration levels generated by this plant may be higher and would require further assessment.

Human comfort

In relation to human comfort (response), the safe working distances in Table 6-8 relate to continuous vibration and apply to residential receivers. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods are permitted, as discussed in *Assessing Vibration - a technical guideline* (Department of Environment and Conservation, 2006).

Cosmetic damage assessment

Indicative vibration levels at nearby receivers are shown in Table 6-11.

Table 6-11 Indicative vibration levels at receivers

Receiver	Approximate distance to work area	Indicative vibration level (mm/s) ¹
NCA01 (commercial)	15 metres	7.5
NCA02 (commercial)	15 metres	7.5
NCA02 (residential)	40 metres	1.6

Note 1: Estimated from the safe working distances specified in TfNSW Construction Noise and Vibration Strategy and assumed dense rock.

Heritage building impacts

Heritage structures identified in close proximity of the Proposal area are identified in Section 6.5.

Heritage buildings are to be considered on a case by case basis. Where a historic building is deemed to be sensitive to damage from vibration (following inspection), it is recommended to reduce the vibration criteria accordingly in line with the *Construction Noise and Vibration Strategy* (TfNSW, 2018a).

The more conservative DIN 4150 (German Institute for Standardisation, DIN4150-3:1999-02 *Structural vibration – Effects of vibration on structures*) superficial cosmetic damage criteria of 2.5 mm/s should be considered for vibration sensitive structures. Where heritage buildings of a typical residential-type construction are not found to be structurally unsound, DIN 4150 superficial cosmetic damage criteria of 5 mm/s may be more suitable as a screening criterion.

The anticipated vibration impacts of the Proposal are summarised in Table 6-12.

Table 6-12 Summary of vibration impacts

Vibration assessment criteria	Impact and comment	Duration and nature
Human comfort	Based on safe working distances and the distance to the Proposal the work is anticipated to comply with the human comfort vibration criteria at all residential receivers.	Intermittent during piling and jackhammer use scenarios.
Cosmetic damage assessment	Based on the distance from the proposed work, structural or cosmetic damage from vibration intensive work is considered unlikely for adjacent receivers.	Intermittent during piling and jackhammer use scenarios.

Vibration assessment criteria	Impact and comment	Duration and nature
Heritage building impacts	<p>The separation and distance between the proposed equipment and heritage items (which are not part of the station and bridge infrastructure) would be sufficient to mitigate vibration levels from the use of identified equipment.</p> <p>Where vibration intensive work is required to be undertaken within the safe working distances in Table 6-8 or in close proximity to vibration sensitive heritage structures such as the station building and the footbridge, vibration monitoring should be undertaken to ensure acceptable levels of vibration.</p>	Intermittent during piling and jackhammer scenarios.

b) Operational phase

Due to the minor to negligible increase in operational noise, noise monitoring and assessment was not completed.

The key identified fixed noise sources associated with the station upgrade are the proposed lifts to be installed, the PA system upgrade and the new padmount substation.

At this stage of the design, specific lift systems and electrical equipment for the padmount substation have not been selected, which means it is too early to assess compliance with the applicable noise criteria. However, given that the noise source of these new elements have relatively low noise emissions, it is anticipated that additional noise sources could be relatively easily mitigated if required during the detailed design phase of the Proposal through the selection of appropriate equipment. The applicable criteria for operational noise (i.e. PTNLs) for the new operational equipment are included in Table 6-9.

6.3.3 Mitigation measures

Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Construction Noise and Vibration Strategy* (TfNSW, 2019h) and the Noise and Vibration Impact Assessment (SLR, 2020b) and in consultation with impacted receivers.

The CNVMP would prescribe reasonable and feasible mitigation measures to minimise construction noise and vibration. The measures would focus on contractor inductions, selection and operation of plant and equipment, work scheduling (including respite periods), prescribing safe working distances for vibration intensive equipment, procedures for noise and vibration monitoring and obtaining approvals for out of standard hours work. The CNVMP would also detail requirements for managing potential vibration impacts to heritage structures through monitoring and safe working distances.

For any highly affected noise receivers (over 75 dB), Transport for NSW would communicate with the impacted residents regarding the duration and noise level of the work, and by describing any respite periods that would be provided.

Operational plant and equipment would be designed with regard to the PTNLs.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.4 Indigenous heritage

6.4.1 Existing environment

A due diligence assessment was undertaken for the Proposal in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Office of Environment and Heritage, 2010). An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the Proposal area plus a 200 metre radius, on 2 September 2020. No Aboriginal sites were identified in the search.

Certain landscape features, such as nearby waterways, sand dune systems, ridge tops, ridge lines, headlands, cliff faces and rock caves / shelters, can indicate the likely presence of Indigenous objects. None of these features are present immediately surrounding the station and therefore the Proposal is not considered to be located within a high risk landscape for Indigenous heritage potential. The extensive landscape modification and high level of disturbance that has occurred across the Proposal area suggests that the presence of culturally sensitive buried items is unlikely within the boundaries of the Proposal.

6.4.2 Potential impacts

a) Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbing activities as listed in Section 3.4.4. Ground disturbing activities have the potential to impact Indigenous sites if present.

As no known Indigenous heritage items are located in the vicinity of the Proposal area and no high-risk landscape features are located at or near the Proposal area, the potential for unknown items to be present is considered to be low. As such, the Proposal is unlikely to affect Indigenous heritage during construction.

b) Operational phase

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

6.4.3 Mitigation measures

If previously unidentified Indigenous objects are uncovered during construction, in accordance with Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2019b), work would cease in the vicinity of the find and the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager would be notified immediately to assist in co-ordinating next steps which are likely to involve consultation with an archaeologist, the Energy, Environment and Science Group, DPIE and the Local Aboriginal Land Council/s. If human remains are found, work would cease, the site would be secured and the NSW Police and the Energy, Environment and Science Group would be notified.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.5 Non-Indigenous heritage

A Statement of Heritage Impact (SoHI) has been prepared by RPS (2020b) for the Proposal. This included a desktop assessment and site inspection of the Proposal area on 13 August 2020. The assessment of the SoHI is summarised in this section.

6.5.1 Existing environment

A desktop search of historic registers including the World Heritage List, National Heritage List, Commonwealth Heritage List, NSW State Heritage Register (SHR), RailCorp's Section 170 Heritage and Conservation Register and the heritage schedule of the Ku-ring-gai LEP was undertaken for the Proposal area and surrounds.

Heritage listed items in and within the vicinity of the Proposal are listed in Table 6-13 and a historical photograph is shown in Figure 26. Pymble Railway Station Group is listed on RailCorp's Section 170 Heritage and Conservation Register. The extent of the heritage listing for the station is shown in Figure 25.

Table 6-13 Heritage items in proximity to the Proposal area

Name / Item	Listing no.	Register	Location in relation to Pymble Station
Pymble Railway Station Group	State Heritage Inventory No. 4801068	s.170	Within
Former Police Station	I69	LEP	20 metres south of the Proposal area
Pymble Hotel	I70	LEP	20 metres west of the Proposal area
Uniting Church	I68	LEP	30 metres south of the Proposal area
Dwelling House	I78	LEP	40 metres north of the Proposal area
Dwelling House "Claverton"	I59	LEP	60 metres north of the Proposal area
Park Estate Conservation Area	C7	LEP	60 metres north of the Proposal area
Pymble Heights Conservation Area	C8B	LEP	80 metres east of the Proposal area

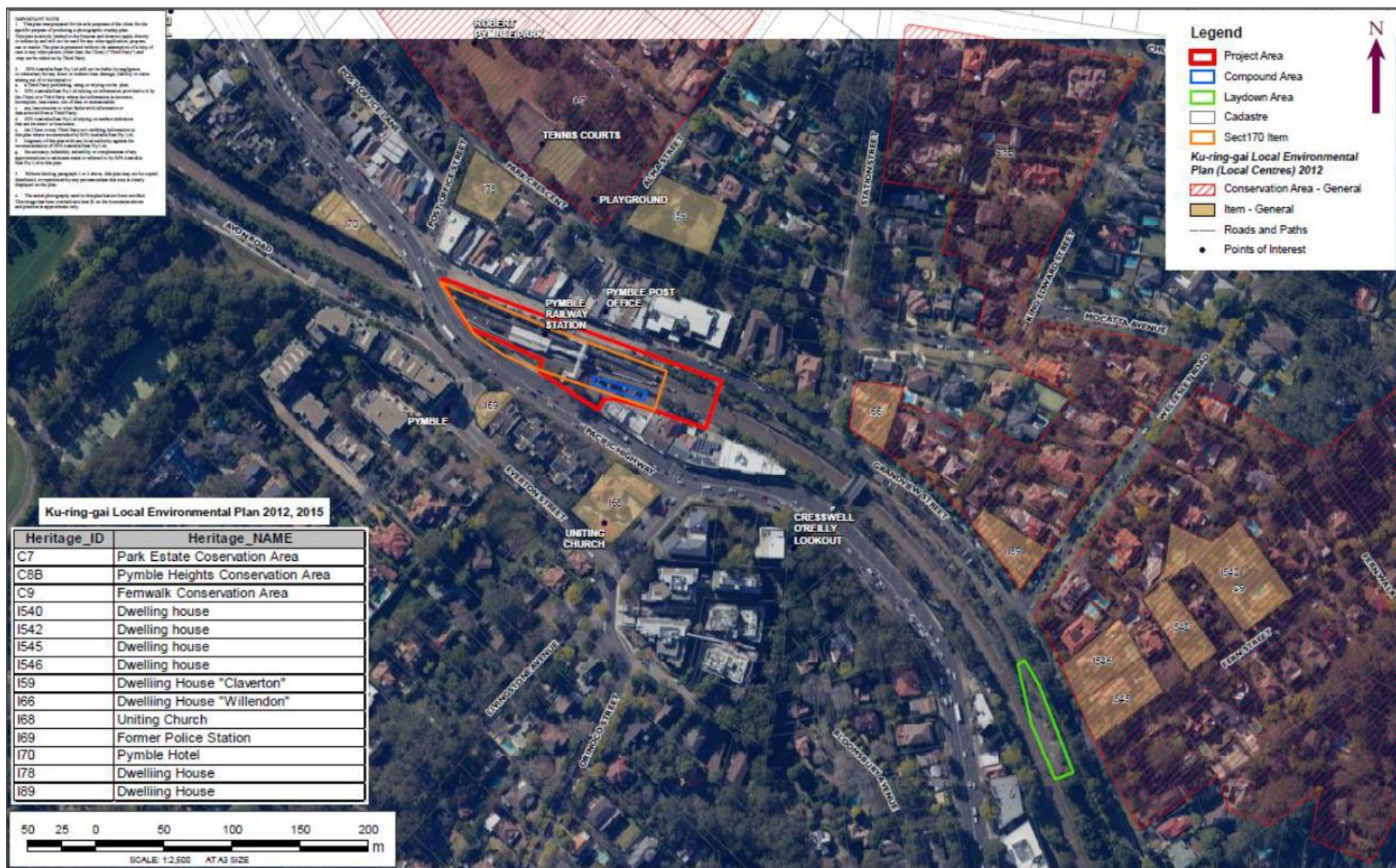


Figure 25 Pymble Railway Station Group and local heritage items in proximity to the Proposal

It is not anticipated that there would be direct adverse impacts to the items in proximity to the Proposal area due to the nature and scale of the proposed work, and no further assessment of these items has been undertaken.

Historical background

Robert Pymble, arriving from Hertfordshire, England in 1821 acquired a land grant of 600 acres in June 1823. The suburb of Pymble was subdivided in the early 1880s in anticipation of the construction of the North Shore railway line.

Pymble Station was established as part of the North Shore railway line extension between Hornsby and St Leonards in 1890, with Pymble Station opening on 1 January 1890. Since this time, Pymble Station and the surrounding railway line have undergone several modifications including:

- 1890 – single track North Shore railway line from Hornsby to St Leonards opened. Pymble Station was opened, the platform was constructed and an existing building was used as a ticket office and shelter
- 1895 – station building was constructed
- 1904 – the platform was lengthened
- 1909-1910 – the North Shore railway line was duplicated and an island platform with a footbridge over the railway line, and a station building was constructed. The 1890 platform was removed
- 1927 – electrification of the line between Milsons Point and Hornsby
- 1940 – the existing goods shed was closed, with the business diverted to Gordon
- 1945 – minor alterations to the interior of the station building including a new ticket counter and shelving
- 1954 – a book stall was erected on the footbridge, operated by Dymocks Book Arcade Ltd (now a vacant kiosk)
- 1990s – station upgrades including the addition of canopies, enhanced security systems, repainting and resurfacing of the platform. Footbridge upgrades including canopy modifications, new precast concrete floor, stair treads and steel roof and side panels were also added
- 2017 – present station refresh including repainting; tuckpointing; removal and decluttering of redundant services, fixings, cabling and signage; upgrade of toilets; installation of a roof safety system, upgrading of lighting to all footbridge stairs, platforms, canopies and awnings; and landscaping.



Figure 26 Pymble Station (undated, flickr)

Pymble Railway Station Group

Chapter 4 of the SoHI provides a detailed description of the existing physical condition for those elements listed in the Section 170 Heritage and Conservation Register listing, likely to be directly impacted by the Proposal including:

- station building (exterior): the exterior of the station building is of high significance, as a standard Type A10 station building with the predominant architectural detail remaining intact. The cast iron cantilevered brackets that support the timber framed awning, and the brick chimneys with rendered cornice are also intact
- station building (interior): the interior of the station building is of moderate significance to the station overall. Though the layout has been altered, the architectural detailing, such as the ceiling roses and plaster cornices, joinery and coloured glass panels, is intact throughout
- platform: the platform is a component of moderate significance dating to the 1909-1910 improvement of the station. The fabric is relatively intact
- footbridge: the footbridge is a component of high significance, featuring relatively rare haunched beams, reinforced steel joist trestles and Newel posts featuring the rare knob design
- covering from footbridge to the station building: the covering connecting the footbridge and station building dates to the 1990 upgrade and is an intrusive component.

The Statement of Significance from the SHR listing reads as follows:

Pymble Railway Station is significant at a local level. Pymble Railway Station, opened in 1890, has historical significance as there was limited settlement in the area prior to this date and the

construction of the railway was instrumental in encouraging the rapid subdivision and development of the area. Pymble Railway Station has aesthetic significance at a local level as a good example of a standard design Station building in its original context, dating from the 1909 duplication. Pymble Railway Station has aesthetic significance in particular due to its well-known landmark qualities, particularly the elevated footbridge which forms an important visual element of the Station precinct viewed both from the Pacific Highway and from Grandview Street.

The footbridge was identified as an item of high heritage significance in the 2016 Railway Footbridges Heritage Conservation Strategy. It retains a high degree of integrity and is a good representative of an early twentieth century haunched beam footbridge with a trestle sub-structure. It is unusual in that it retains its original balustrades on both the footbridge and stairs.

There are three moveable heritage objects at Pymble Station including a safe located in the Ticket Office, a wall mounted circuit phone board and indicator boards mounted to the exterior wall of the station building. The objects are included on the station's Moveable Heritage Register, which is part of the s170 listing.

Potential archaeological features

A brick footing at the easternmost end of the platform of Pymble Station was recorded in 2018, which had been exposed during the resurfacing of the platform (Figure 27). The footing, thought to be related to an ancillary facility, is sited within the part of the platform that had been extended in c1927 as part of the electrification of the North Shore railway line.



Figure 27 Brick footing exposed at the eastern end of the platform, looking northeast (Extent, 2018)

The archaeological potential of the Proposal area is low. The original 1890 station was located within Robert Pymble's 600-acre grant at Pymble, which is identified on the 1835 Map of the Parish of Gordon. The map indicates a building had been constructed within the 600-acre grant by 1835, and it is possible that part of the building was used for the station prior to the construction of the station building in 1895.

Though there is potential for archaeological resources associated with the 1895 station including the former platform, station building and shed to the south of the existing station, it is unlikely that any archaeological resources would be intact due to ground disturbance associated with below ground utilities infrastructure including telecommunications and sewer.

Though archaeological resources may be associated with the development of the station from 1890, such archaeological resources are unlikely to meet the threshold for significance at a

local level and are therefore unlikely to meet the definition for a relic under the *Heritage Act 1977*.

6.5.2 Potential impacts

a) Construction phase

An assessment of heritage impact has been undertaken in accordance with the definitions in Table 6-14.

Table 6-14 Defining level of impact

Level of impact	Description
Major adverse	The Proposal would have a severe, long-term and irreversible impact on the item. This includes partial or complete demolition of the item or additions in the vicinity of the item that would impact the visual setting of the item.
Moderate adverse	The Proposal would have an adverse impact on the item. This includes removal of an important aspect of the setting or temporary removal of significant elements or fabric. This impact could be reduced through appropriate mitigation measures.
Minor adverse	The Proposal would have a minor adverse impact on the item. This may be the result of the action affecting only a minor element or part of the setting. This impact may be temporary or reversible.
Little to no impact	The Proposal is minor in nature. The impact of the Proposal to the significance of the item is negligible due to the nature of the work or through appropriate mitigation.

Station access and interchange facilities

The SoHI has assessed the potential impacts of the modifications to the station access and interchange facilities on the heritage characteristics and features of the station. It concluded there would be a **moderate adverse** impact to the heritage significance of the station group as a result of the installation of three new lifts as:

- the bulk of the lifts would detract from the significance of the footbridge, in addition to impact to the balustrade which is heritage fabric
- the lift landing structures would be independent from the footbridge however, minimising the impact to significant fabric
- there would be a cumulative impact of installing three lifts connecting to the footbridge
- the lifts would affect views to, and from, the station.

The materials selected for the lift shafts and lift canopies, and the extension and replacement of canopies would be based on the criteria of durability, low maintenance and cost effectiveness, and to minimise the visual impact of the Proposal. The design has considered the heritage qualities of the footbridge through:

- respecting the significance of the station through the retention of the footbridge, which is a component of high significance and is representative of an early twentieth century haunched beam footbridge with a trestle sub-structure
- minimising the impact to significant fabric by designing the new lift landings to be independent of the footbridge

- locating and connecting the lifts to the footbridge in a consistent and symmetrical way, to minimise the visual impact of the Proposal.

The extension of a canopy from the platform lift to the boarding assistance zone to provide covered access is a **moderate adverse** impact, adding bulk at platform level and obscuring views of the station building from the footbridge. The materials and finishes would be designed to match the existing.

The impact of the new stairs and canopy at the Pacific Highway station entrance is assessed as **moderate adverse**, as:

- the footbridge is a significant component of the station and the demolition of significant fabric of the footbridge would have an adverse impact
- the Proposal would alter the form of the footbridge, the existing fabric being replaced with new stairs and a footpath
- it would not impact the visual or functional relationship of the footbridge to other station components such as the station platform and building
- the Proposal would involve the temporary removal of rare Newel posts sited at the top of the existing stairs which would be reinstated upon completion.

To minimise the impact of the Proposal, materials would be selected to match the existing.

Other heritage impacts associated with the station entrances and interchange facilities include:

- regrading of the landings to the lifts, replacement of TGSIs on the stairs and the installation of new directional TGSIs and stair nosings is negligible (**little to no impact**)
- securing the new handrail to the footbridge would have a **minor adverse** impact due to the potential impact to heritage fabric
- the accessible path at the Pacific Highway station entrance and the new widened stair entrance would have a **moderate adverse** impact, associated with the broader impact of the modification of the station entrance.

Station building and platform modifications

The station building is a significant component of Pymble Station. The exterior of the building is of high significance; the interior of the building is of moderate significance. The removal of internal walls and fittings and the installation of new fittings, fixtures, finishes and services connections (water, wastewater, electrical and mechanical services) would impact the internal fabric of the station building.

The adjustments required for the family accessible toilet and unisex ambulant toilet include internal wall modifications, floor lowering, and the installation of a new door for the family accessible toilet at the end of the station building to provide a wider access. The knocking out of a door at the end of the station building and the demolition of the internal wall dividing the existing male and female toilet would have only a minimal impact as the existing interior and exterior fabric of the western end of the station building has been substantially altered. The impact associated with the station building modifications is **little to no impact**. Improving the accessibility of the existing facilities would not impact the ability of customers to view and appreciate the significance of the station building.

The SOHI concluded that the electrical upgrades (including undergrounding), regrading and resurfacing of the platform, improvements to lighting and CCTV and TGSIs on the platform and footbridge stairs would have **little to no impact** on the heritage significance of the station.

The ancillary facilities of the Proposal are temporary and while the construction compound is located within the s170 curtilage, the impact on the setting of the station is negligible (**little to**

no impact). The temporary laydown area within the rail corridor would not impact the heritage significance of the station. No ground disturbing work has been proposed in this lay down area and therefore the potential impact on archaeological resources is negligible.

Overall impact

Overall, the impact of the Proposal is assessed as **moderate adverse**. Though several aspects of the proposal respect the heritage significance of the station, such as the retention of the footbridge, there are several aspects of the Proposal that contribute to an adverse cumulative impact, including the addition of three lifts connecting to the footbridge and the addition of canopies at the station entrances and the platform, which would add considerable bulk and impact the view of the station building from the footbridge.

b) Operational phase

The operation of the Proposal would not substantially impact non-Indigenous or archaeological heritage. While there would be major adverse impact on the heritage setting of the station associated with the demolition of the existing stairs at the Pacific Highway station entrance, and modifications to the station building, this would be offset by the long-term benefits by improving accessibility at Pymble Station.

6.5.3 Mitigation measures

A number of mitigation measures are proposed to minimise the heritage impact of the Proposal on the Pymble Railway Station Group, including:

- a suitably qualified heritage architect would be engaged from the detailed design phase through to construction to ensure compliance with the relevant heritage approvals, and to further minimise the impact of the Proposal through the use of appropriate form, proportion and materials
- the possible salvage and reuse of heritage fabric (such as the footbridge balustrade) would be considered during detailed design
- the design would include the reinstatement of the Newel posts which would require temporary removal and protection during construction
- impact to the station building associated with knocking out a door in the existing wall of the station building should be minimised through design, and care should be taken when fixing required infrastructure to the exterior of the station building
- the assessment of archaeological potential has been limited to the Proposal area (assessed as low). Further assessment of the potential archaeological impacts would be required if ground disturbing work is proposed for any areas outside these locations, including at the potential lay down site within the rail corridor
- impact to known archaeological resources at the eastern end of the Station platform should be avoided. Care should be taken to avoid impact during the proposed regrading and resurfacing
- a photographic archival record of Pymble Station would be prepared prior to, and at the completion of construction, in accordance with applicable guidelines.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.6 Socio-economic impacts

6.6.1 Existing environment

Land uses within the suburb of Pymble generally comprise low to high density residential developments with a commercial precinct (Pymble shopping village) located along Grandview Street, and commercial / retail facilities along the Pacific Highway. Other notable features around the station precinct include Pymble Uniting Church, and Pymble Hotel, situated on the Pacific Highway which are both within 100 metres of the Proposal area.

The Pymble shopping village mainly features buildings with commercial shop frontages with office space atop. The shopping village includes boutique stores and food outlets, health care and beauty services, gyms and real estates.

Pymble Ladies' College forms a significant part of the local community and many students travel via train to and from school. Refer to Section 1.3.2 for the commercial, educational and religious sites in the surrounding area.

The closest residential properties to the Proposal are within 30 metres from the Proposal area, on the southern side of the Pacific Highway. There are also residential properties adjacent to the Pymble shopping village which are within 30 metres of the Proposal area.

Robert Pymble Park is located approximately 80 metres north of the station and features a playground, an open grass field and tennis courts, and established trees providing shaded areas. A masterplan for the space has been prepared by Ku-ring-gai Council to increase recreation opportunities, improve accessibility, upgrade facilities and integrate sustainability principles. Upgrades are anticipated to commence in 2021.

A review of the Australian Bureau of Statistics 2016 Census data indicates the suburb of Pymble has a population of 11,051 people, with a median age of 40 years. Of the employed persons at Pymble, 29 per cent use public transport as at least one of their methods to travel to work, 21.5 per cent being via train. People aged 65 years or over made up approximately 14.4 per cent of the population.

The *North District Plan* predicts that the North district would have a 47 per cent increase in the population of those aged between 65 – 84 years, and an 85 per cent increase in the population of those aged between 85 years and above, by the year 2036. One of the ten directions for the metropolis of three cities and the North district is to create a well connected city by developing a more accessible and walkable city, which is important to meet changes in the demographics of the district (Greater Sydney Commission, 2018a and 2018b).

Further, one of the guiding principles of the *Our Ku-ring-gai 2038* is access, where all people should have fair access to services, resources and opportunities to improve their quality of life. *Our Ku-ring-gai 2038* identifies the importance of improving access and mobility to and from local centres such as Pymble by providing a better integrated and accessible pedestrian and transport network, and ultimately increasing public transport use within the local government area (Ku-ring-gai Council, 2018).

The proposal would be designed so that people of all ages and abilities can participate in community life by increasing access to public transport, contributing to positive liveability, productivity and sustainability outcomes.

According to the Transport for NSW Transport Performance and Analytics data, the AM peak hour demand at Pymble Station in 2017 was 657 passengers and is forecast to increase to 801 passengers by 2036. The peak 2036 demand is expected to reach 921 passengers in the AM peak hour. The Proposal has been designed to accommodate the forecast Sydney Trains patronage growth and changing travel patterns, including an ageing population. Pymble Station has a number of existing facilities for customers including ticket machines, Opal card

readers, male and female toilets (non-accessible). Other transport facilities are discussed in Section 6.1.

6.6.2 Potential impacts

a) Construction phase

The construction phase of the Proposal has the potential to impact station customers, pedestrians, adjacent residents, school students, commercial facilities and motorists due to:

- pedestrian and traffic changes associated with the partial road closures and footbridge closures
- minor increase in traffic including truck movements delivering site materials, plant and equipment
- temporary parking loss at the Pacific Highway station entrance carpark to accommodate the site compound
- temporary parking rearrangements on Grandview Street required for modifications to the Grandview Street station entrance and lift, and utility relocations
- temporary closure and / or relocation of toilet facilities at the station
- construction noise, vibration, dust and visual impacts.

b) Operational phase

It is anticipated that the Proposal would result in the following benefits to Pymble and the wider area including:

- improved and equitable access to Pymble Station for customers resulting from the installation of lifts and accessible parking
- improved customer amenity and facilities at the station including a family accessible toilet, ambulant toilet, CCTV, improved wayfinding and new lighting
- improved safety and upgrade of the footbridge by improving its condition
- potential increased use of public transport to and from Pymble.

It is noted that the Proposal would require the removal of the existing (vacant) kiosk on the footbridge, however similar services are provided for in the nearby Pymble shopping village so it is expected that this would have only a minor impact to the community.

6.6.3 Mitigation measures

A number of environmental safeguards would be implemented to minimise potential impacts on the community including:

- mitigation measures in respect of potential impacts to amenity (e.g. noise, dust and visual) as assessed in the relevant sections of this report and listed in Section 7.2 of this report
- development of a Community Liaison Management Plan (to be developed by the Construction Contractor prior to construction) which would identify potential stakeholders and the best-practice methods for consultation. The Plan would identify tools to effectively communicate with each stakeholder group during construction and encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible

- informing the community of construction progress, activities and impacts in accordance with the Community Liaison Management Plan
- providing contact details for a 24-hour construction response line, Project Infoline and email address provided for ongoing stakeholder contact throughout the construction phase.

6.7 Biodiversity

A Flora and Fauna Assessment Report (RPS, 2020c) and Arboricultural Impact Assessment Report (Allied Tree Consultancy, 2020) was undertaken for the Proposal. This included a site inspection by a qualified ecologist and arborist on 25 August 2020, along with a review of relevant databases and other ecological resources including:

- NSW Biodiversity Conservation Division Atlas of NSW Wildlife
- Commonwealth Department of Agriculture, Water and the Environment Protected Matters Search Tool
- Biodiversity Conservation Division Threatened Species Profile Database.

6.7.1 Existing environment

Pymble Station is located within a suburban area which has been modified over a long period of time. Due to the long history of rail land use and site management, existing vegetation within the Proposal area consists of native and exotic plant species resulting from the suburbs colonial heritage. Figure 28 to Figure 31 provides a visual appreciation for the condition of the groundcover and midstory layers within the rail corridor and the mature vegetation within the Proposal area.

Some native species are also identified within the landscaped environment, though these have also been planted and are not locally endemic to the wider natural environment. Native species observed within the Proposal area are shown in Figure 28, Figure 29, and Figure 30 and are listed below:

- Willow Myrtle (*Agonis flexuosa*)
- Bottlebrush (*Callistemon viminalis*)
- Water Gum (*Tristaniaopsis laurina*)
- Brush Box (*Lophostemon confertus*)
- Coastal Banksia (*Banksia integrifolia*)
- Wallangarra White Gum (*Eucalyptus scoparia*)
- Willow Bottlebrush (*Callistemon salignus*).



Figure 28 Wallangarra White Gum (foreground) and Coastal Banksia (background) at the Pacific Highway station entrance



Figure 29 Willow Myrtle and Bottlebrush in the Grandview Street road verge and typical plantings within the rail corridor



Figure 30 Brush Box and Water Gum along Grandview Street



Figure 31 Rail corridor plantings / weeds near the Pacific Highway station entrance

A search using the EPBC Act protected matters search tool with a one kilometre radius of the Proposal area was undertaken on the 30 September 2020. The search identified 7 listed Threatened Ecological Communities, 26 threatened fauna species and 19 threatened flora species that may occur in the Proposal area. The Flora and Fauna Assessment (RPS, 2020c) confirmed there are no threatened ecological communities present in the Proposal area. One threatened flora species was detected within the Proposal area, namely Wallangarra White Gum (*Eucalyptus scoparia*). This species is listed as Endangered under the BC Act and Vulnerable under the EPBC Act, however it is a planted individual outside its natural range of occurrence (i.e. New England Tablelands) and does not form part of a viable population.

One hollow-bearing tree was identified in the Proposal area (the Wallangarra White Gum), however no other important fauna habitat features such as fallen logs or termite mounds were observed.

Analysis of data obtained from the Proposal area as part of the Flora and Fauna Assessment confirms the absence of native vegetation cover forming part of a recognised plant community type (PCT) listed in the NSW BioNet Vegetation Information System (Biodiversity Conservation Division, 2019). Vegetation observed is consistent with regional vegetation mapping (i.e. urban Exotic / Native).

A total of five fauna species were identified during opportunistic surveys of the Proposal area. These include:

- Sulphur Crested Cockatoo (*Cacatua galerita*).
- Rainbow Lorikeet (*Trichoglossus moluccanus*)
- Noisy Miner (*Manorina melanocephala*)
- Welcome Swallow (*Hirundo neoxena*)
- Common Myna (*Sturnus tristis*)

These species are commonly found in the urban environment and none are listed as either threatened or migratory species.

Noxious weeds identified within the Proposal area that are Weeds of National Significance (weeds agreed by the Australian governments as prioritised for eradication based on their invasiveness, potential for spread and environmental, social and economic impacts) include Asparagus Fern (*Asparagus aethiopicus*). Other weeds that pose biosecurity duties include small-leaved Privet (*Ligustrum sinense*), Large-leaved Privet (*Ligustrum lucidum*) and Japanese Honeysuckle (*Lonicera japonica*).

6.7.2 Potential impacts

a) Construction phase

Direct impacts

The Proposal may require the removal of up to 16 trees to facilitate the upgraded station entrances and lifts, and for utility undergrounding / relocation. One tree would be directly impacted by the proposed design at the Pacific Highway station entrance, with two further trees subject to a major encroachment in this area (i.e. the infrastructure design is in excess of 10 per cent of the tree protection zone). Opportunities for retention of trees would be explored through detailed design, and trees nominated for retention would require targeted tree management and monitoring during and at the completion of construction.

Utility relocation along Grandview Street would require under boring, where the entry and exit pits should avoid the structural root zone for any tree. Pending the vicinity of these pits, root mapping, or excavation measures that are sympathetic towards root retention should be

employed. However, based on the size and number of trees within a limited area, it is unlikely that trench type excavation would be viable without adversely affecting these trees. Once the utility design has been progressed, a project arborist would be required to provide a work methodology for the installation of this conduit.

A summary of these trees has been assessed in the Arboricultural Impact Assessment (Allied Tree Consultancy, 2020) for the Proposal, and their approximate location is shown in Figure 32. In summary:

- Trees numbered 1 to 13 north of the station within the Grandview Street road reserve may require removal to facilitate the installation of an underground electrical conduit. During detailed design, alternate construction methodologies that are sympathetic toward root retention / tree protection would be explored and implemented where possible
- Trees numbered 28, 29 and 30 near the Pacific Highway station entrance may require removal due to design encroachment, which is required to facilitate the construction of the proposed lift and walkway from the Pacific Highway.

The removal of these trees is not considered to have an impact on the overall ecological values of the areas as it would not result in the loss of a naturally occurring plant community type.

Table 6-15 Tree removal (Allied Tree Consultancy, 2020)

Tree number ¹	Species	Description
1	Willow Myrtle (<i>Agonis flexuosa</i>)	A five metre high native tree located within the road reserve on Grandview Street. Active fungus and decay pathogens were present. Assessed as offering minimal significance and there may be an opportunity for replacement with compensatory plantings.
2	Bottlebrush (<i>Callistemon viminalis</i>)	A five metre high native tree located within the road reserve on Grandview Street. Assessed as offering minimal significance and there may be an opportunity for replacement with compensatory plantings.
3	Willow Myrtle (<i>Agonis flexuosa</i>)	A four metre high native tree located within the road reserve on Grandview Street. Assessed as offering minimal significance and there may be an opportunity for replacement with compensatory plantings.
4, 5, 6 and 7	Water Gum (<i>Tristaniaopsis laurina</i>)	Three to four metre high native trees located within the road reserve on Grandview Street. Assessed as having high value and work adjacent to these trees should allow for tree retention and protection if feasible through construction methodology.
8, 9, 10, 11, 12 and 13	Brush Box (<i>Lophostemon confertus</i>)	Five to 10 metre high native trees located within the road reserve on Grandview Street further east. Assessed as having high value and work adjacent to these trees should allow for tree retention and protection if feasible through construction methodology.
28	Coastal Banksia (<i>Banksia integrifolia</i>)	A six metre high native tree located directly within the footprint of the proposed design for the new path connecting the footbridge to the Pacific Highway and the lift. The tree is assessed as having limited visual amenity and value.

Tree number ¹	Species	Description
29	Wallangarra White Gum (<i>Eucalyptus scoparia</i>)	A 22 metre high native tree subject to major encroachment from the proposed design of the lift foundations, excavations for retaining wall realignment and the new path connecting the footbridge to the Pacific Highway and the lift. The work is proposed within the tree protection zone and structural root zone of the tree. The tree is assessed as having high amenity value due to its size, however the tree has been subject to failure of large branches and contains active decay. The tree is very likely for failure and poses a moderate to extreme risk rating given its proximity to the Pacific Highway.
30	Willow Bottlebrush (<i>Callistemon salignus</i>)	A six metre high native tree subject to major encroachment due to resurfacing of the Pacific Highway car park.

Note 1: Tree numbers are derived from the Arboricultural Impact Assessment and represented in Figure 32 of this REF



Figure 32 Trees likely to require protection or removal to be confirmed during detailed design

Indirect impacts

The most likely indirect impact arising from the Proposal is the introduction, establishment and spread of weeds within the Proposal area and to adjoining areas of vegetation. Weed

establishment and spread generally results from soil disturbance and excavation as well as use of equipment that may carry weed propagules.

Mitigation measures to be implemented during the construction and operational phases of the Proposal are recommended to manage and control the incidence and effect of noxious and environmental weeds on the receiving environment. There is potential for high threat weeds observed within and adjacent to the Proposal to benefit from construction work that involves disturbance. Therefore, the management of these species would be a means of minimising any indirect impacts on the adjoining environment.

Fauna habitat

The area impacted by the Proposal has limited habitat of value to native flora and fauna. One hollow-bearing tree was identified in the Proposal area, however no other important fauna habitat features such as fallen logs or termite mounds were observed. A culvert was also observed to the east of the Proposal area that may provide habitat value for species that may use caves or similar structures for roosting (e.g. microchiropteran bats).

Vehicle, plant and construction equipment would temporarily increase noise pollution within the Proposal area. This can cause disruption to normal fauna activity and lead to the departure of species from an area during construction.

Key Threatening Processes

Key Threatening Processes are listed under Schedule 4 of the BC Act and EPBC Act. There are no relevant Key Threatening Processes that have the potential to affect biodiversity values within the Proposal area. The proposed vegetation removal is not of a scale to cause significant impacts.

b) Operational phase

No operational impacts to biodiversity are anticipated from the Proposal.

6.7.3 Mitigation measures

A number of additional environmental safeguards would be implemented to minimise potential impacts to biodiversity:

- under boring or excavation methods for utility installation along Grandview Street that are sympathetic toward root retention should be investigated with a suitably qualified Arborist, to explore opportunities for tree retention and protection where possible
- given the amenity value of the Wallangarra White Gum on the Pacific Highway (subject to major encroachment), the consideration for tree removal would be supported by a Level 3 internal diagnostic assessment coupled with an aerial assessment to determine the risk, respective mitigation, and useful life expectancy. The outcome of this assessment can confirm tree removal or otherwise tree retention and with design mitigation measures to reduce the impact on the root system
- installation of artificial hollows is recommended to account for the loss of those present in the Wallangarra White Gum should removal be required. This is to be in line with Council recommendations, with the number of hollows present to be confirmed at the time of felling. Design should be targeted to microchiropteran bat habitat
- should the detailed design or construction work (including site establishment) determine the need to remove or trim any additional trees to that assessed in this REF, the Construction Contractor would complete the Transport for NSW Tree

Removal Application Form and submit it to Transport for NSW for review and approval

- work within proximity to existing native trees would consider the tree protection zone (TPZ), which is calculated as a circular area with a radius 12 x the diameter at breast height of the tree in line with *AS 4970-2009 Protection of Trees on Development Sites*. Any ground disturbance within this area (i.e. for sub-surface utilities and regrading) would require an arborist to undertake further assessment before proceeding
- protection of the trees nominated for retention would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites*, and the Arboricultural Impact Assessment (Allied Tree Consultancy, 2020)
- offsets and/or landscaping would be undertaken in accordance with the Transport for NSW *Vegetation Offset Guide* (TfNSW, 2019c) and in consultation with Ku-ring-gai Council. The Proposal would require the removal of up to 16 trees, which would be offset with the planting of 76 locally endemic native tree species. Any additional clearing would also require assessment and tree offset planting
- weed control measures, consistent with the Transport for NSW *Weed Management and Disposal Guideline* (TfNSW, 2019a), are to be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during construction. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015*.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.8 Contamination, landform, geology and soils

6.8.1 Existing environment

The Proposal is located within the Ku-ring-gai LGA, situated on the Hornsby Plateau between Hornsby and Chatswood. This plateau typically consists of Ashfield Shale of the Wianamatta Group and features dark grey mudstone and silty shale with frequent iron carbonate mudstone bands. Pymble Station is situated within a cutting along its full length. A review of the Atlas of Australian Soils (CSIRO) indicates that the soil profile in Pymble consists of red and brown chromosols (red and brown Podzolic soils) and yellow chromosols (yellow Podzolic soils) which have a low-moderate erosion hazard.

A review of the NSW EPA Contaminated Land Register on the 16 September 2020 indicated that the Proposal area is not listed as a contaminated site, nor has the site been subject to any regulation under the *Contaminated Land Management Act 1997*.

A review of the DPIE's Acid Sulfate Soils dataset indicated that there is no known occurrence of acid sulfate soils (ASS) within 200 metres of the Proposal footprint, therefore there is a low probability of ASS occurrence in the Proposal area.

The AS 4482.1-2005 - *Guide to the investigation and sampling of sites with potentially contaminated soil - Non-volatile and semi-volatile compounds* lists the chemicals used by specific industries. The Standard lists the following chemicals that are commonly associated with railway yards:

- hydrocarbons
- arsenic
- phenolics
- heavy metals

- nitrates and ammonia.

As Pymble Station has been in operation since 1890 and undergone upgrades in the 1900s, it is anticipated that possible contamination from fill materials may be present such as heavy metals and asbestos. Given the age of a number of elements at the station, there is also potential for asbestos materials and lead paint to be encountered.

6.8.2 Potential impacts

a) Construction phase

Excavation and other earthworks are described in more detail in Section 3.4.4, and if such activities are not adequately managed, could result in the following impacts:

- erosion of exposed soil and any stockpiled materials
- dust generation from excavation and vehicle movements over exposed soil
- an increase in sediment loads entering the stormwater system and/or local runoff.

It is expected that erosion risks would be adequately managed through the implementation of standard measures as outlined in the *'Blue Book' - Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

Excavation also has the potential to expose contaminants, which if not appropriately managed, can present a health risk to construction workers and the community. The exposure of contaminants could also pose an environmental risk if they were to enter nearby waterways through the stormwater infrastructure.

The Proposal has the potential to disturb asbestos containing material and other hazardous substances (such as lead paint) from the proposed work within the station building and demolition of the existing kiosk on the footbridge. There is also potential for construction activities to result in the contamination of soil through accidental fuel or chemical spills from construction plant and equipment.

b) Operational phase

There would be no 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 Control Plan/s would be prepared and implemented in accordance with the *'Blue Book' - Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). The Erosion and Sediment Control Plan would be established prior to the commencement of construction and be updated and managed throughout according to the activities occurring during construction.

An environmental risk assessment would be undertaken prior to construction and would include a section on contamination as per the Transport for NSW Standard Requirements. Measures to mitigate potential impacts from contaminated soil/materials would include an unexpected contamination finds procedure and Waste Management Plan, as part of the CEMP. All waste would be managed in accordance with relevant legislation.

Appropriate mitigation measures would be implemented to manage hazardous substances during demolition work. This would include the removal of hazardous materials from the structure by appropriately licensed asbestos/hazardous waste removalists and in accordance with relevant legislation and guidelines.

Refer to Section 7.2 for a full list of proposed mitigation measures.

6.9 Hydrology and water quality

6.9.1 Existing environment

Pymble Station is located in a cutting, and a track drainage system comprises a drain on the southern side of the rail corridor. The Proposal area is located approximately 300 metres southeast from the nearest watercourse and riparian land, Blackbutt Creek.

There are no areas surrounding Pymble Station that are designated as flood planning areas under the Ku-ring-gai LEP due to the absence of any large rivers and floodplain areas. A flood study was undertaken for the Blackbutt Creek catchment which drains to the Lane Cove River (GHD, 2018). The Blackbutt Creek drains in a southerly direction, with Pymble in the upper reaches of the catchment. With the station located on the catchment boundary it can be assumed that local catchment at and around the station will be small, and mostly draining away from the station. As such, the Proposal area is unlikely to be impacted by mainstream 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.

Activities which would disturb soil during construction work (such as vegetation removal and excavation) have the potential to impact upon local water quality due to erosion and sedimentation. There is also potential to contaminate local water quality and the stormwater network as a result of incidental spills or inadequate fuel and chemical storage practices.

In an extreme rainfall event, flooding may impact on construction activities. Moderate to heavy wet weather events may cause water flows through the Proposal area which could increase the potential for soil erosion and sedimentation impacts in the cutting and the rail corridor.

Mitigation measures have been provided below to minimise the potential for these impacts.

b) Operational phase

The Proposal would have little impact upon the hydrology in the surrounding area, however, this would be confirmed during the detailed design phase. The detailed design would take stormwater management around new and existing structures into consideration.

6.9.3 Mitigation measures

As noted in Section 6.8.3, Erosion and Sediment Control Plan/s 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. Dewatering (if required) would be undertaken in accordance with the Transport for NSW *Water Discharge and Reuse Guideline* (TfNSW, 2019e).

Refer to Section 7.2 for a full 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 characteristic of an urban environment, with some transport emission influences. The Environment, Energy and Science Group of DPIE undertakes air quality monitoring across NSW. Macquarie Park is the closest monitoring site to the Proposal. A search of the daily regional air quality index for Macquarie Park on 17 September 2020 showed that the site experienced 'Very Good' air quality values.

Potentially affected receivers within the vicinity of the site include the following:

- local residents
- users of the adjacent commercial areas
- pedestrians and commuters within the Pymble Station and Pymble shopping village precinct.

6.10.2 Potential impacts

a) Construction phase

During construction, air quality impacts would be associated with the generation of dust and emissions from the operation of stationary and moving on-site machinery and associated vehicular traffic. Particulate emissions would be associated with a number of stationary and mobile sources as well as minor potential for wind erosion of areas of exposed soil.

Anticipated sources of dust and dust generating activities include:

- loading and transfer of material from trucks
- trenching and excavation activities associated with lift installation, kerb modifications, services relocation etc
- construction activities associated with station building modifications and platform regrading.

The Proposal would have a 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. Appropriate measures would be established to manage dust emissions from demolition work, particularly near adjacent commercial receivers on Grandview Street and the Pacific Highway, and residential receivers.

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. The likely airborne dust load generated during a typical construction day would be small and therefore would be unlikely to result in reduced local air quality at the nearest potentially affected receivers, given the relatively small construction footprint, and with the implementation of proposed control measures.

b) Operational phase

The Proposal is not anticipated to significantly increase customer traffic to and from the station. However, over the long-term there is anticipated to be an increase in patronage at Pymble Station. Increase in patronage at the station is not anticipated to significantly impact air quality in the station area.

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.

6.10.3 Mitigation measures

Section 7.2 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 exposed soil surfaces, covered loads and appropriate management of tracked dirt or mud on vehicles. Such measures would be included in the CEMP to be prepared for the Proposal.

6.11 Waste

During construction of the Proposal, the following waste materials would be generated:

- demolition waste (brick, concrete, steel, asphalt)
- excavated spoil
- building material wastes (including metals, timbers, plastics, packaging, fencing etc)
- surplus building materials
- electrical wiring and conduit waste (from electrical connections and utility relocation)
- green waste (including weeds)
- general waste, including food scraps 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 to identify all potential waste streams associated with the work including site compounds and construction materials. The plan would 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 the area tidy and free of rubbish.

The handling, storage, transport and disposal of asbestos and hazardous waste (including any lead waste) would be in accordance with the requirements of relevant EPA and Safe Work NSW guidelines. Waste management targets in consideration of the *Infrastructure Sustainability Rating Scheme – Version 1.2* (ISCA, 2018) would be developed for the Proposal and would include reuse and recycling.

The Proposal would not result in changes to operational waste management.

6.12 Sustainability

The design of the Proposal would be based on the principles of sustainability, including aiming for an excellent rating as a program under the ISCA Infrastructure Sustainability Rating Tool Version 1.2 and the Transport for NSW Environmental Management System (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.3.3 for more information regarding the application of these guidelines.

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

6.13 Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate and understand the limitation of adaptation. The effects of climate on

the Sydney region can be assessed in terms of weather changes, storm intensity, flooding and increased risk of fire.

A high-level climate change risk assessment screening was performed using the Transport for NSW *Climate Risk Assessment Guidelines* (TfNSW, 2017b), and relevant climate data and projections from Adapt NSW and the Bureau of Meteorology as part of the design development of the Proposal.

The climate projections for Metropolitan Sydney in 2030 include an increase in mean temperature of 0.7°C which is expected to rise 1.9°C by 2070. Projections also include an increase in the number of hot days with a maximum temperature of over 35°C and increased annual rainfall.

The risk assessment is based on the projected changes in the climate and the estimated design life of Proposal components to assess the likely consequences and likelihood of climate risks occurring. It concluded that:

- the Proposal is not situated on land mapped as bushfire prone. Given the predominantly urban environment of the Proposal area it is considered unlikely that increases in bushfires would impact the Proposal
- increased extreme heat days will continue to increase the risk of heat stress on station customers. For example, the lifts may pose a risk to human health in the event of a power outage during an extreme heat event
- the lift design should consider future temperature increases including insulation / glazing, cooling, and protections on electrical equipment
- the provision of a canopy along the platform to the station building would shelter commuters from extreme heat and rainfall events
- the design should avoid use of metal outdoor furniture.

6.14 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.

The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2019f) or other approved modelling tools. The carbon footprint would be used to inform decision making in design and construction. Greenhouse gas emissions would also be assessed in accordance with ISCA IS Rating Tool V1.2.

Due to the small scale of the Proposal and the short term temporary nature of the individual construction work, 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 7-1.

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

6.15 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. Multiple projects undertaken at a similar time/similar location may also lead to construction fatigue, particularly around noise, traffic and air quality impacts, if not appropriately managed.

A search of the Department of Planning and Environment's Major Projects Register, Sydney North Joint Regional Planning Panel Development and Planning Register, and Ku-ring-gai Council Development Application Register on 17 September 2020 identified that no major development applications are listed in close proximity to Pymble Station for approval at this time. Cascade Gardens, located at 2 Pymble Avenue comprising 98 residences and a neighbourhood shop are located approximately 100 metres south of the Proposal area and are estimated for completion of construction in 2020.

During construction, the work would be coordinated with any other construction activities in the area. Consultation and liaison would occur with Ku-ring-gai Council, TAHE/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 a minimal impact on the performance of the surrounding road network.

Based on this assessment, it is anticipated that the cumulative impacts would be negligible, 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.

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 Transport for NSW'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 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 7-1. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 7-1 Proposed mitigation measures

No.	Mitigation measure
General	
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of <i>Environmental Management Plan Guideline – Guideline for Infrastructure Projects</i> , NSW Department of Planning, Industry and Environment, 2020) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with Transport for NSW's <i>Guide to Environmental Controls Map</i> (TfNSW, 2019g) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
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.
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
Traffic and site access	

No.	Mitigation measure
8.	<p>Prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP and would include at a minimum:</p> <ul style="list-style-type: none"> ensuring adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised maximising safety and accessibility for pedestrians and cyclists ensuring adequate sight lines to allow for safe entry and exit from the site ensuring access to railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) managing impacts and changes to on and off street parking and requirements for any temporary replacement provision parking locations for construction workers away from stations and busy residential areas and details of how this will be monitored for compliance routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses, which should consider the haulage routes and swept path assessments as identified in the Traffic Transport and Access Impact Assessment (SLR, 2020) details for relocating taxi ranks and rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP. <p>Consultation with the relevant roads authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.</p>
9.	<p>Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.</p>
10.	<p>Road Occupancy Licences for temporary road closures would be obtained, where required.</p>
11.	<p>Relevant authorisation(s) from the appropriate road authority would be obtained for the proposed operational changes to Grandview Street, such as changes to the taxi zone and kerb modifications.</p>
12.	<p>A Road Safety Audit would be undertaken as part of detailed design and upon completion of construction, and design amendments made as required.</p>
13.	<p>Consultation would be undertaken with the NSW Taxi Council and potentially impacted bus services to consider alternate arrangements during construction</p>
	<p>Urban design, landscape and visual amenity</p>

No.	Mitigation measure
14.	<p>An Urban and Landscape Design Plan (ULDP) would be prepared by the Contractor, in consultation with Ku-ring-gai Council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The UDP, at a minimum, would address the following:</p> <ul style="list-style-type: none"> the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to: <ul style="list-style-type: none"> site analysis vision and objectives for the infrastructure strategies that apply to ISCA approved guidelines in accordance with Urb-1 (ISCA V 1.2) connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown integration with surrounding streetscape including street trees, entries, vehicle cross overs etc integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal.
15.	<p>A Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with the relevant council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The PDP, at a minimum, would address the following:</p> <ul style="list-style-type: none"> materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences location and design of pedestrian and bicycle pathways, street furniture including relocated bus and taxi facilities, bicycle storage (where relevant), telephones and lighting equipment landscape treatments and street tree planting to integrate with surrounding streetscape opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal total water management principles to be integrated into the design where considered appropriate design measures included to meet ISCA v1.2 identification of design and landscaping aspects that will be open for stakeholder input, as required.
16.	<p>All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to AS 1158 Road Lighting, AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting and AS 1428 Design for Access and Mobility.</p>
17.	<p>The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.</p>
18.	<p>Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.</p>
19.	<p>Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.</p>
20.	<p>During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.</p>
21.	<p>Light spill from the construction area 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.</p>

No.	Mitigation measure
22.	Mature trees not marked for removal should be retained through detailed design and construction as these elements have high amenity value and are able to screen the new and existing railway infrastructure. Further investigations into the opportunities for retention of the Wallangarra White Gum would be investigated during detailed design, including additional Arboricultural assessment and design / constructability optioneering.
Noise and vibration	
23.	Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the <i>Interim Construction Noise Guideline</i> (Department of Environment and Climate Change, 2009), <i>Construction Noise and Vibration Strategy</i> (TfNSW, 2019h) and the Noise and Vibration Impact Assessment for the Proposal (SLR, 2020b). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
24.	<p>The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include:</p> <ul style="list-style-type: none"> regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise 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 practicable switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded avoiding deliveries at night/evenings wherever practicable 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, no throwing of metal items and slamming of doors.
25.	<p>The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include:</p> <ul style="list-style-type: none"> maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances using the most suitable equipment necessary for the construction work at any one time 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), and for any out of hours work use of quieter and less vibration emitting construction methods where feasible and reasonable.
26.	Work would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any work outside these hours may be undertaken if approved by Transport for NSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the Transport for NSW Environment and Planning Manager for any work outside normal hours.

No.	Mitigation measure
27.	As per the <i>Construction Noise and Vibration Strategy</i> (TfNSW, 2019h), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and work of not less than one hour between each block, unless otherwise approved by Transport for NSW.
28.	Blasting, where required, would be limited to between 9am and 5pm Monday to Friday and 9am and 1pm Saturday. There would be no blasting on Sundays or public holidays.
29.	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.
30.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed work would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (SLR, 2020b) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
31.	<p>Vibration (other than from blasting) resulting from construction and received at any structure outside of the project would be managed in accordance with:</p> <ul style="list-style-type: none"> for structural damage vibration – British Standard <i>BS 7385-2:1993 Evaluation and measurement for vibration in buildings Part 2</i> and German Standard <i>DIN 4150:Part 3 – 1999: Structural Vibration in Buildings: Effects on Structures</i> for human exposure to vibration the acceptable vibration - values set out in the <i>Environmental Noise Management Assessing Vibration: A Technical Guideline</i> (Department of Environment and Conservation, 2006) which includes British Standard <i>BS 6472-2:1992 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)</i>.
32.	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory work including jack hammering and compaction for all buildings/structures/roads with a plan distance of 50 metres from the work and all heritage listed buildings and other sensitive structures within 150 metres of the work (unless otherwise determined following additional assessment they are not likely to be adversely affected).
Indigenous heritage	
33.	All construction staff would undergo an induction 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 the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.
34.	<p>If unforeseen Indigenous objects are uncovered during construction, the procedures contained in Transport for NSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 2019b) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council.</p> <p>If human remains are found, work would cease, the site secured and the NSW Police and Heritage NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.</p>
Non-Indigenous heritage	
35.	A heritage induction would be provided to workers prior to construction, 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 accordance with Section 170a of the <i>Heritage Act 1977</i> , Sydney Trains should provide notification of the work to Heritage Division 14 days prior to the commencement of the work.

No.	Mitigation measure
37.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 2019b) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and OEH. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to work recommencing at the location.
38.	Archival recording is to be undertaken of the station as a whole prior to the commencement of construction following NSW Heritage Division guidelines <i>Photographic recording of heritage items using film or digital capture</i> (NSW Heritage Office, 2006) and <i>How to prepare archival records</i> (NSW Heritage Office, 1998). Copies would be provided to the NSW Heritage Division, Ku-ring-gai Council and Sydney Trains for future reference.
39.	A suitably qualified and experienced heritage architect would be engaged to provide ongoing heritage and conservation advice throughout detailed design and any subsequent relevant design modifications. The nominated heritage architect would provide specialist advice throughout the detailed design phase to ensure that the final design adheres to the relevant strategies and the design recommendations made in the SoHI (RPS, 2020b).
40.	<p>The recommendations for the protection of significant fabric include:</p> <ul style="list-style-type: none"> the design is to include the reinstatement of the Newel posts which would require temporary removal and protection during construction where possible, impacts to landscaping must be limited protective measures, as determined in consultation with a suitably qualified heritage consultant, must be put in place to protect significant fabric on the station building. Care must be taken when installing fixtures and fittings to the exterior of the building measures must be put in place to protect significant fabric on the platform during the proposed regrading and resurfacing. Regrading of the station platform must not cover any existing wall vents on the station building. the addition of components such as seating, lighting and signage should adhere to the Sydney Trains and <i>NSW TrainLink Station Component Guide</i> (2017) and be sympathetic to existing seating, lighting and signage across the station.
41.	The assessment of archaeological potential has been limited to the Proposal area. Further assessment of the potential archaeological impacts would be required if ground disturbing work is proposed for any areas outside these locations, including at the potential lay down site within the rail corridor.
42.	Impact to known archaeological resources at the eastern end of the station platform should be avoided. Care should be taken to avoid impact during the proposed regrading and resurfacing.
43.	If required by the recommendations of the SoHI (RPS, 2020b) heritage interpretation would be planned and integrated into the detailed design of the Proposal. The heritage interpretation planning would be prepared by the heritage architect with reference to <i>Sydney Trains Heritage Interpretation Guidelines</i> . The heritage interpretation planning would be captured in a Heritage Interpretation Plan (HIP).
Socio-economic	
44.	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.
45.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.

No.	Mitigation measure
46.	A Community Liaison Management Plan would be prepared prior to construction 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 practicable.
47.	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.
48.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Management Plan to be developed prior to construction.
Biodiversity	
49.	Construction of the Proposal must be undertaken in accordance with Transport for NSW's <i>Vegetation Management (Protection and Removal) Guideline</i> (TfNSW, 2018c) and Transport for NSW's <i>Fauna Management Guideline</i> (TfNSW, 2019i).
50.	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.
51.	Under boring or excavation methods for utility installation along Grandview Street that are sympathetic toward root retention would be investigated with a suitably qualified Arborist, to explore opportunities for tree retention and protection where possible.
52.	Given the amenity value of the Wallangarra White Gum on the Pacific Highway (subject to major encroachment), the consideration for tree removal would be supported by a Level 3 internal diagnostic assessment coupled with an aerial assessment to determine the risk, respective mitigation, and useful life expectancy. The outcome of this assessment can confirm tree removal or otherwise tree retention and with design mitigation measures to reduce the impact on the root system.
53.	Installation of artificial hollows is recommended to account for the loss of those present in the Wallangarra White Gum should removal be required. This is to be in line with Council recommendations, with the number of hollows present to be confirmed at the time of felling. Design should be targeted to microchiropteran bat habitat.
54.	Offsets and/or landscaping would be undertaken in accordance with Transport for NSW's <i>Vegetation Offset Guide</i> (TfNSW, 2016b) and in consultation with the relevant council, and/or the owner of the land upon which the vegetation is to be planted. The 16 trees earmarked for removal would be offset with a minimum of 76 trees as advised in the Biodiversity Impact Assessment (RPS, 2020c). Any additional clearing would also require tree offset planting.
55.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Biodiversity Impact Assessment (RPS, 2020c) and the Arborist Assessment (Allied Tree Consultancy, 2020) 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 below.
56.	Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Arborist Assessment (Allied Tree Consultancy, 2020). Tree protection would be undertaken in line with AS 4970-2009 <i>Protection of Trees on Development Sites</i> and would include exclusion fencing of TPZs.
57.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
58.	Should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete Transport for NSW's Tree Removal Application Form and submit it to Transport for NSW for approval.

No.	Mitigation measure
59.	For new landscaping work, mulching and watering would be undertaken until plants are established.
60.	Weed control measures, consistent with Transport for NSW's <i>Weed Management and Disposal Guideline</i> (TfNSW, 2019a), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the <i>Biosecurity Act 2015</i> .
61.	For protection of native vegetation a suitably qualified Ecologist would demarcate the area to be used as laydown and clearly identify 'no go' areas to avoid and protect adjoining patches of Blue Gum High Forest located around the laydown area, prior to and during construction.
	Soils and water
62.	Prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' <i>Managing Urban Stormwater: Soils and Construction Guidelines</i> (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of work and maintained throughout construction.
63.	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the work is complete and areas are stabilised.
64.	Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area.
65.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport for NSW's <i>Chemical Storage and Spill Response Guidelines</i> (TfNSW, 2018d).
66.	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 Transport for NSW <i>Chemical Storage and Spill Response Guidelines</i> (TfNSW, 2018d) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill.
67.	In the event of a pollution incident, work would cease in the immediate vicinity and the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.
68.	The existing drainage systems would remain operational throughout the construction phase.
69.	Should groundwater be encountered during excavation work, groundwater would be managed in accordance with the requirements of the <i>Waste Classification Guidelines</i> (EPA, 2014) and Transport for NSW's <i>Water Discharge and Reuse Guideline</i> (TfNSW, 2019e).
	Air quality
70.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's <i>Air Quality Management Guideline</i> (TfNSW, 2018e).
71.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
72.	Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling.

No.	Mitigation measure
73.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
74.	<p>To minimise the generation of dust from construction activities, the following measures would be implemented:</p> <ul style="list-style-type: none">• apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)• cover stockpiles when not in use• appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading• prevent mud and dirt being tracked onto sealed road surfaces.
Waste and contamination	
75.	<p>The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum:</p> <ul style="list-style-type: none">• identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities• detail other onsite management practices such as keeping areas free of rubbish• specify controls and containment procedures for hazardous waste and asbestos waste• outline the reporting regime for collating construction waste data.
76.	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with WorkCover requirements.
77.	All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility.
78.	All spoil and waste must be classified in accordance with the <i>Waste Classification Guidelines Part 1: Classifying waste</i> (EPA, 2014) prior to disposal.
79.	Any concrete washout would be established and maintained in accordance with Transport for NSW's <i>Concrete Washout Guideline – draft</i> (TfNSW, 2019j) with details included in the CEMP and location marked on the ECM.
Sustainability, climate change and greenhouse gases	
80.	Detailed design and construction of the Proposal is to be undertaken in accordance with the ISCA Infrastructure Sustainability Rating Scheme (v1.2).
81.	The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's <i>Carbon Estimate and Reporting Tool Manual</i> (TfNSW, 2019f) or other approved modelling tools. The carbon footprint would be used to inform decision making in design and construction.
Cumulative impacts	
82.	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 in the CEMP and implemented as appropriate.

8 Conclusion

This REF has been prepared in accordance with the provisions of Section 5.5 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 and equitable access to Pymble Station for customers resulting from the installation of lifts, accessible parking and platform canopies
- improved station amenity and safety for customers at the station resulting from the installation of the family accessible toilet, unisex ambulant toilet, new lighting and CCTV
- improved safety of the pedestrian footbridge by installing new tactiles and handrails.

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

- removal of up to 16 trees for utility relocation and the installation of the new lifts, which would be offset with 76 locally endemic native species. However, further investigations would be undertaken during detailed design to determine the potential for the retention of species along Grandview Street and at the Pacific Highway station entrance
- impacts to the heritage fabric of Pymble Station for the installation of the new lifts, modifications to the Pacific Highway station entrance, and a new platform canopy
- temporary changes to pedestrian movements during construction work
- temporary changes to traffic movements as a result of the upgrade work on Grandview Street and the delivery of construction plant and materials
- temporary noise and vibration impacts during construction, with six residential receivers (apartment complexes) identified as potentially highly noise affected (with noise levels above 75 decibels) during the vegetation removal and demolition stages of construction.

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 6, Appendix A and Appendix B). 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 and Public Spaces.

The Proposal would also take into account the principles of ESD and sustainability (refer to Section 3.3.3 and Section 4.3). These would be considered 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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TfNSW, 2019g, *Guide to Environmental Controls Map*, Sydney

TfNSW, 2019h, *Construction Noise and Vibration Strategy*, Sydney

TfNSW, 2019i, *Fauna Management Guideline*, Sydney

TfNSW, 2019j, *Concrete Washout Guideline - draft*, Sydney

Appendix A Consideration of matters of National Environmental Significance

The table below demonstrates Transport for NSW'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.

Matters of NES	Impacts
Any impact on a World Heritage property? There are no World Heritage properties in the vicinity of the Proposal.	Nil
Any impact on a National Heritage place? There are no National Heritage places in the vicinity of the Proposal.	Nil
Any impact on a wetland of international importance? There are no wetlands of international importance in the vicinity of the Proposal.	Nil
Any impact on a listed threatened species or communities? One threatened flora species was detected within the Proposal area, namely Wallangarra White Gum (<i>Eucalyptus scoparia</i>). This species is listed as Endangered under the BC Act and Vulnerable under the EPBC Act, however it is a planted individual outside its natural range of occurrence (i.e. New England Tablelands) and does not form part of a viable population.	Negligible
Any impacts on listed migratory species? Due to the lack of suitable habitat, it is unlikely that the Proposal would significantly affect any listed migratory species.	Negligible
Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.	Nil
Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal	Nil
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal is for a transport facility and does not relate to coal seam gas or mining.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.	Nil

Appendix B Consideration of clause 228

The table below demonstrates Transport for NSW'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, particularly in relation to noise, traffic, access and visual amenity. Mitigation measures outlined in Section 7.2 would be implemented to manage and minimise adverse impacts.</p>	Minor adverse
<p>(b) Any transformation of a locality?</p> <p>The Proposal would include the introduction of new visible elements to the station precinct (including three new lifts and canopies) which would have a visual impact, including to the heritage setting, but which are consistent with a railway facility and would not lead to a major transformation of the locality. In addition, a range of design mitigation has been progressed to minimise impacts.</p>	Minor adverse
<p>(c) Any environmental impact on the ecosystem of the locality?</p> <p>Up to 16 trees are proposed to be removed. The removal of these trees is not considered to have an impact on the overall ecological values of the areas as it would not result in the loss of a naturally occurring Plant Community Type. Offset plantings of 76 trees would be carried out as per the <i>TfNSW Vegetation Offset Guide</i>.</p>	Minor adverse
<p>(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</p> <p>The Proposal would include the introduction of new visible elements to the station precinct (including a new lifts, station entrances, and canopies) which would have a visual impact but not a major impact on the landscape character of the locality</p>	Moderate adverse
<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 be a positive contribution to the area as it provides equitable access to the station platform and improves amenity of the station for all customers.</p> <p>The station is listed on RailCorp's Section 170 Heritage and Conservation Register. The Proposal would result in some impacts to some parts of the station that are heritage listed. Impacts to heritage would be minimised through the implementation of the mitigation measures provided in the SoHI and REF.</p> <p>A desktop archaeological assessment has been undertaken which determined that there is a low risk of encountering archaeological items/deposits within the Proposal area. Further assessment of the potential archaeological impacts would be required if ground disturbing work is proposed for any areas not already assessed as part of the SoHI and REF including at the construction lay down off Grandview Street.</p>	Moderate adverse

Factor	Impacts
<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 would not have any impact on habit 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. One threatened flora species was detected within the Proposal area, namely Wallangarra White Gum (<i>Eucalyptus scoparia</i>). This species is listed as Endangered under the BC Act and Vulnerable under the EPBC Act, however it is a planted individual outside its natural range of occurrence (i.e. New England Tablelands) and does not form part of a viable population.</p>	Minor adverse
<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>	Negligible
<p>(i) Any degradation of the quality of the environment?</p> <p>The Proposal is unlikely to have any degradation of 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. Specific management measures would be implemented to manage asbestos and other hazardous materials that may be encountered during construction or demolition work.</p>	Minor adverse
<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 of the environment provided the recommended mitigation measures are implemented.</p>	Negligible
<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 prepared as part of the Construction Environmental Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.</p>	Minor
<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 to increase demands on resources that are, or are likely to become, in short supply.</p>	Nil

Factor	Impacts
<p>(o) Any cumulative environmental effect with other existing or likely future activities?</p> <p>Cumulative effects of the Proposal are described in Section 6.15, Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.</p>	Negligible
<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

