NSW GOVERNMENT

Transport Access Program
Waratah Station Upgrade
Review of Environmental Factors

Artist's impression of Waratah Station Upgrade, indicative only, subject to detailed design

November 2018

Waratah Station Upgrade Review of Environmental Factors

Transport Access Program
Ref – 6166340

Contents

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Abbreviations

Term	Meaning
ABPs	Assisted Boarding Points
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
APS	Access to Premises (Disability Standards)
ARI	Average Recurrence Interval
ASA	Asset Standards Authority (refer to Definitions)
ARTC	Australian Rail Track Corporation
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CBD	Central Business District
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CNVMP	Construction Noise and Vibration Management Plan
CNVS	*Construction Noise and Vibration Strategy* (TFNSW, 2018)
CPTED	Crime Prevention Through Environmental Design
dBA	A-weighted decibel
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
D&C	Design & Construct
DDA	*Disability Discrimination Act 1992* (Cwlth)
DoE	Commonwealth Department of the Environment
DP&E	NSW Department of Planning and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
DSI	Detailed Site Investigation (Phase 2 Contamination Investigation)

Term	Meaning
ECM	Environmental Controls Map
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
ETS	Electronic Ticketing System
FAT	Family Accessible Toilet
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
HV	High Voltage
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
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
NML	Noise management level
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	NSW Office of the Environment and Heritage
OHWS	Overhead Wire Structure

Term	Meaning
OOHW	Out of hours works
PA system	Public Address system
PDP	Public Domain Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
RailCorp	(former) Rail Corporation of NSW
RAP	Remediation Action Plan
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
Roads and Maritime	NSW Roads and Maritime Services (formerly Roads and Traffic Authority)
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
SSER	Station Services Equipment Room
TCP	Traffic Control Plan
TfNSW	Transport for NSW
TGSI	Tactile Ground Surface Indicators (“tactiles”)
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
TVM	Ticket Vending Machine
UDP	Urban Design Plan
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)

Definitions

Term	Meaning
Average Recurrence Interval	The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Asset Standards Authority	The ASA is an independent body within TfNSW, responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets. Design Authority functions formerly performed by RailCorp are now exercised by ASA.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Construction Contractor (should the Proposal proceed) to a design suitable for construction (subject to TfNSW acceptance).
Design and Construct Contract	A method to deliver a project in which the design and construction services are contracted by a single entity known as the Construction Contractor. The Construction Contractor completes the project by refining the concept design presented in the REF and completing the detailed design so that it is suitable for construction (subject to TfNSW acceptance). The Construction Contractor is therefore responsible for all work on the project, both design and construction.
Detailed design	Detailed design broadly refers to the process that the Construction Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to TfNSW acceptance).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (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).

Term	Meaning
NSW TrainLink	From 1 July 2013, NSW Trains (NSW TrainLink) became the new rail provider of services for regional rail customers.
Opal card	The integrated ticketing smartcard introduced by TfNSW.
Out of hours works	Defined as works *outside* 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, TfNSW.
Rail possession	Possession 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.
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 Waratah Station Upgrade.
Vegetation Offset Guide	The TfNSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act. 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.

Executive summary

Overview

The NSW Government is improving accessibility at Waratah 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 Waratah 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 aim to provide:

- a new access ramp and stairs from Platt Street to Platform 2
- three new lifts connecting to the existing footbridge
- a new elevated walkway connecting the proposed lift on Platform 1 to the existing footbridge
- works to the existing station building including a new Family Accessible Toilet and a new unisex ambulant toilet
- refurbishment works to the existing footbridge and stairs
- localised platform widening and regrading
- lighting and security upgrades
- transport interchange works including a new accessible parking space on Platt Street, and improved kiss and ride facilities

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 the environmental impacts associated with 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 2019 and take around 18 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF and an indicative representation of the features of the Proposal is provided in Figure 1.

Need for the Proposal

The Proposal would ensure that Waratah Station would meet legislative requirements under the Commonwealth *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.

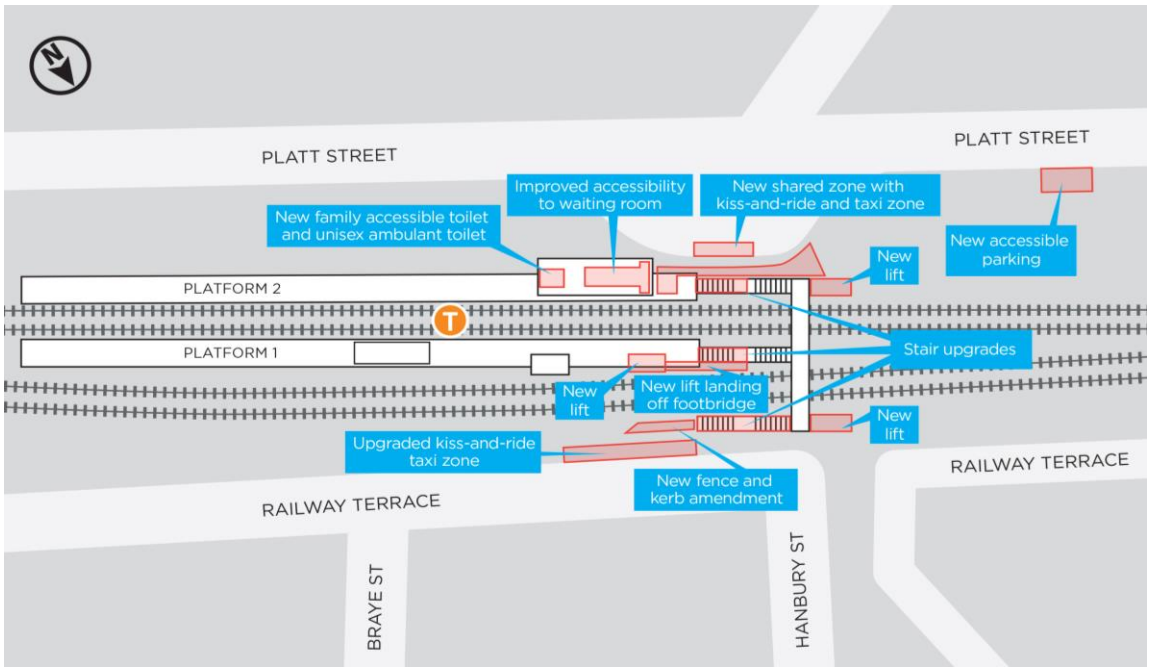

Figure 1 The Proposal

Community and stakeholder consultation

Community consultation activities for the Proposal would be undertaken during the public display period of this REF and 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 and information on submitting feedback is provided on the following page. Further information about these specific activities is included in Section 4.5 of this REF.

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

TfNSW would review and assess all feedback received during the public display period, prior to determining whether or not to proceed with the Proposal. Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure 2 shows the planning approval and consultation process for the Proposal.

Feedback can be sent to:

- projects@transport.nsw.gov.au
- Transport Access Program – Waratah
  Associate Director Environmental Impact Assessment
  Transport for NSW
  Locked Bag 6501
  St Leonards NSW 2065

Or submitted:

- in person at a project community information stall
- via yoursay.transport.nsw.gov.au/Waratah

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 following key impacts have been identified should the Proposal proceed:

- temporary changes to vehicle and pedestrian movements to, from and around the station during construction. These minor impacts would be managed by the implementation of a Construction Traffic Management Plan
- impacts to the visual character of Waratah Station due to the installation of three lifts and the elevated walkway associated with the accessible path to Platform 2
- removal of two mature trees adjacent to the proposed lift on Railway Terrace
- temporary noise and vibration impacts during 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 TfNSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

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 Indicative view of the Proposal from Railway Terrace

1 Introduction

Transport for NSW (TfNSW) was established in 2011 as the lead agency for integrated delivery of public transport services across all modes of transport in NSW. TfNSW is the proponent for the Waratah Station Upgrade (the Proposal), to be delivered by the Infrastructure and Place Division.

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

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

Waratah Station access does not currently meet key requirements of the *Disability Standards for Accessible Public Transport* (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA).

Stairs to the platform currently provide the only means of access to the footbridge and the station platform. These do not provide an accessible path of travel for people with a disability or reduced mobility, parents/carers with prams or customers with luggage. There is currently no family accessible toilet for customers using the station and there are issues with interchange parking facilities, and bus stop seating.

The Proposal would provide safe and equitable access to the station platforms, interchange parking and to the interchange network surrounding the station. Customer facilities and amenity would also be improved. The improvements would assist in supporting future growth in public transport use and would provide an improved customer experience for existing and future users of the station.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- installation of a new access ramp and stairs from Platt Street to Platform 2
- installation of three new lifts connecting to the existing footbridge, with canopies for weather protection at the waiting areas
- installation of a new elevated walkway connecting the lift on Platform 1 to the existing footbridge, and localised widening of Platform 1 at the lift location
- refurbishment works to the existing footbridge including: replacement of stair treads and handrails, provision for TGSIs and localised strengthening, repairs and repainting
- works to the existing station building including: provision of a new Family Accessible Toilet (FAT) and a new unisex ambulant toilet (to replace existing male and female toilets), works to make the waiting room accessible and work to provide a new Station Services Equipment Room (SSER) including extension of the building,
- platform works including localised regrading for accessible paths of travel, platform resurfacing and repairs where impacted by construction activities, adjustment to seating and other facilities on the platforms, and TGSI adjustments including for the stairways
- ancillary works including:
    - protection or relocation of services and utilities to accommodate the new works

    - upgrade to the station power supply to cater for the new lifts
    - lighting upgrades required for the new work
    - improvement to station security and communication systems, including CCTV upgrade, public address system and new hearing induction loops within the station platforms)
- modifications to wayfinding and other signage
- transport interchange works including:
    - a new accessible parking space on Platt Street
    - upgrade work to provide improved kiss and ride facilities on Platt Street
    - upgrade work to provide improved kiss and ride facilities on Railway Terrace, incorporating the existing taxi zone
    - new bus stop seating in Platt Street and Hanbury Street; and
    - new bicycle racks at the Platt Street station entrance (to replace the existing facility).

Subject to planning approval, construction is expected to commence in early 2019 and take around 18 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

Waratah Station is within the Newcastle local government area (LGA) in the Hunter Region of NSW (as shown in Figure 4), 165 kilometres north of the Sydney Central Business District (CBD). The station is located on Railway Terrace / Platt Street, Waratah (Figure 5) which connects to Station Street to the south-west and Hanbury Street to the north-east.

Waratah Station is on the Hunter Line two stops north of Newcastle Interchange. Based on 2017 patronage data, Waratah Station has an average number of 334 trips recorded on a typical weekday.

Only one side of Platform 1 (western side) is used by station customers. The rear of the platform has a fence segregating the adjacent rail lines which are used for freight.

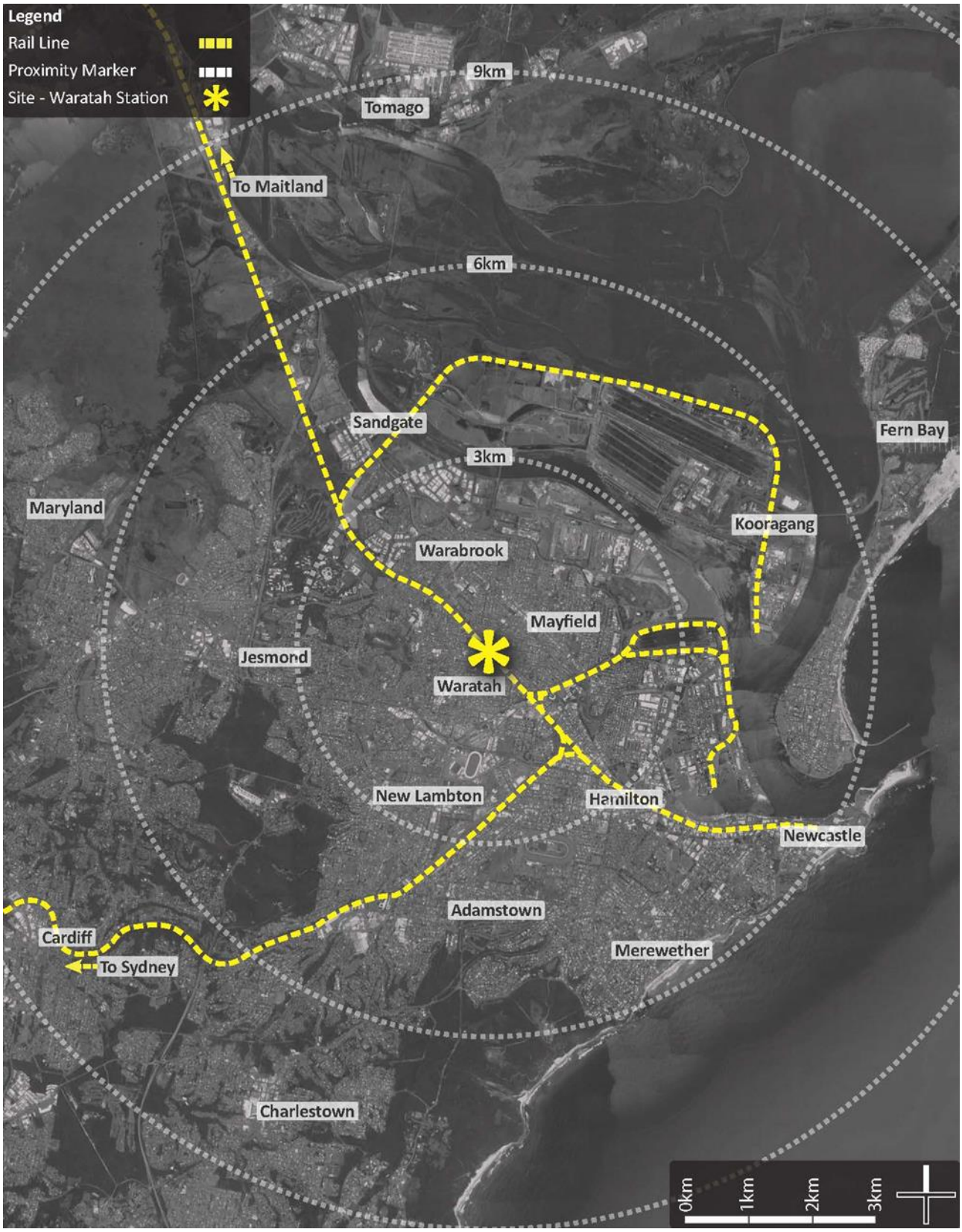

Figure 4 Regional context

1.3 Existing infrastructure and land uses

The station comprises of two platforms with the main station building and facilities located on the southern side which adjoins Platt Street (Platform 2). The second platform is an island platform (Platform 1) which includes a smaller station building as well as canopied waiting area. There are two other train lines to the south of Platform 2 which are used by freight and other local industries – these lines are not part of this project.

A footbridge is located on the western side of the station. The three flights of stairs connect each platform as well as providing access to the station from Railway Terrace on the northern side.

The adjoining area is mainly residential. There are several commercial premises on Hanbury Street to the north of the station which include a café, beauty salon and car rental. To the south of the station there is a day care centre (corner of Platt and Station Streets) and Waratah Park which includes Waratah Oval.

Figure 5 shows the location of the Proposal, corresponding land use and nearby receivers.

General access to Platform 2 (southern side) is via stairs adjacent to the passenger drop off on Platt Street which allows access to the western end of the platform. The stairs to the footbridge are immediately adjacent to this (western end of platform) allowing access to Platform 1 and Railway Terrace.

There are extensive footpaths on approach to the station from the southern side of the station which includes a combined pedestrian and cycle path on the northern side of Pratt Street. This combined path then crosses to the southern side of Pratt Street at the traffic lighted pedestrian crossing to the front of the station – joining to other cycle paths to continue to south and east.

On the northern side of the station, there is a pedestrian path immediately adjacent to the stairs of the footbridge allowing access to the taxi rank as well as Hanbury and York Streets.

There is a bus stop and cycle facilities (for approximately seven bikes) on the southern side of the station. A footpath is also evident on the northern side of Railway Terrace - some of which is a combined pedestrian and cycle path. There is a pedestrian crossing on the northern side of the station adjacent to the footbridge landing which allows access to the combined commercial and residential areas to the north.

A taxi zone is located on the northern side of the station at the intersection of Railway Terrace and Hanbury Street.

There is no dedicated commuter parking associated with this station. Parking is on adjoining roads which are generally unrestricted parking.

Figure 5 Proposal location

Figure 6 Waratah Station from Hanbury Street

Figure 7 Waratah Station main station building

Figure 8 Waratah Station viewed from Railway Terrace showing stairs to Platform 2

Figure 9 Footbridge seen from Railway Terrace

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by TfNSW to assess the potential impacts of the Waratah Station Upgrade. For the purpose of these works, TfNSW 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* (the 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 Environment 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 with, 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

2.1.1 Overview

The Waratah Station Upgrade, the subject of this REF, forms part of the Transport Access Program which is an initiative to provide a better experience for public transport customers by delivering accessible, secure and integrated transport infrastructure.

The Proposal would improve accessibility of the station in line with the requirements of the *Disability Discrimination Act 1992* (DDA) (Commonwealth) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT). Alignment with other key strategies is discussed below.

In September 2015, the NSW Government announced a series of State Priorities as part of *NSW: Making It Happen* (NSW Government, 2015). The State Priorities are intended to guide the ongoing actions of the NSW Government across the State, and guide resource allocation and investment in conjunction with the NSW Budget. *NSW: Making it Happen* focuses on 12 key 'priorities' to achieve the NSW Government's commitments. These priorities range across a number of issues including infrastructure, the environment, education, health, wellbeing and safety in addition to Government services.

One of the 12 priorities identified as part of *NSW: Making It Happen* relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority. The Proposal assists in meeting the priority by improving accessibility to, and encouraging greater use of, public transport.

The NSW Government has developed a transport strategy *Future Transport 2056* (TfNSW 2018a). *Future Transport 2056* is an overarching strategy, supported by a suite of plans to achieve a 40-year vision for transport in NSW. The strategy outlines six state-wide transport outcomes and they are:

- customer focused
- successful places
- a strong economy
- safety and performance
- accessible services
- sustainable.

The Transport Access Program contributes to the accessible services, safety and performance and customer focused outcomes.

TfNSW forecasts a 12 percent increase in train patronage at Waratah Station up to 2036. It is anticipated that improved accessibility to the station will encourage increased use of public transport in the area.

The *Disability Action Plan 2018-2022* (TfNSW, 2017e) was developed by TfNSW, in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Plan discusses

the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provides a solid and practical foundation for future progress over the next five years. The Proposal has been developed in consideration of the objectives outlined in this Plan.

Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal. Further details of the application of NSW Government policies and strategies are discussed in Section 4.5 of this REF.

2.1.2 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 where it is needed most. The program aims to provide:

- a station that is accessible to people with a disability, limited mobility and parents with prams
- buildings and facilities for all modes that meet the needs of a growing population
- interchanges that support an integrated network and allow seamless transfers between all modes for all customers.

2.1.3 Objectives of the Proposal

The specific objectives of the Waratah Station Upgrade are to:

- provide a station that is accessible to people with a disability, limited mobility and parents with prams
- improve customer experience and amenity by providing better interchange facilities such as an enhanced kiss and ride areas on both sides of the station and upgraded toilet facilities
- improve integration with the surrounding precinct by providing accessible paths of travel from Platt Street, Railway Terrace and Hanbury Street within the immediate area of the interchange
- improve customer accessibility and safety through CCTV, lighting, and stair upgrades
- improve wayfinding in and around the station.

2.2 Design development

TfNSW has developed an initial concept design for the Waratah Station Upgrade that would improve accessibility in and around the station and meet key architectural, engineering and urban design objectives.

The development of the initial concept design involved several key tasks, including a performance assessment of the existing station and surrounding precinct elements and identification of key deficiencies and opportunities for improving accessibility and amenity. The assessment identified the following deficiencies with the existing station and the surrounding precinct:

- stair only access
- lack of accessible car parking
- lack of tactile ground surface indicators on existing stairs and footbridge

- lack of a Family Accessible Toilet and ambulant facilities
- lack of assisted boarding points (ABPs)
- non-compliant accessible seating
- lack of formal kiss and ride areas
- under-utilised taxi zone.

The needs and opportunities at Waratah Station were then considered in the development of options for the concept design with the preferred option to be further refined during the detailed design phase.

2.3 Options considered

Options for improving access to Waratah Station were developed to address accessibility needs and other design principles.

Two options were developed in addition to the do-nothing option. Improvements common to both options included the installation of three lifts, installation of a new Family Accessible Toilet and ambulant toilet and provision of designated assisted boarding points (ABPs).

The key differences in each option considered are summarised as follows:

- Option 1: new footbridge
- Option 2: modifications to existing footbridge.

2.3.1 The 'do-nothing' option

Under a 'do-nothing' option, existing access to the platforms, station and facilities, footbridge and car parking would remain the same and therefore the accessibility restraints would be still present, thus limiting which customers are able to use the station.

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

The 'do-nothing' option was not considered a feasible alternative as it would not meet the requirements of the DDA and DSAPT. A 'do nothing' option would not encourage the use of public transport or meet the current and future needs of the Waratah community.

2.3.2 Assessment of identified options

The design options were assessed in a multi-criteria analysis (MCA) that included consideration of factors such as customer experience, accessibility, engineering constraints, environmental constraints, heritage listing, modal integration and cost to select a preferred option.

2.4 Justification for the preferred option

Assessment of the two options was based on a multi-criteria analysis (MCA) undertaken with the key internal stakeholders. The assessment of options was informed by a workshop and with reference to relevant standards and guidelines.

Key considerations identified in the MCA were:

- Option 2 has a similar impact to Option 1, however was likely to have less impact on the existing underground services running through the rail corridor in close vicinity to the existing footbridge
- Option 2 provides additional accessible path works on the northern entry to the station
- a new footbridge (Option 1) is likely to be more visually intrusive, given that there are currently no overhead power line structures in this location
- although Option 2 still has requirements to modify the footbridge, it is likely to be less complex than new footbridge works associated with Option 1
- Option 1 would increase interchange distance between platforms and bus stops as Option 2 generally utilises existing entrances.

Based on the MCA, Option 2 was selected as the preferred option as it would achieve a better outcome for the Waratah precinct by enhancing accessibility for all customers while acknowledging existing environmental constraints. This option would also achieve integration with the existing footbridge, helping to maintain the character of the area, has reduced vegetation impacts and less construction waste when compared with Option 1. In addition, the overall construction time would be shorter for this option, with an associated reduction in temporary community impacts such as noise and access and fewer rail possessions.

3 Description of the Proposal

Chapter 3 describes the Proposal and summarises key design parameters, construction method, and associated infrastructure and activities. The description of the Proposal is based on the concept design and is subject to detailed design.

3.1 The Proposal

As described in Section 1.1, the Proposal involves an upgrade of Waratah Station as part of the Transport Access Program which would improve accessibility and amenities for customers.

The Proposal would include the following key elements:

- installation of a new access ramp and stairs from Platt Street to Platform 2
- installation of three new lifts connecting to the existing footbridge, with canopies for weather protection at the waiting areas
- installation of a new elevated walkway connecting the lift on Platform 1 to the existing footbridge, and localised widening of Platform 1 at the lift location
- refurbishment works to the existing footbridge
- works to the existing station building including: provision of a new Family Accessible Toilet (FAT) and a new unisex ambulant toilet, works to make the waiting room accessible and work to provide a new Station Services Equipment Room (SSER) including extension of the building
- platform works including localised regrading for accessible paths of travel
- ancillary works including:
    - protection or relocation of services and utilities to accommodate the new works
    - upgrade to the station power supply to cater for the new lifts
    - lighting upgrades required for the new work
    - improvement to station security and communication systems (including CCTV upgrade, public address system and new hearing induction loops within the station platforms
- modifications to wayfinding and other signage
- transport interchange works.

Figure 10 shows the general layout of key elements for the Proposal. Figure 11 shows the proposed changes to the station building. Figure 12 shows the proposed location of the construction compound.

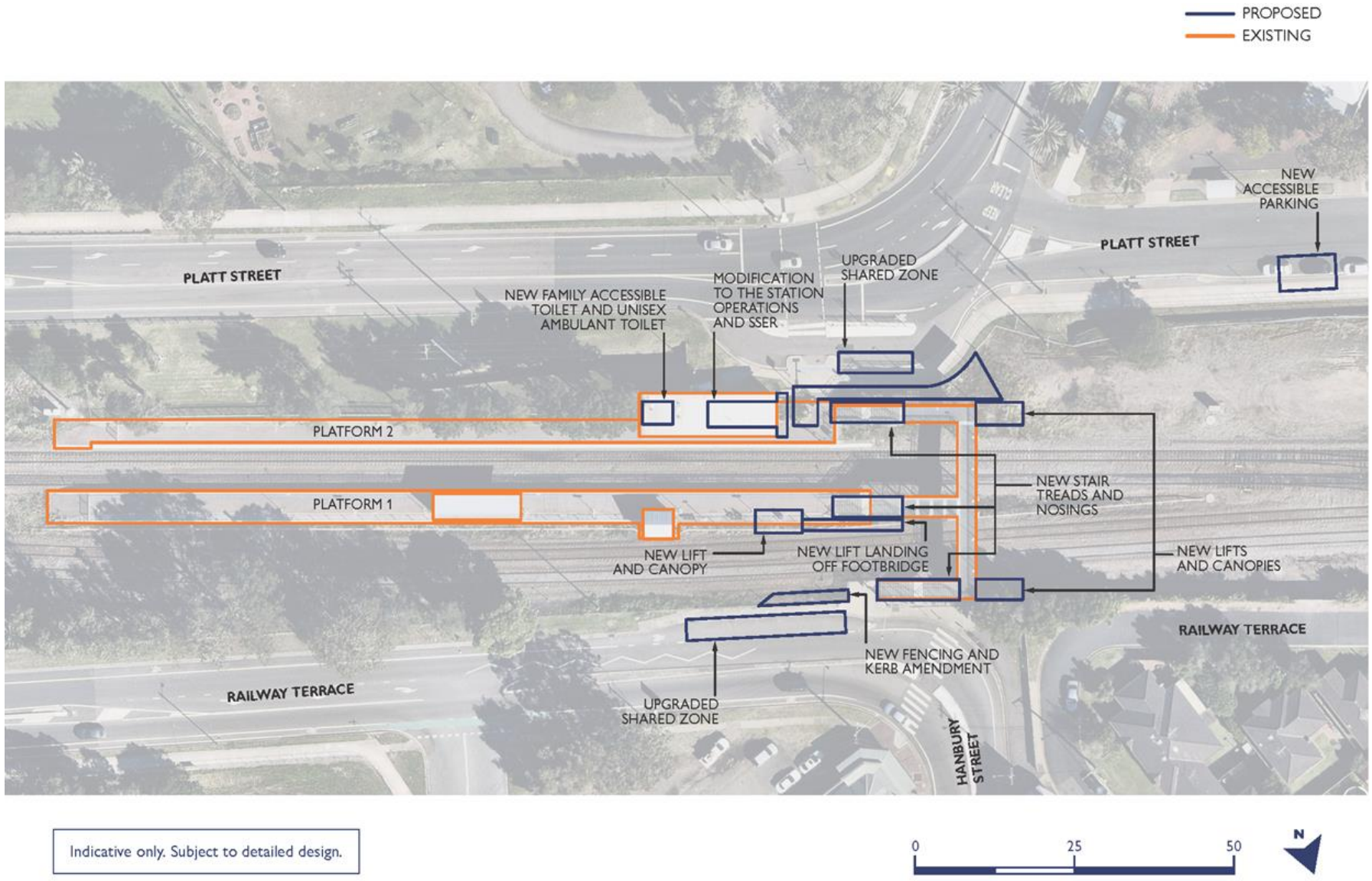

Figure 10 Key elements of the Proposal

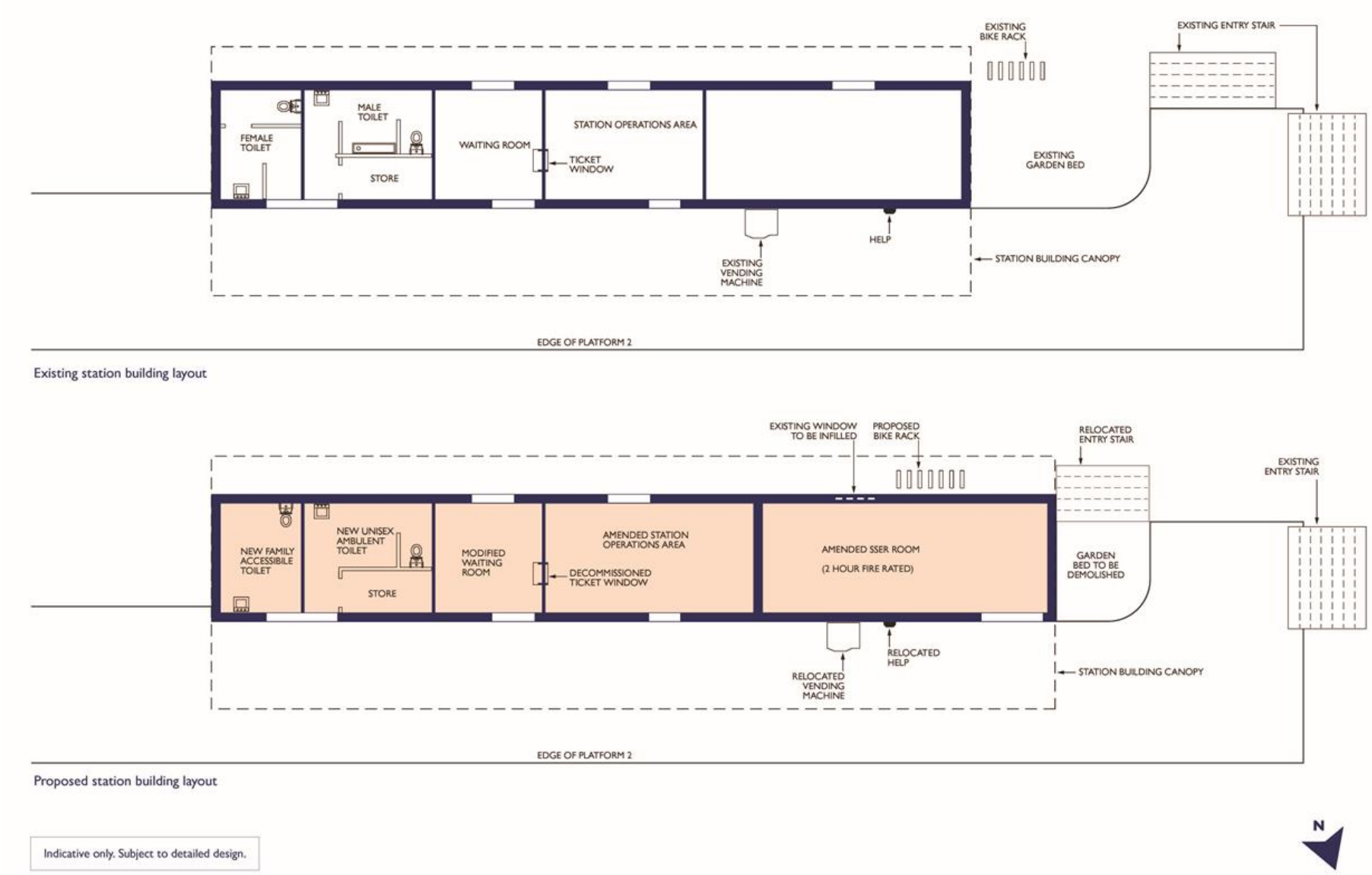

Figure 11 Existing and proposed station building layout

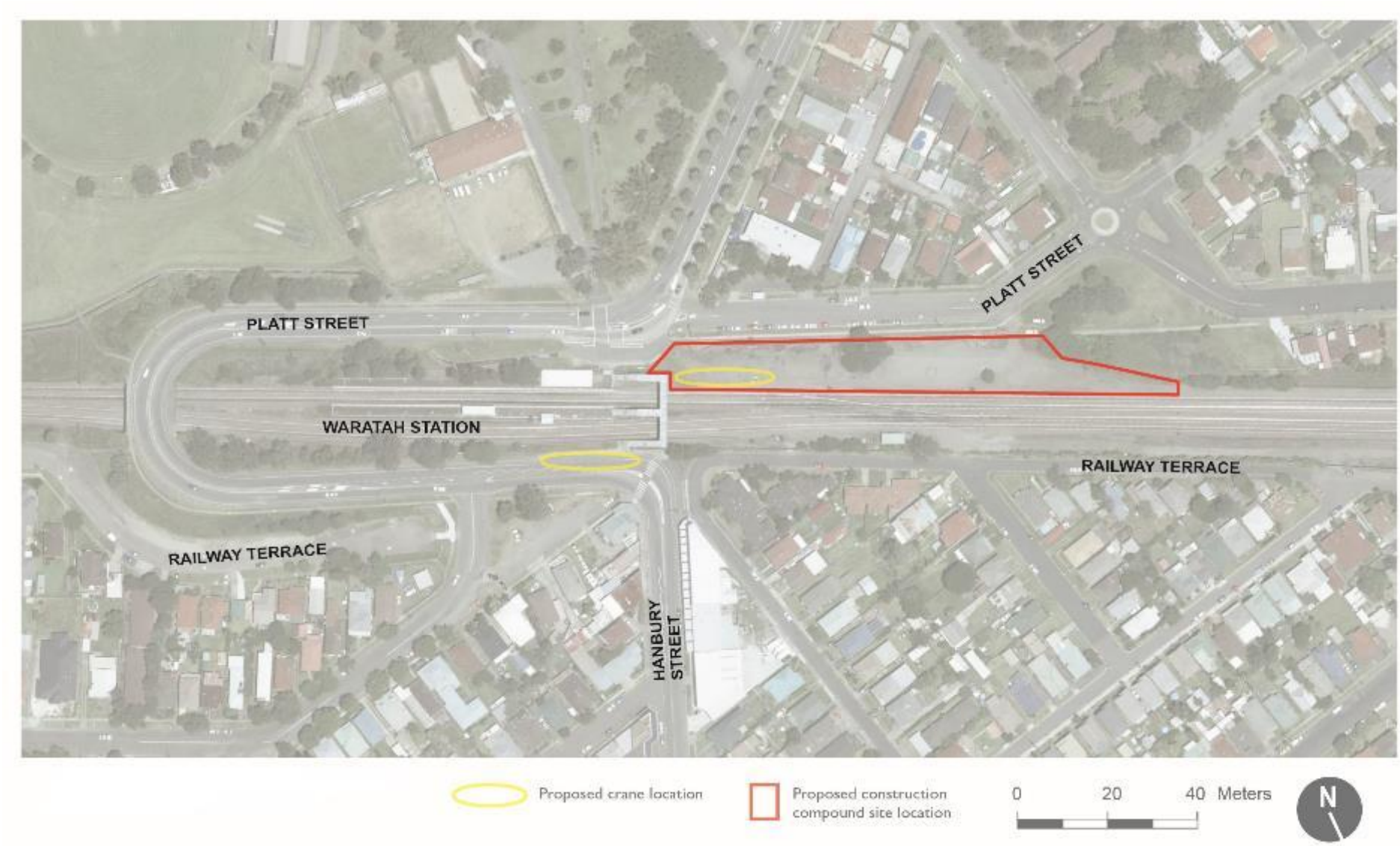

Figure 12 Proposed construction compound location and crane locations

3.1.1 Scope of works

Station upgrade

Works proposed to take place at the station to facilitate improved accessibility are:

- installation of a new access ramp and stairs from Platt Street to Platform 2, which would involve removal of the existing garden beds, and relocation or adjustment to the existing billboards
- installation of three new lifts connecting to the existing footbridge, which would include:
    - tree removal and modifications to the existing noise wall to accommodate the lift at Hanbury Street
    - piled foundations, lift pit construction, and lift shaft installation
    - lift landings with canopies for weather protection at the waiting areas along with screens or balustrades
    - electrical and communications services installation for the lifts
    - lift car installation
- installation of a new elevated walkway connecting the lift on Platform 1 to the existing footbridge with balustrades, and localised widening of Platform 1 at the lift location
- refurbishment and other works to the existing footbridge including:
    - replacement of stair treads and handrails
    - work to the footbridge walkway including provision for TGSIs
    - works to strengthen the existing trestle columns and footings where providing support for the new elevated walkway
    - other localised strengthening, repairs and repainting work
    - works to provide fire protection to supports for the new elevated walkway
    - additional containment lines and cabling installation for power and communications associated with the new lifts, and station services upgrades including upgrades to the station lighting, CCTV, PA system and hearing induction loops
- works to the existing station building including:
    - construction of a new Family Accessible Toilet (FAT) with baby change table, and a new unisex ambulant toilet (to replace existing male and female toilets)
    - works to make the waiting room accessible, including removal of the door threshold by lowering the floor, removal of the front wall, and modification to the seating to provide space for wheelchair users
    - provision of a new Station Services Equipment Room (SSER) which would house the station communications and electrical equipment. The building works would include extension of the existing building, existing internal wall demolition, new internal wall construction, and works to provide the required fire resistance. Services would include power, lighting, air conditioning, electronic access control and an intruder alarm system
    - relocation of equipment into the new SSER and reconfiguration of the station office including required building works, furniture adjustment, services and finishes
    - decommissioning of the former ticket window

- platform works including:
    - localised regrading for accessible paths of travel
    - platform resurfacing and repairs where impacted by installation of hearing induction loops and other construction activities
    - adjustment to seating, rubbish bins and other facilities on the platforms
    - TGSI installation, including reinstatement and new TGSI for the stairways and line marking
- ancillary works including:
    - protection or relocation of services and utilities to accommodate the new works
    - upgrade to the station power supply to cater for the new lifts, including work to interface with the Ausgrid power supply infrastructure
    - lighting upgrades required for the new work
    - improvement to station security and communication systems, including CCTV upgrade, PA system upgrades, additional opal card readers and new hearing induction loops within the station platforms
    - drainage modification works
    - fencing adjustments
    - modifications to wayfinding and other signage.

Interchange facilities

Interchange facility works proposed are:

- a new accessible parking space on Platt Street, including pavement cross falls adjustment (where required), line marking, signage, new kerb ramp and kerb adjustments
- provision of an access path from the station entrance between Platt Street, the lower lift landing on Platform 2, and the new accessible parking space
- upgrade work including footpath adjustments, new kerb ramps and signage to provide improved kiss and ride facilities on Railway Terrace to the east, and Platt Street to the west of the station
- installation of new DSAPT compliant bus stop seating on Hanbury Street and Platt Street
- provision of six new bicycle hoops on Platt Street, adjacent to the station entrance
- local adjustments to the rail corridor fencing on Railway Terrace to accommodate the improved kiss and ride facility.

Indicative external materials and finishes

The external materials and finishes for the Proposal have been selected based on the criteria of durability, low maintenance and cost effectiveness, to accord with existing building fabric, to minimise visual impacts, and to be aesthetically pleasing. Materials have been chosen to align with the building's existing character.

Availability and constructability are also important criteria to ensure that materials are readily available and the structure can be built with ease and efficiency. 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:

- lift shafts – steel structure, precast concrete, aluminium louvres and glass
- elevated walkway – steel girders with a composite reinforced concrete supported off the lift shaft and cantilever support beams connecting to the existing steel trestle pier
- concourse and pedestrian footbridge – concrete base
- platform stairs – concrete and non-slip tread
- lift waiting area canopies – steel frame and steel roof sheeting.

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

3.1.2 Engineering constraints

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

Existing structures: the accessibility, placement and integrity of existing structures has been considered during the development of the design - these structures included the existing platforms, footbridge, footpaths, and stairs and station building.

Sydney Trains and ARTC requirements: modifications for existing structures and new 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.

Other considerations:

Underground services: Underground services within the vicinity of the station and crossing the rail corridor that have influenced scope include Signalling, Telstra fibre optic, NBN Co Fibre Optic, Jemena gas mains, Water mains and sewer and stormwater infrastructure. Further services identification and location work in the field using non-destructive digging and potholing would be undertaken to inform the detailed design phase, and scope for any services adjustment or protection that may be required.

Overhead services: Aerial 33 kV power lines are close to the station which may require protection and or isolation during the works. The concept design (in particular the location of the lift at the Platt Street entrance) has been developed in consideration of these services and would require further consideration during the detailed design, construction and operation of the proposal.

Construction access: Construction access will require traffic control in the adjacent streets and use of a large mobile crane would be required to lift construction materials and equipment to the station from these roadways on specified days.

Public access: Maintaining pedestrian access to the station and across the rail corridor during construction.

3.1.3 Design standards

The Proposal would be designed with regard to the following:

- *Disability Standards for Accessible Public Transport 2002* (issued under the Commonwealth *Disability Discrimination Act 1992*)
- Building Code of Australia / National Construction Code
- relevant Australian Standards
- Asset Standards Authority standards
- Sydney Trains standards
- *NSW Sustainable Design Guidelines – Version 4.*0 (TfNSW, 2017)
- Infrastructure Sustainability Council of Australia (ISCA) *Infrastructure Sustainability (IS) 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 TfNSW policies and guidelines
- relevant council standards.

3.1.4 Sustainability in design

TfNSW is committed to minimising the impact on the natural environment and supports the Infrastructure Sustainability Council of Australia (ISCA) and its 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.

The Waratah Station Upgrade is one of a number of projects within the Transport Access Program will be using version 1.2 of the IS rating tool, and is targeting an 'Excellent' rating. This requires the achievement of between 50 and 75 points out of a possible 100. 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 TfNSW Environmental Management System (EMS) and the *NSW Sustainable Design Guidelines - Version 4.0* (TfNSW, 2017). Key design elements and strategies developed during scoping design will be used to facilitate achievement of the 'Excellent' target rating.

3.1.5 Work methodology

Subject to approval, construction is expected to commence in early 2019 and take around 18 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Construction Contractor in consultation with TfNSW.

The indicative construction activities for the Proposal are identified in Table 1. This staging is indicative and is based on the current concept design so may change once the detailed design methodology is finalised. The staging is also dependent on the Construction Contractor's preferred methodology, program and sequencing of work to minimise the overall construction

duration and the available track possessions. Indicative works locations are shown in Figure 12.

Table 1 Indicative construction staging for key activities

Stage	Activities
Site Investigations (Pre-detailed design)	• Surveying • Potholing / non-destructive digging to confirm underground services location • Condition assessments / inspect pits by suitably experienced personnel when excavation works are occurring, etc • Geotechnical boreholes and other site investigations
Site Establishment & Enabling Works	• Site establishment – install site sheds / amenities and services connection and demarcation fencing • Remove billboards / adjust fencing • Modifications to noise wall and install temporary acoustic screens (Railway Terrace side) • Install platform / site demarcation fencing and hoardings • Install temporary concrete pump line • Tree removal / vegetation trimming • Services protection / relocation (incl. signalling in GST) • Services diversion / relocation works including in platforms (if required)
Footbridge, Stairs, Lifts & Ramps	• Repair / strengthen / patch paint existing footbridge / stairs • Construct lift pits / foundations / lift bases (behind hoardings) • Install lift shafts and upper lift landing • Install elevated walkway cantilever beams, stringers and precast deck slabs (with temporary balustrades) • Install elevated walkway protection screens and external finishes • Construct new ramp to Platform 2 and modifications to stairs • Install services containment to elevated walkway • Install lift shaft services, lift cars and fit out lift cars • Install lighting / CCTV / PA services to elevated walkway and lift landings • Replace stair treads and hand railing (out of hours work)
Building & Platform Works	• Construct foundations / retaining structure for local platform widening • Install select fill material / concrete for local platform widening • Construct combined services route for power /communications to new station services equipment room / switch room • Building works and services / fit out for new FAT, ambulant toilet and waiting room • Construct new station services equipment room / switch room • Building services / fit out and equipment installation for new station services equipment room / switch room • ‘Make good’ existing station building following removal of communications equipment / racks. • Platform re-grading/resurfacing, TGSI and hearing loops • Platform finishing works (reinstatement / resurfacing, line marking etc.)

Stage	Activities
Interchange Works, Finalisation, & Site demobilisation	• Test and commission new station power supply • Interchange works including civil/lighting (as required) • Cutover / commission digital PA / hearing induction loops • Test and commission CCTV cameras / station systems installation • Test and commission new lifts / open to public • Finishing works including landscaping, fencing • Site demobilisation

3.1.6 Plant and equipment

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

- trucks (various types and sizes e.g. suction/ vacuum trucks)
- jack hammer
- chainsaw
- mulcher
- piling rig/drill rig
- franna / mobile cranes (75 up to 300 tonnes)
- bobcat
- excavator
- demolition saw
- hydraulic saw/rock saw/concrete saw/ tile cutter
- concrete grinder
- concrete pump
- concrete truck
- concrete vibrator
- mixer for screeding
- lighting tower
- coring machine
- water cart
- hi rail plant (e.g. rail mounted elevated work platform/flatbed/ hi ab and crane etc)
- road based elevated work platform and boom lifts
- forklift
- pallet jack
- vibrating roller /compaction plate
- hand tools
- bar bender
- power tools (e.g. drill, hammer drill, core drill, saws, torque, impact wrenches and grinders)

3.1.7 Working hours

Most of the works would be undertaken during standard construction hours, which are as follows:

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

Certain works may need to occur outside standard hours and would include night works and works during track possessions (which are routine scheduled closures that would occur regardless of the Proposal, when part of the rail network is temporarily closed and trains are not operating). A number of these track possessions would take place on weekends as well as on weekdays, and for the Hunter Line range typically from 48 to 96 hours in duration.

Out of hours works are 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. It is estimated that no less than five track possessions would be required to facilitate certain activities throughout the project duration.

Out of hours works may also be scheduled outside rail shutdown periods. Approval from TfNSW would be required for any out of hours work and the affected community would be notified as outlined in TfNSW's *Construction Noise and Vibration Strategy* (TfNSW, 2018b) Works that are likely to require out of hours works may include:

- delivery of oversized loads to the site such as construction plant and portable construction compound buildings, lift shaft components, steel beams, and precast deck elements
- construction activities involving crane setups on Railway Terrace such as lift shaft construction at Railway Terrace / Hanbury Street junction.
- works to upgrade the existing footbridge (e.g. replace stair treads and hand railing for the street access stairways)
- interchange works that may impact on traffic flow if lane closures are required.

3.1.8 Earthworks

Excavations and earthworks would generally be required for the following:

- the foundations for the lifts (subject to ground conditions)
- excavation for the lift pits
- foundations for localised platform widening work for Platform 1 lift
- foundations for the proposed ramp to access Platform 2
- reinforced concrete footings for the reinforcement of trestle columns
- foundations for the proposed extension to the station services equipment room
- services trenching works in the platforms and combined services route for the proposed station services equipment room
- adjustment / diversion/ protection of existing underground services
- localised platform regrading / resurfacing work
- construction of upgraded footpath areas, entry plaza areas and kerb realignment works

- other minor civil works including drainage/stormwater works, footings and foundations for light poles and other structures / infrastructure.

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

3.1.9 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 *Infrastructure Sustainability (IS) Rating Scheme (v1.2)* and the program Sustainability Strategy target of reducing life cycle impacts of materials. Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.1.10 Traffic access and vehicle movements

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

Traffic generated by construction activities includes construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, and construction plant and equipment. Vehicle types and sizes would vary depending on the required use, but typically include medium and large rigid vehicles and articulated vehicles for import of bulk materials or spoil removal, as well as concrete trucks.

The amount of fill material or spoil/ demolition spoil would be minor due to the limited extent of excavation required for the Proposal. Specific oversize vehicles may be required for prefabricated / precast elements such as lift shaft structure components, and steel beams and precast concrete deck slabs for the elevated walkway access to Platform 1 lift.

The traffic generated as a part of the construction works is not expected to exceed 25 light vehicles and 15 heavy vehicles per day during peak construction periods.

3.1.11 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 is proposed within the railway corridor off Platt St (refer to Figure 12). The area nominated for the compound is on land owned by RailCorp and leased to ARTC.

The main construction compound would be required to accommodate a site office, amenities, laydown and storage area for construction plant / equipment and materials, with up to two vehicular access points.

Other worksite areas would be established during the course of the construction period and would be staged to minimise inconvenience to the customers and adjacent public areas. All established worksite areas would include suitable demarcation hoarding or fencing. Such sites would include:

- worksite areas on the station platforms. These would be installed ensuring access to the station platform is available at all times when trains are running
- worksite area at the station entrance off Platt Street for the proposed ramp and adjustment to the existing stairs
- worksites in and around the existing footbridge, including:
    - for footbridge repair works

    - for the lift construction at the junction of Railway Terrace and Hanbury Street
- worksites external to the rail corridor for utility protection, adjustments or diversions and power supply upgrade work
- worksites for interchange works within the adjacent road reserves.

The existing station interchange areas at the station entrance on Platt Street and Railway Terrace may be closed off at times to allow some of the above activities to take place. These closures would only be for short durations and some construction activities will require traffic management to ensure safe access.

3.1.12 Public utility adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation would be required. It is noted that only Dial Before You Dig information is available at this stage. The proposed lift locations have been chosen to minimise impacts on the services identified through DBYD (mainly Telstra and Jemena).

It is likely some services may require relocation, but such relocation is unlikely to occur outside of the footprint of the works assessed in this REF. In the event that works would be required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase and subsurface utility investigations would be undertaken to confirm asset location. Refer to Section 6.11.2 for further information.

3.2 Property acquisition

No acquisition of privately-owned freehold land is envisaged for the Proposal.

However, implementation of the Proposal will include acquisition of part of the City of Newcastle road reserve north of the rail corridor at the junction of Railway Terrace and Hanbury Street as shown in Figure 10 for construction one of the proposed lifts.

TfNSW will acquire the required road reserve land in accordance with Sections 204 to 206 of the *Roads Act 1993* (in substitution for the relevant provisions of the *Land Acquisition (Just Terms Compensation) Act 1991*).

The required acquisition will be confirmed in discussions with the City of Newcastle in the design development stage of the Proposal.

Following completion of the Proposal the acquired lands will be vested to RailCorp and future maintenance of the new facilities provided in the Proposal will be undertaken by Sydney Trains.

3.3 Operation management and maintenance

The future operation and maintenance of Waratah Station and the adjacent interchange precinct is subject to further discussions with Sydney Trains, NSW Trains, ARTC, TfNSW and Newcastle City Council. However, the Proposal is not anticipated to significantly alter the current operating arrangements.

New or modified station infrastructure within the rail corridor and main station precinct constructed under this Proposal would be maintained by Sydney Trains, while the accessible parking and adjustments for interchange parking would be maintained by the relevant road authority, and the bus stop seating would be maintained by Newcastle City Council.

4 Statutory considerations

Chapter 4 provides a summary of the statutory considerations relating to the Proposal including a consideration of NSW Government polices/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.

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

4.2 NSW legislation and regulations

4.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of 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 TfNSW, which do not require development consent under Part 4 of the Act.

In accordance with section 5.5 of the EP&A Act, TfNSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal.

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 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.

4.2.2 Other NSW legislation and regulations

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

Table 2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016(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).
Biosecurity Act 2015	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 Priority Weeds in Newcastle City Council are encountered (refer Section 6.7). One weed – Fireweed (*Senecio madagascariensis*) a Priority Weed of the Hunter Region listed under the *Biosecurity Act 2015* was identified in the study area.
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the Office of Environment and Heritage (OEH), and potentially investigate and remediate land if contamination is above EPA guideline levels. The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.8).
Crown Lands Act 1987 (NSW)	The Proposal does not involve works on any Crown land.
Disability Discrimination Act 1992 (DDA Act) (Cwlth)	The Proposal would be designed with regard to the requirements of this Act.
Heritage Act 1977 (Heritage Act) (NSW)	• 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. Waratah Station is not listed on the NSW State or local heritage register. Also, the station is not listed on RailCorp's Section 170 Heritage and Conservation Register. A preliminary heritage assessment and archaeological review has been undertaken for the Proposal and is summarised in Section 6.5 and 6.4. The preliminary archaeological assessment concluded that there is a low risk of exposing historical archaeological relics during construction and that no archaeological approvals under the Heritage Act would be required. If unexpected archaeological items were to be discovered during the construction of the Proposal, all works would cease and appropriate advice would be sought.
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from OEH for the destruction or damage of Indigenous objects. The Proposal is unlikely to disturb any Indigenous objects (refer Section 6.4). However, if unexpected archaeological items or items of Indigenous heritage significance were to be discovered during the construction of the Proposal, all works would cease and appropriate advice would be sought.

Applicable legislation	Considerations
Protection of the Environment Operations Act 1997 (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, TfNSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Construction Contractor.
Roads Act 1993 (Roads Act) (NSW)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads. Proposed construction activities may require works on or adjacent to Platt Street and Railway Terrace, both State classified roads (partly as part of Route B63) under the control of RMS. Consent under the Roads Act is not required; however, Road Occupancy Licence/s would be obtained from the relevant road authority for road works and any temporary road closures. Refer to Section 6.1 for more information.
*Hunter Water Act 1991 (*Hunter Water Act*) (NSW)*)	The works associated with the Proposal would not involve alterations to current discharge of wastewater to the sewer. The new FAT / Ambulant toilet would discharge to the sewer therefore there would be no change to the current station sewer connection. However, the proximity of a nearby stormwater channel off Platt Street may require consultation with Hunter Water to ensure that any activities that may impact the stormwater channel are minimised and that any mitigation measures required for the protection of the asset are implemented.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	TfNSW would carry out the Proposal with regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.
Water Management Act 2000 (NSW)	The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management works, drainage or flood works, controlled activities or aquifer interference.

4.3 State Environmental Planning Policies

4.3.1 State Environmental Planning Policy (Infrastructure) 2007

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

Clause 79 of the Infrastructure SEPP allows 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).

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:

'(d) railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms

(e) 'public amenities for commuters

(f) 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.

It is noted that the Infrastructure SEPP prevails over all other environmental planning instruments except where *State Environmental Planning Policy (State Significant Precincts) 2005* or *State Environmental Planning Policy (Coastal Management) 2018* applies. The Proposal does not require consideration under these SEPPs and therefore they do not require further consideration as part this REF.

4.3.2 State Environmental Planning Policy 55 – Remediation of Land

SEPP 55 provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. 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 unlikely that any large-scale remediation (Category 1) work would be required as part of the Proposal. The proposed land use does not differ to the existing use and is, therefore, unlikely to be affected by any potential contaminants that may exist within the rail corridor.

4.4 Local environmental planning instrument and development controls

The Proposal is located within the Newcastle City Council LGA. The provisions of the Infrastructure SEPP mean that Local Environmental Plans (LEPs), prepared by councils for an LGA, do not apply. However, during the preparation of this REF, the provisions within the *Newcastle Local Environmental Plan 2012* (LEP) were considered.

4.4.1 Newcastle Local Environmental Plan 2012

The *Newcastle Local Environmental Plan 2012* (Newcastle LEP) is the governing plan for the Newcastle City Council LGA, including the suburb of Waratah. Table 3 summarises the relevant aspects of the Newcastle LEP applicable to the Proposal. Figure 13 shows the relevant section of the zoning map from the Newcastle LEP, with the indicative location of the Proposal.

Table 3 Relevant provisions of the Newcastle LEP

Provision description	Relevance to the Proposal
Clause 2.3- Zone Objectives and Land Use Table	Under the Newcastle LEP: • Waratah Station is zoned SP2 Infrastructure- Rail Infrastructure Facilities • the adjacent road (Railway Terrace/Platt Street) is zoned SP2 Infrastructure • surrounding residential areas are zoned R3 - Medium Density Residential, R4 - High Density Residential and R2 - Low Density Residential • the Station Street shopping precinct area is zoned B2 - Local Centre • Waratah Park to the south, is zoned RE1 - Public Recreation The Proposal is consistent with the objectives of these zones.
Clause 5.10- Heritage Conservation	Clause 5.10 of the Newcastle LEP aims to conserve the heritage significance of heritage items, archaeological sites, Aboriginal objects and Aboriginal places within the LGA. Waratah Station is not included in Schedule 5 of the Newcastle LEP and no local heritage items would be impacted by the Proposal. The nearest heritage items listed on the Newcastle LEP include: • Waratah Park and Station Street palms (I673) - immediately south of Platt Street • Town Hall Hotel (I667) - approximately 215m distant • Former Waratah Post Office (I669) - approximately 180m distant • Waratah Technology High School (I670) - approximately 250m distant A discussion of potential impacts to local heritage is provided in Section 6.5.
Clause 6.2- Earthworks	Clause 6.2 of the Newcastle 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. 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.

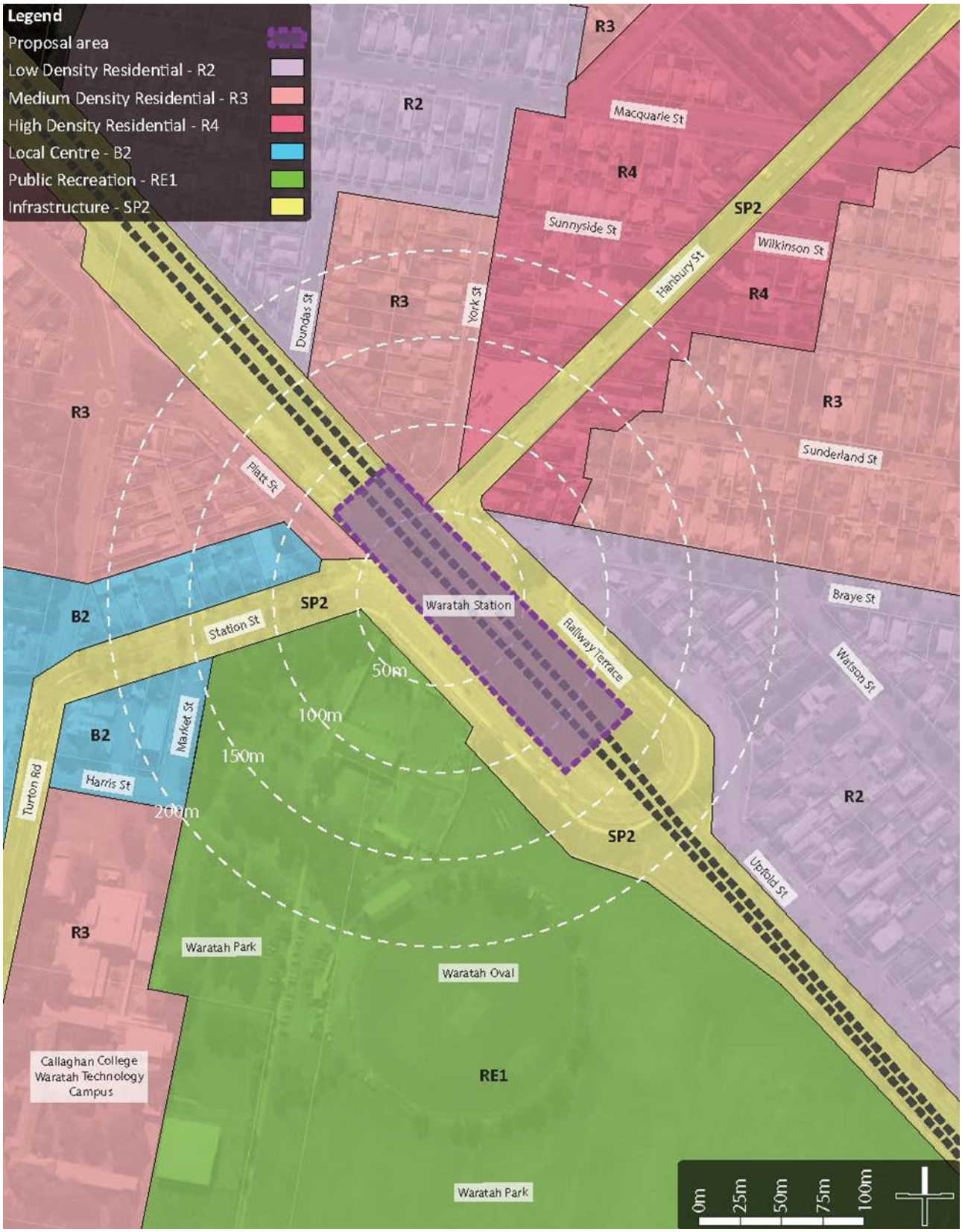

Figure 13 Newcastle LEP zoning map

4.5 NSW Government policies and strategies

Table 4 provides an overview of other NSW Government policies and strategies relevant to the Proposal.

Table 4 NSW Government policies and strategies applicable to the Proposal

Policy/Strategy	Commitment	Comment
NSW: Making It Happen (NSW Government, 2015)	In September 2015, the NSW Government announced a series of State Priorities as part of *NSW: Making It Happen* (NSW Government, 2015). The State Priorities are intended to guide the ongoing actions of the NSW Government across the State, and guide resource allocation and investment in conjunction with the NSW Budget. *NSW: Making it Happen* focuses on 12 key 'priorities' to achieve the NSW Government's commitments. These priorities range across a number of issues including infrastructure, the environment, education, health, wellbeing and safety in addition to Government services. One of the 12 priorities identified as part of *NSW: Making It Happen* relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority.	The Proposal assists in meeting the priority by improving accessibility to, and encouraging greater use of, public transport.

Policy/Strategy	Commitment	Comment
Future Transport Strategy 2056 (TfNSW 2018a)	*Future Transport 2056* is an update of NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the State. The strategy places the customer at the centre of works undertaken by TfNSW. It includes issue specific and place based supporting plans that seek to integrate transport modes. The strategy outlines 6 Statewide outcomes • customer focused • successful places • a strong economy • safety and performance • accessible services • sustainable.	The Proposal would deliver on the customer focus and accessible services outcomes. The Transport Access Program is specifically referenced in the strategy as an example of accessibility initiatives that are underway.
Greater Newcastle Future Transport Plan (TfNSW,2017e)	The *Greater Newcastle Future Transport Plan* identifies key transport policy, service and infrastructure initiatives for investigation within the Greater Newcastle area.	The Proposal would be part of delivering on the following key objectives in the transport plan: • station upgrades and integration between the stations and surrounding land uses to support increased public transport use • improved integration and interchange between modes/services to enable seamless customer experiences
Disability Inclusion Action Plan 2018-2022 (TfNSW, 2017f)	The *Disability Inclusion Action Plan 2018-2022* was developed by TfNSW in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Plan outlines practical measures to be taken across the various Transport agencies (e.g. TfNSW, Sydney Trains etc) to meet the objectives and principles of the *Disability Inclusion Act 2014*. These measures will also assist TfNSW to meet its obligations under the Transport Standards.	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.

Policy/Strategy	Commitment	Comment
Building Momentum State Infrastructure Strategy 2018-2038 (Infrastructure NSW 2018)	*The State Infrastructure Strategy 2018-2038* is a strategy to plan and fund the infrastructure that the NSW Government delivers over the next 20 years. Public transport is viewed as critical to productivity, expanding employment opportunities by connecting people to jobs, and reducing congestion.	The Proposal invests in public transport so that it provides a service that is accessible to a wider range of customers.
Greater Newcastle Metropolitan Plan 2036 (Department of Planning and Environment, 2018a)	*The Greater Newcastle Metropolitan Plan 2036* sets out strategies and actions that will drive sustainable growth across Cessnock City, Lake Macquarie City, Maitland City, Newcastle City and Port Stephens communities which make up Greater Newcastle. The plan aligns with the vision and goals of the *Hunter Regional Plan 2036* and will guide local planning across the five Greater Newcastle Council areas.	The Proposal would be consistent with the aims of the plan to improve connections to jobs, services and recreation.
Newcastle 2030 Community Strategic Plan (Department of Planning and Environment, 2018b)	The *Newcastle 2030 Community Strategic Plan* (CSP) is based on the aspirations, knowledge and values of the community. The CSP is a shared community vision to inform actions over the next 10 years and is a requirement under the *Local Government Act 1993.* A strategic direction of the CSP is integrated and accessible transport. Key directions include: • effective and integrated public transport • plan and deliver accessible local infrastructure improvements for public transport.	The Proposal assists in meeting the directions of the CSP as it improves access to public transport.

4.6 Ecologically sustainable development

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

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

The principles of ESD have been adopted by TfNSW throughout the development and assessment of the Waratah Station Upgrade. Section 3.1.4 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 strategy adopted including the consultation undertaken to date and proposed for the future. This chapter discusses the results of consultation with the community, relevant government agencies and stakeholders.

5.1 Stakeholder consultation during concept design

As part of the design development for the Proposal, meetings and workshops were held to ensure that key stakeholders were involved in the collaborative design process. Key stakeholders include:

- TfNSW
- Sydney Trains
- ARTC.

Meetings with Sydney Trains and ARTC were held to discuss proposed work and the requirements for rail shutdowns.

Newcastle City Council is a key stakeholder who will continue to be consulted during the project.

5.2 Consultation requirements under the Infrastructure SEPP

Under the Infrastructure SEPP (Part 2, Division 1), consultation is required with local councils or public authorities in certain circumstances, including where Council-managed infrastructure is affected. 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. Consultation with Newcastle City Council would occur through the detailed design and construction of the Proposal.

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

Table 5 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	Consultation is required where the Proposal would result in: • 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 • significant disruption of pedestrian or vehicle movement • significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes works that would: • require connections or impacts the stormwater system • disrupt pedestrian and vehicle movements • impact on Council-operated footpaths. Consultation with Newcastle City Council would be undertaken and continued throughout the detailed design and construction phases.
Clause 14 | Consultation with Councils – development with impacts on local heritage	Consultation is required where railway station works: • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	There is no potential impact to local heritage/heritage conservation area. Accordingly, consultation with Council is not required. Refer to Section 6.5.
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Consultation is required where railway station works: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land.*	The Proposal is partially located on land that is susceptible to frequent and flash flooding. A small portion of the site (on the south west side) has a low to medium flood risk. However, Platt Street is classified as a high-risk flood area. Accordingly, consultation with Council is required in regard to this aspect. Refer to Section 6.9.
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	Consultation is required where railway station works: impact on land within a coastal vulnerability area and is inconsistent with certified coastal management programs that apply to that land	The Proposal is not within a coastal vulnerability area. No council consultation would be required in relation to this clause.

Clause	Clause particulars	Relevance to the Proposal
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Consultation is required where railway station works: impact on flood liable land - written notice must be given (together with a scope of works) 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.	The Proposal area has been identified as having potential for flooding. Accordingly, notice would be provided to the State Emergency Service and any response would be taken into consideration if received within the required period.
Clause 16 | Consultation with public authorities other than Councils	Consultation is required with specified public authorities when an activity is classified as specified development. Subclauses (2) (a) – (i) and 3 do not apply to the Proposal. Although not a specific Infrastructure SEPP requirement, other agencies TfNSW may consult with could include: • Roads and Maritime Services • Sydney Trains • NSW TrainLink • OEH.	The Proposal is not considered specified development under the Infrastructure SEPP. Accordingly, consultation with specified authorities is not required.

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 was prepared with regard to the requirements of the planning process and 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:

- public display of the REF at various locations
- distribution of a project newsletter 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 TfNSW website that includes a summary of the Proposal and information on how to provide feedback
- consultation with council, Sydney Trains, ARTC and other non-community stakeholders.

TfNSW would also undertake the following consultation for the Proposal:

- direct notification to station customers and the broader community
- pop up information stall at Waratah Station
- public display of the REF.

Community consultation activities for the Proposal would be undertaken during the public display period of this REF. The REF would be displayed for a period of approximately 2 weeks. Further information about these specific activities is included in Section 4.5 of this REF.

The REF would be placed on public display on the TfNSW website[1], Your Say website[2] and at the following locations:

- Newcastle Council City Administration Centre – 282 King St, Newcastle NSW 2300
- Mayfield Library – 104 Hanbury St, Mayfield NSW 2304
- TfNSW Office at Level 5, Tower A, Zenith Centre, 821 Pacific Highway, Chatswood.

Further information on the Proposal may be requested by contacting the Project Infoline (1800 684 490) or by email[3].

During the display period feedback from the community is invited and can be submitted in the following ways:

- Mail: Transport Access Program – Waratah,
  Associate Director, Environmental Impact Assessment
  Transport for NSW
  Locked Bag 6501
  St Leonards NSW 2065
- Email: projects@transport.nsw.gov.au
- Webpage: yoursay.transport.nsw.gov.au/Waratah

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

[1] https://www.transport.nsw.gov.au/projects/current-projects/waratah
[2] yoursay.transport.nsw.gov.au/Waratah
[3] projects@transport.nsw.gov.au

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 Waratah Station) plus a 200-metre radius, on 22 June 2018. No known Aboriginal objects or places were identified within the 200m radius of the station (refer Section 6.4).

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. However, as key members of the community, the Local Aboriginal Land Council has been included as a stakeholder and received project information in line with the wider community.

5.6 Ongoing consultation

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

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

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

6 Environmental impact assessment

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

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

6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment was prepared for the Proposal (SLR 2018a). The assessment involved a desktop study, a pedestrian demand survey undertaken 26 September 2018 by Trans Traffic Survey on behalf of SLR and a site inspection by SLR Consulting personnel on 28 September 2018.

The Proposal area for the assessment included the station, the immediate fronting road and pathway system, kerbside pick-up and set-down facilities, and the proposed construction compound area. The area surrounding the Proposal comprises residential areas of varying density (low to high), public recreation space and a local business/commercial area.

The desktop portion of the assessment considered the concept design and the Waratah Station Upgrade Preliminary Environmental Assessment (TfNSW, 2018h). Traffic modelling was not considered necessary as the Proposal is focused on the station and is unlikely to have a major impact on the surrounding road network. The findings of the assessment are summarised in this section.

6.1.1 Existing environment

Waratah Station and Access

Waratah Station services the Hunter Line, providing public transport links between Newcastle Interchange, Maitland Station and Dungog Station. It also provides people the opportunity to access and transfer between transport modes and services including cycling, bus and taxi. The frequency of rail services stopping at Waratah Station during the week and on weekends is shown in Table 6.

The station has one side platform (Platform 2) on the western side off Platt Street, and one island platform (Platform 1 western side only) for customer use. The rail lines on the eastern side of the island platform are used for freight only. The island platform can be accessed via stairs and the footbridge from Platt Street and Railway Terrace. There is currently no accessible path of travel to the platforms.

Table 6 Waratah Station service frequency

Destination	Operating days	Service frequency
Newcastle Interchange	Monday to Friday	Peak: approx. 30 mins Off-peak: approx. 27-60 mins
	Weekends and public holidays	Peak: approx. 2-60 mins Off-peak: approx. 30-60 mins
Scone/Dungog	Monday to Friday	Peak: approx. 10-28 mins Off-peak: approx. 15-85 mins
	Weekends and public holidays	Peak: approx. 20-60 mins Off-peak: approx. 12-90 mins

Source: TfNSW, 2018 https://transportnsw.info

Road network and traffic

The station is bound on three sides by Railway Terrace/Platt Street, which loops around the station via a bridge structure so that it can pass over the railway line to the immediate southeast. These roads form part of the B63 route from Williamtown to Nelson Bay. The surrounding road network is summarised in Table 7. The network directly adjacent to the proposal includes roads managed by RMS and Newcastle City Council. The roads comprising the B63 route are considered to have moderate traffic volumes.

Table 7 Surrounding road network characteristics

Road name	Posted speed limit	School zone	Configuration
Hanbury Street	60km/h	No	2-4 lanes, undivided, no parking restrictions
Railway Terrace	Residential: 50km/h Station Frontage: 60km/h	No	Residential: 2 lanes unmarked, undivided, no parking restrictions Frontage: 2 lanes, divided, bicycle lane on both sides
Platt Street	Residential: 50km/h Station Frontage: 60km/h	No	Residential: 2 lanes unmarked, undivided, no parking restrictions Frontage: 2-3 lanes, mostly undivided, bicycle lane on both sides (B63)
Braye Street	50km/h	No	2 lanes undivided, no parking restrictions
Turton Road	Residential: 50km/h B63: 60km/h	Yes	Residential: 2-3 lanes, mostly unmarked, undivided, no parking restrictions B63: 4 lanes, undivided
Upfold Street	50km/h	No	2 lanes, unmarked, undivided, no parking restrictions
York Street	50km/h	No	2 lanes unmarked, undivided, no parking restrictions
Station Street	Residential: 50km/h B63: 60km/h	No	Residential: 2 lanes unmarked, undivided, restricted parking east of Tighe Street - otherwise unrestricted B63: 3 lanes, mostly undivided

Parking

There is no formalised commuter car parking facility available to station customers. There is unrestricted on-street car parking available on surrounding streets, including:

- both sides of Platt Street to the north of Station Street
- both sides of Turton Road to the north of Station Street
- both sides of Upfold Street
- both sides of Braye Street (including the informal parking area at the Railway Terrace/Braye Street intersection)
- the western side of York Street and the northern side of Railway Terrace (to the northwest of Hanbury Street).

Observations of nearby on-street parking demand using aerial imagery collected on weekdays suggests that there is spare capacity available within reasonable walking distance.

Taxi and kiss and ride facilities

Pick-up and set-down or kiss and ride / taxi zone facilities are currently provided on both station frontages. The Platt Street frontage has sufficient length to accommodate 2-3 waiting vehicles in a No Parking zone.

There are also pick-up and set-down facilities located on the Railway Terrace/Hanbury Street frontage with sufficient kerbside length to accommodate 4-5 vehicles. Approximately two-thirds of the kerb length is not sign-posted while the remaining one-third is signed as a Taxi Zone.

Surveys of both station frontage informal kiss and ride facilities observed that they are infrequently used. Only one vehicle was observed to use the Railway Terrace facility across the combined AM and PM peak periods. The Platt Street facility was observed to be marginally busier with three vehicles utilising it during the AM peak period.

During the site inspection it was observed that motorists travelling southbound from Hanbury Street would pick-up/set-down station users in the informal parking area located in road reserve north of Railway Terrace.

Bus Services

There are two bus stop locations close to Waratah Station:

- both sides of Platt Street to the north of Station Street
- both sides of Hanbury Street opposite Sunderland Street.

One public bus route (24) currently services the Waratah Station on a regular basis (which is the Wallsend – Marketown via Mayfield route).

There are several other bus routes that provide 1-2 services per day including school services, additional details are within the Traffic, Transport and Access Impact Assessment.

Bicycle network and facilities

Waratah Station is located along Bicycle Route 6 which consists of shared pathways and residential streets between the Newcastle CBD and the University of Newcastle.

Currently there is no means of transporting a bicycle to the station platforms without having to carry it up (and down) a number of stairs. There is a single unsheltered bicycle rail facilitating parking for approximately seven bicycles adjacent to the Platt Street station entrance.

Adjacent to the station, this bicycle route consists of an off-road shared path on Platt Street from Prince Street which requires cyclists to cross at the signalised crossing in front of the

station. The path then continues beside Platt Street/Railway Terrace over the railway overpass before deviating to Upfold Street. Bicycle lanes are also provided along the Platt Street and Railway Terrace frontages of the station.

Heavy vehicle routes

Waratah Station is surrounding by a well-established road network, including a state road (Route B63) which fronts the station to the north and south.

6.1.2 Potential impacts

a) Construction phase

Customer and public access

The following potential impacts to Waratah Station customers, pedestrians and cyclists are anticipated from construction activities:

- increased construction vehicle traffic including light and heavy vehicles within the station precinct and along proximity roads and streets including Railway Terrace and Platt Street (B63 route and local segment) for movement to/from the proposed construction compound accessed via Platt Street
- temporary loss of approximately 2-4 existing untimed on-street car parking spaces in the Platt Street
- temporary increased demand for all-day parking for construction staff assuming the compound cannot accommodate sufficient staff 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.

Road network and traffic

Traffic generated by construction activities would include construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, and construction plant and equipment. Vehicle types and sizes would vary depending on the required use. Typically, construction trucks travelling on the road network would consist of medium and large rigid vehicles and articulated vehicles for import of materials and equipment and/or excavated material removal. Specific oversize vehicles may be required for specialist construction activities.

General construction traffic would be able to access the site via three routes (Platt Street, Station Street, and Hanbury Street/Railway Terrace). However, heavy vehicle access to the construction compound would be limited to specific routes depending on their length.

The traffic generated as a part of the construction works is not expected to exceed 25 light vehicles and 15 heavy vehicles per day during peak construction periods. Given the moderate traffic volumes currently observed on the adjacent state road corridor, this additional traffic is unlikely to cause any significant impact to traffic flow or operational performance of the adjacent road network. However, this also means that the effects of any traffic obstructions caused by construction activities or issues with construction vehicles would be magnified given the moderate traffic environment along this corridor.

Parking

A swept path assessment conducted using AutoTURN and adopting a maximum 19 metre Articulated Vehicle design truck indicates that longer vehicle entry to the proposed construction compound would require widening of the existing northern entry/crossover to the area. Crossover widening would also require the removal of 2-4 existing car parking spaces on Platt Street. Smaller vehicle entry would be accommodated by the current crossover.

The additional proposed southern entry point to the construction compound would require traffic to turn across the shared pedestrian/cycle path. This would require additional consideration of traffic management. This proposed entry to the proposed construction compound would also require consideration of the structural capacity of the area crossing the stormwater channel beneath.

Two to four parking spaces on Platt Street may be temporarily removed to provide a widened access to the proposed construction compound. The temporary loss of parking in this location is expected to have minimal impact as there is sufficient spare capacity in the surrounding streets within a reasonable walking distance.

It is anticipated that the proposed construction compound would include facilities for construction personnel parking.

Interchange facilities

The Proposal is not expected to significantly impact the operation of local public transport services, including rail services travelling through Waratah Station. Construction activities will not require additional rail shut down periods (rail possessions). The Proposal will utilise routine scheduled closures that would occur regardless of this project. Alternative public transport arrangements would be provided during rail shut down periods.

Other impacts to public transport services during construction of the Proposal would be:

- temporary lowering of speed limits along Platt Street, Railway Terrace and Hanbury Street may slightly increase travel times for bus services travelling along the site frontages
- bus services may also be delayed due to the interaction with construction vehicles entering and exiting the site compound on Platt Street
- seating at the surrounding bus stops is likely to be temporarily unavailable as the seating is replaced.

Property access

Property access would be maintained during construction to minimise the impact to local residents. However, during activities such as unloading of oversized materials, short term diversions to properties may be necessary. Affected residents would be notified in advance of the scheduled works.

b) Operational phase

The Proposal would result in positive impacts by making railway transport more accessible to the community. A summary of the operational traffic, transport and access impacts is provided below.

Customer and public access

The Proposal has been designed to cater for the estimated 2036 daily patronage plus 15 per cent. A pedestrian capacity assessment was undertaken to determine if the Proposal would adequately cater for the projected increase in customers in terms of pedestrian flows (SLR, 2018a).

To assess the pedestrian Level of Service (LoS), Fruin's Pedestrian Flow Rate criteria was adopted (RailCorp, 2010), which is the number of pedestrians that pass a point during a specific period of time for a given level of service, 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 'A' for all the new accessible pathways and existing footbridge (for 2036 plus 15 per cent under normal peak hour conditions), which means there would be no congestion or delays during the ongoing use of the new access path.

The new lifts are integral in allowing all areas of the station to be accessed by persons with a disability or mobility impairment, which is not currently possible given the design of the existing footbridge. This would facilitate improved community outcomes by increasing the independence and mobility of the local community regardless of their level of mobility, therefore reducing reliance on private vehicles as a means of travel.

The new access ramp to Platt Street would remove the requirement for all passengers to traverse at least one flight of stairs to access the station. The proposed location of the ramp also directs passengers to the kiss and ride / taxi zones and the proposed accessible parking space. This would assist in wayfinding and better aligns with user desire lines. A flight of stairs would be maintained adjacent to the access ramp to facilitate direct access to the external pathway system for those not needing the ramp.

Overall the proposed upgrade to the station would offer substantial pedestrian benefits in terms of improved and equitable customer experience and amenity.

Road network

The proposal would improve customer access to Waratah Station which may lead 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.

Therefore, there may be an increase in traffic generation; however, it is projected to be minor and would have a negligible impact on the surrounding road network and the amenity of local residents. Similarly, the Proposal is unlikely to bring about a change in motorist behaviour, or introduce or require changes in current travel behaviours and patterns.

Parking

The Proposal includes the conversion of existing kerbside space on Platt Street north-west of the station to provide a new accessible parking space. The loss of around 2-4 existing general use parking kerb space is not projected to be a significant impact given the availability of other parking locations that are located within reasonable walking distance.

Although the station upgrade may encourage additional passenger numbers and associated demand for car parking, this is expected to be relatively minor given the primary focus of the Proposal is improving accessibility for mobility impaired customers rather than increasing utilisation and passenger capacity.

Interchange facilities

The Proposal would enhance existing passenger kiss and ride / taxi facilities by improving line marking, signage and kerbs both on the Railway Terrace frontage and Platt Street.

Given the very low existing demand observed at both facilities, the proposed improvements would improve pedestrian loading/unloading from vehicles, but are not projected to bring about an increase in demand such that the current capacity is exceeded. It is recommended that the

improved pick-up/set-down facility is sign posted as a No Parking zone such that it can be used by the general public, taxis and rideshare services.

The minor change in location of the bicycle rack on the Platt Street side of the station is not anticipated to impact on cyclists use of the station. The addition of one bicycle space within the bicycle rack would have a negligible impact upon the use of the station by cyclists. The installation of the new lifts connecting to the existing footbridge would, however, provide a minor benefit to cyclists as they would no longer have to carry their bicycles up and down the stairs to use the footbridge.

6.1.3 Mitigation measures

A Construction Traffic Management Plan (CTMP) would be prepared by the construction contractor in consultation with TfNSW and provided to RMS and Newcastle City 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 (if required) or traffic controls to manage temporary road disruptions
- identification of final construction traffic access routes, site compound, contractor parking and loading zones
- nomination of access routes to and from the local road network and construction contractor parking
- scheduling of works/deliveries to avoid peak times and limiting of works in the road carriageway as much as practicable to limit parking losses and maintain customer access to the station
- measures to:
    - limit temporary parking losses
    - maintain customer access to and from the station
    - maintain private property access unless otherwise agreed
    - identify changed traffic/pedestrian conditions including details of construction signage using signposts and variable message signs, traffic controllers and other community notifications.

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

6.2 Urban design, landscape and visual amenity

A Visual Impact Assessment was undertaken by RPS for the Proposal (RPS, 2018b). The findings of the assessment are summarised in this section. The assessment included desktop analysis, site inspection and creation of photomontages (also referred to as artist's impressions). The photomontages provide a visual indication of the Proposal 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 Visual Impact Assessment was prepared in accordance with the *Roads and Maritime Environmental Impact Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment* (Roads and Maritime, 2013). In accordance with this guideline, an impact grading matrix was used to assess both landscape and visual impacts. The sensitivity and magnitude of the impact was assessed to produce a combined impact rating of negligible, low, moderate and high (refer to Figure 14).

Sensitivity \ Magnitude	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 14 Roads and Maritime impact grading matrix

6.2.1 Existing environment

Landscape character

Four landscape character zones (LCZs) have been identified for the Proposal. The LCZs are shown in Figure 15, and described below:

LCZ 1 – Residential:

This zone is defined by a generally homogenous style of residential urban development on either side of the road. Dwellings are typically 1 to 2 storeys in height with a 6.0 metre setback off the road, providing a narrow streetscape. The streets are lined with a mix of native and exotic trees, with pedestrian pathways installed in most streets. The streetscapes are complimented with low timber fencing boundaries to the residential lots.

LCZ 2 – Waratah Shops Precincts (2a Station Street and 2b Hanbury Street):

2a: This zone features several heritage listed properties, including Town Hall Hotel, Waratah Post Office (Former), Waratah School of Arts (NSW Office of Environment and Heritage, 2015). The Town Hall Hotel contributes to the character of the street.

The remaining Station Street features residential properties, Waratah Park and the Station St Palms. This landscape zone is notable because of its old plantings and buildings.

2b: This zone features various commercial activities of Waratah, centred around mixed use. Hanbury Street features businesses, and commercial properties, residential, larger scale developments and Webb Park.

The zone features a collection of brickwork, corrugated iron, and cement depending on the age of the building. Outside of the commercial qualities of this landscape character is the typical urban streetscape effects, including electrical light poles, pedestrian paths, and signage

LCZ 3 – Railway Infrastructure (Railway Terrace):

This zone features rail infrastructure and the elevated road way over the rail corridor. The elevated road bridge is vegetated on the built-up areas with established trees on the boundary line on the outside of the rail corridor. The road is one lane each way and bounded by barrier fencing, median concrete strips, with a bicycle lane on either side of the road.

LCZ 4 Open Recreation Space:

LCZ4 encompasses the open recreational space including Waratah Park and Waratah Oval. The zone features established trees, soft landscapes, turfed areas, and pedestrian connections through to Waratah Oval, Callaghan Collage and the neighbouring Community-use buildings. Waratah Oval features multiple sporting fields that are catered for many different sports.

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.

Seven locations have been identified to represent key viewpoints to and from the Proposal. 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.

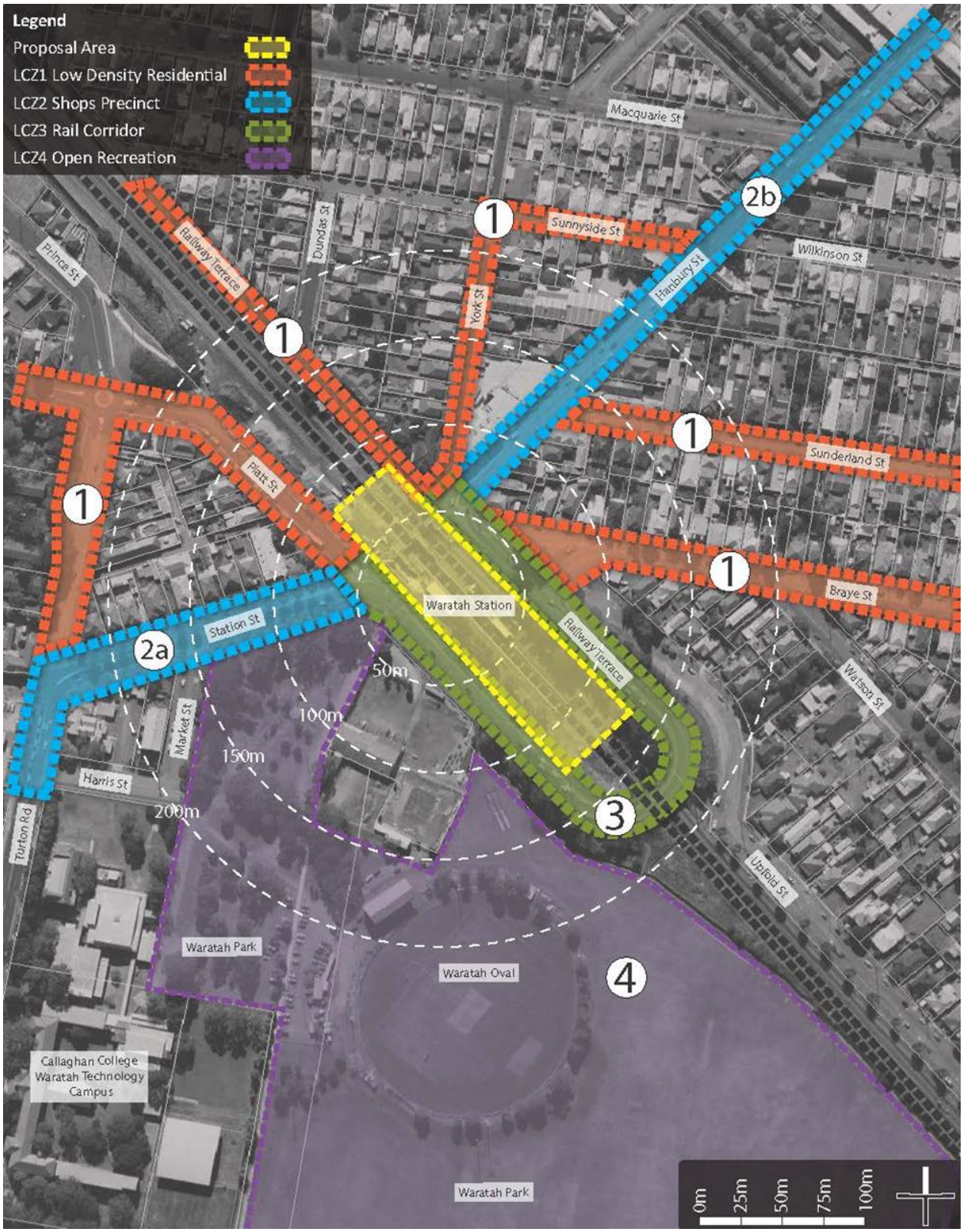

Figure 15 Landscape Character Zones

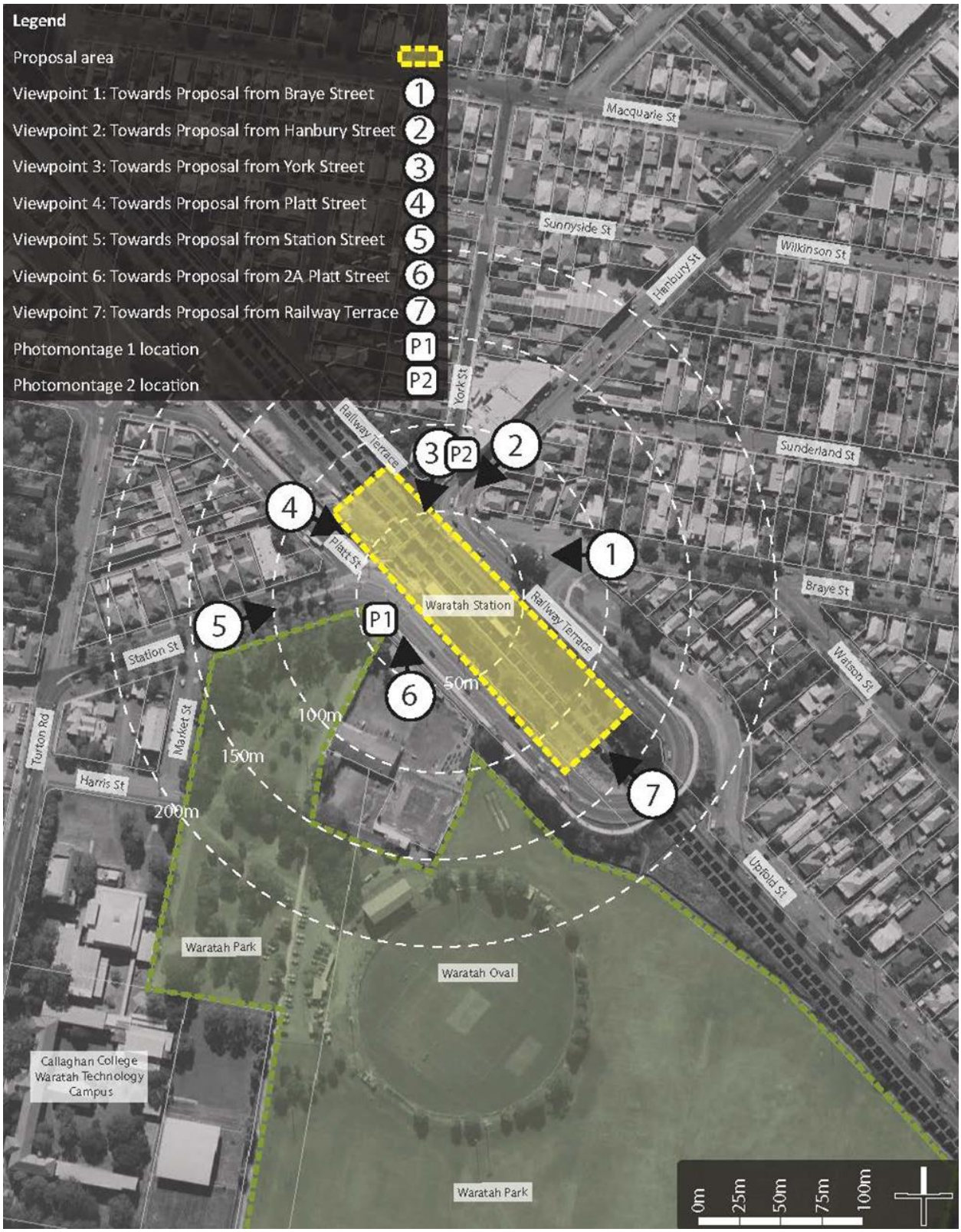

Figure 16 Viewpoint locations

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
- crane and other construction equipment
- site office and amenities.

Where night works are 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.

b) Operational phase

Photomontages have been prepared looking from locations P1 and P2 as shown in Figure 16. The photomontages (Figure 18 and Figure 20) provide an indicative view of the Proposal following the completion of construction activities.

An assessment of the visual sensitivity and the magnitude of each viewpoint during the operational phase is provided in Table 8. The assessments are made using the impact grading system matrix previously discussed (refer to Figure 14).

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

Figure 17 Existing view from Platt Street

Figure 18 Photomontage of the view from Platt Street

Figure 19 Existing view from York Street

Figure 20 Photomontage of the view from York Street

Table 8 Summary of visual impact assessment

Viewpoint	Summary	Overall impact
Viewpoint 1: Views from Braye Street	• The Proposal is 200m from Braye Street • There is some existing vegetation screening this view • Little visual change to landscape character form this location	Negligible
Viewpoint 2: Views from Hanbury Street	• There is some existing vegetation and fencing screening being removed from this view • Some minor visual change to environment from this location but changes are in line with existing landscape character	Moderate-Low
Viewpoint 3: Views from York Street	• Removal of vegetation and fencing on this view line to station • This change will expose more of the station infrastructure to viewpoint from this station however is still in keeping with existing urban landscape character	Moderate
Viewpoint 4: Views from Platt Street	• No change to level of exposure from this location to the Proposal • The landscape character in this area is already dominated by the station infrastructure • The addition of the proposal will have negligible change to the landscape character of this view	Negligible
Viewpoint 5: Views from Station Street	• Small increase in exposure of Proposal from this location due to relocation of advertising device • The landscape character at the termination of the view is already dominated by the station infrastructure and arguably improved by removing the advertising device • The addition of the proposal will have negligible change to the landscape character of this view	Negligible
Viewpoint 6: Views from Waratah Park and Community Use Buildings	• No change to level of exposure from this location to the Proposal • There is some existing vegetation screening this view • The addition of the Proposal will have low impact to the landscape character of this view	Moderate-Low
Viewpoint 7: Views from Railway Terrace Overbridge	• No change to level of exposure from this location to the Proposal • There is some existing vegetation adjacent to the view to the Proposal • In combination with the distance and the type of changes proposed the Proposal will have negligible impact to the landscape character of this view	Negligible

6.2.3 Mitigation measures

In most cases for the potential receptors the railway infrastructure is already present or prominent. The Proposal would result in a negligible to moderate impacts for most of the selected viewpoints with the exception of Viewpoint 3: Views from York Street (Moderate). Viewpoint impact in York Street, and to a lesser degree in Hanbury Street, is due to proposed tree removal required to accommodate the new lift at the Railway Terrace entrance to the station.

Mitigation measures would be reviewed and revised 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 Visual Impact Assessment (RPS, 2018b) which are included in the list of proposed mitigation measures in Section 7.2, and include:

- a landscape plan highlighting planting and street-scape design should be prepared in alignment with the civil design, with the intent to provide some integration between the new Proposal and the existing / planned landscape character. This could include landscape design for visual mitigation for the Proposal lift shaft and footbridge – particular from the York Street viewpoint.
- the landscape plan should support and strengthen the existing landscape characters values of Waratah Station.
- additional consideration should be given to screening the existing stair infrastructure, or alternatively providing consistent maintenance of the areas beneath the stairs.
- the landscape plan should support and strengthen the existing landscape characters values of Waratah Station.
- new ancillary items including signage and balustrades should reflect the overall aesthetic of the existing station to ensure the character qualities of the station are retained - making reference to the Sydney Trains Station Components Guide, where possible.
- avoid unnecessary loss or damage to vegetation adjacent the rail corridor by protecting trees not proposed for removal prior to construction. This includes vegetation that makes a substantial and positive contribution to landscape character such as the mature native and exotic trees and vegetation to the station corridor boundary. Restore any areas that are impacted by construction with appropriate landscape treatments.

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 works and screening of compounds.

Refer to Section 7.2 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 (2018b). The assessment included:

- establishing the existing background noise levels in the vicinity of Waratah Station
- establishing the construction noise management levels and vibration limits that would apply to the upgrade works
- predicting environmental noise and vibration levels at nearby residential and other sensitive receivers due to the upgrade works
- considering potential noise from the operation of the upgraded Waratah Station
- identifying mitigation measures to reduce and manage noise and vibration impacts from the upgrade works 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 five noise catchment areas (NCA01-NCA05) as shown in Figure 21.

The locality is primarily characterised by low density residential receivers and outdoor recreation space. The area adjacent to the Proposal also includes the following:

- a childcare centre approximately 50 metres west of the Proposal on Platt Street
- a hotel and cafe approximately 30 metres to the north east of the Proposal on Hanbury Street
- a hotel approximately 112 metres to the north east of the Proposal on Hanbury Street
- a number of commercial receivers along Hanbury Street (approximately 90 metres) and Station Street (approximately 260 metres)
- an educational receiver approximately 256 metres south west of the Proposal.

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 L_{A90} 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 at 6 Braye Street Mayfield (shown as L01 in Figure 21) from 20 September 2018 to 2 October 2018. Rating background levels (RBLs) are reported as L_{A90} as shown in Table 9.

Table 9 Unattended noise monitoring results

Location	Address	Period[1]	Rating Background Level (L_{A90}) in dB	Ambient noise level (L_{Aeq}) in dB
L01	6 Braye Street	Daytime	49	59
		Evening	43	56
		Night time	36	54

The results of continuous unattended noise monitoring at this location show levels typical of an outer-city suburban noise environment with low night-time noise levels. Daytime noise levels are likely to be dominated by road traffic on adjacent roads and rail traffic.

Operator attended monitoring was also undertaken at the L01 (as shown in Figure 21) on 12 October 2018. Daytime ambient noise levels were observed to be largely controlled by traffic movements along adjacent roads.

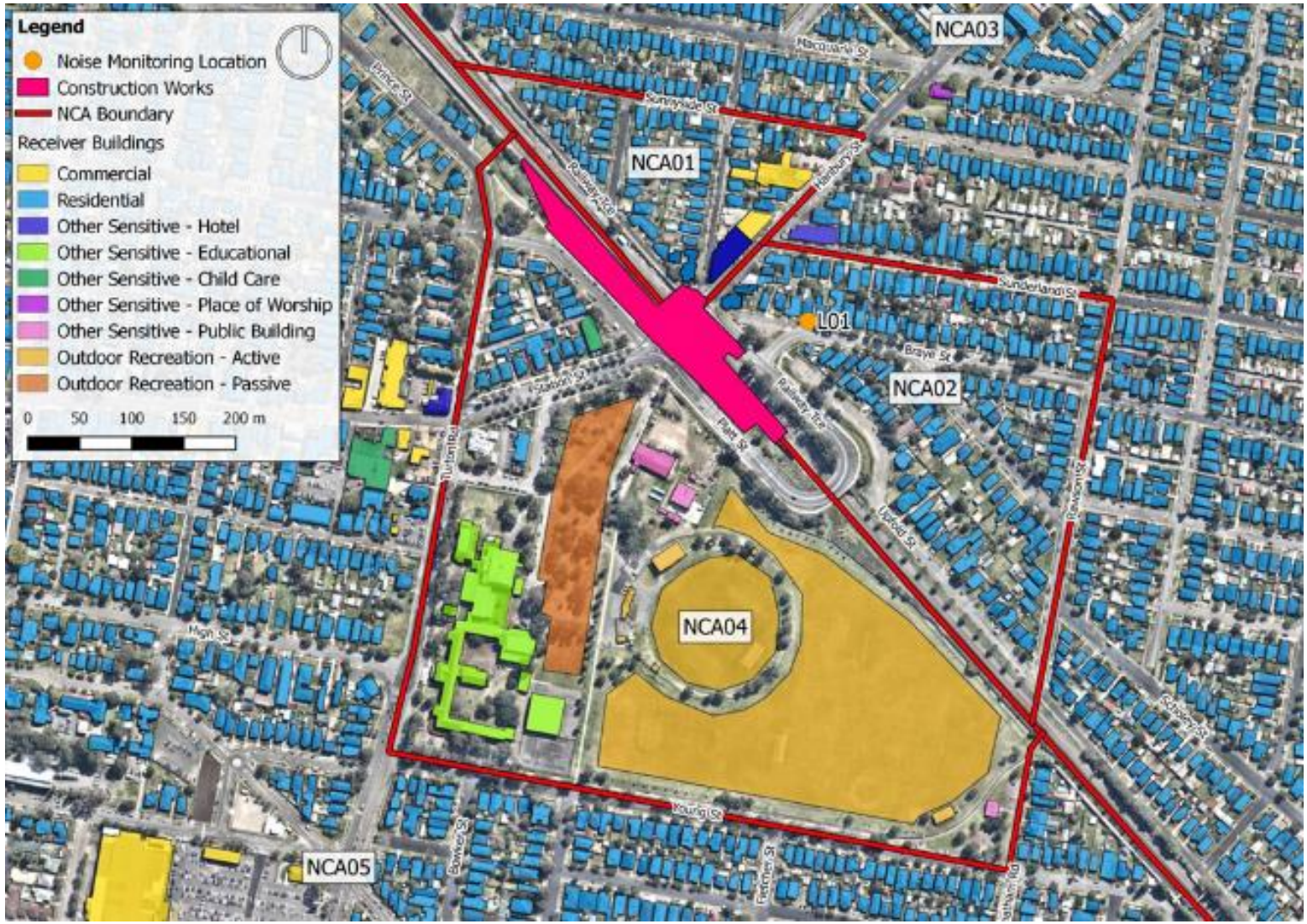

Figure 21 Proposal location and noise catchments

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 works.

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 daytime 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 works exceed 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 10.

Commercial receivers

The ICNG explains that due to the broad range of sensitivities that commercial or industrial land can have to noise from construction, the process of defining management levels is separated into three categories:

- industrial premises: external $L_{Aeq(15minute)}$ 75 dBA
- offices, retail outlets: external $L_{Aeq(15minute)}$ 70 dBA
- other businesses that may be very sensitive to noise, where the noise level is project specific as discussed below.

The external noise levels should be assessed at the most-affected occupied point of the premises.

Other sensitive land uses

The ICNG's quantitative assessment method provides NMLs for other sensitive land uses, such as educational institutes, hospital, medical facilities, etc. These land uses are considered potentially sensitive to construction noise only when the properties are in use. The ICNG NMLs for the other sensitive receivers identified in the Proposal area are shown in Table 10.

Other noise-sensitive receivers require separate project specific noise goals and, as per the guidance in the ICNG, NMLs for these receivers have been derived from the maximum internal levels in AS 2107.

The ICNG and AS2107 do not provide specific guideline noise levels for childcare centres. Childcare centres generally have internal play areas and sleeping areas. For these areas, an internal NML of 55 dBA $L_{Aeq(15minute)}$ has been adopted together with an internal NML of 40 dBA $L_{Aeq(15minute)}$ (when in use) for sleeping areas. On the assumption that windows and doors of childcare centres may be opened, an external NML of 65 dBA $L_{Aeq(15minute)}$ for play areas has been applied at the facade and would also be applicable to external play areas. For sleeping areas on the assumption that windows are open, the external NML is 50 dBA $L_{Aeq(15minute)}$ (refer Table 10).

The NML for Callaghan College, an educational sensitive receiver, is prescribed by the ICNG, and is an internal noise management level, therefore the corresponding external noise level (which the assessments are based on) has been determined on the assumption that a 10dB 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 which are based on the *NSW Roads Noise Policy* (Department of Environment, Climate Change and Water, 2011). Based on the Policy, the sleep disturbance criteria for residential receivers is a screening level of 50-55 dB(A) $L_{A1(1\ minute)}$ and an awakening reaction at 60 to 65 dB(A) $L_{A1(1\ minute)}$.

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).

Commercial receivers

The ICNG explains that due to the broad range of sensitivities that commercial or industrial land can have to noise from construction, the process of defining management levels is separated into three categories:

- industrial premises: external $L_{Aeq(15minute)}$ 75 dBA
- offices, retail outlets: external $L_{Aeq(15minute)}$ 70 dBA
- other businesses that may be very sensitive to noise, where the noise level is project specific as discussed below.

The external noise levels should be assessed at the most-affected occupied point of the premises.

Other sensitive land uses

The ICNG's quantitative assessment method provides NMLs for other sensitive land uses, such as educational institutes, hospital, medical facilities, etc. These land uses are considered potentially sensitive to construction noise only when the properties are in use. The ICNG NMLs for the other sensitive receivers identified in the Proposal area are shown in Table 10.

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Table 10 NMLs (dBA) for construction

NCA	Standard hours (RBL + 10dB)	Out of hours – daytime[1] (RBL + 5dB)	Out of hours – evening[1] (RBL + 5dB)	Out of hours – night time[1] (RBL + 5dB)	Sleep disturbance (RBL + 15dB)
NCA01-05 Residential	59	54	47	41	51
NCA01, 03 Commercial	70	70	N/A	N/A	N/A
NCA01, 03, 05 Other Sensitive (Hotel) [2]	N/A	N/A	N/A	45	60
NCA03 Other Sensitive (Place of Worship) [2]	55	55	55	N/A	N/A
NCA04 Other Sensitive (Public Building) [2]	60	60	60	N/A	N/A
NCA04 Other Sensitive (Educational) [2]	55	55	N/A	N/A	N/A
NCA04 Other Sensitive (Outdoor Active/Passive)	65	65	N/A	N/A	N/A
NCA05 Other Sensitive (Child Care) [2]	50	50	N/A	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

Note 2: ICNG internal goal + 10 dB as openable windows are assumed. An outside-to-inside attenuation of 10 dB is assumed.

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 daytime or night-time period.

The maximum criteria level is 0.4 $m/s^{1.75}$ for residences during the daytime and 0.26 $m/s^{1.75}$ during the night time. For educational facilities (when in use) the maximum criteria is 0.8 $m/s^{1.75.}$

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 11.

Table 11 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 12

Table 12 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

Note 1: More stringent conditions may apply to heritage or other sensitive structures

Operational noise criteria

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

- controlling intrusive noise levels in the short term
- maintaining noise amenity levels for particular land uses over the medium to long-term.

The *Noise Policy for Industry* sets out procedures for establishing the project intrusiveness $L_{Aeq(15minute)}$ and project amenity $L_{Aeq(period)}$ 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 13.

Table 13 Project trigger noise levels

NCA	Time of day	Intrusive[1] (dBA)	Amenity[2] (dBA)	Overall PTNL[3] (dBA)
NCA01-05	Day	54	53	**53**
	Evening	48	43	**43**
	Night	41	38	**38**

Note 1: Project intrusive noise level is RBL + 5dB
Note 2: Project amenity (period) noise level is the prescribed amenity criteria minus 5 dB
Note 3: Resulting PTNL is the lower of the project intrusive and project amenity noise levels

6.3.2 Potential impacts

c) Construction phase

Noise

To assess the potential impacts from the proposed works, the construction phases described in Chapter 3 were used to develop indicative construction scenarios comprising typical plant and equipment. The scenarios developed were:

- site investigations
- site establishment
- footbridge, stairs, lifts and ramp construction
- building and platform works
- interchange and finalisation works.

A 3D computer noise model was then used to predict the $L_{Aeq(15minute)}$ and $L_{A1(1minute)}$ 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 works are located at the nearest position within the works area to each receiver. The predictions are provided in Noise and Vibration Impact Assessment for the Proposal (SLR, 2018b). The impacts are summarised in Table 14.

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 works.

Table 14 Summary of predicted noise impacts

Works scenario	Summary of predictions	Timing and duration of works
Site investigations	• Most works associated with site investigations are not noisy works, however, two activities are predicted to generate NML exceedances • Potholing and geotechnical boreholes using drill rigs and concrete saws are the two activities that, if performed during a night time out of hours period, would generate exceedances of more than 20 dB. The activities would impact residential receivers in NCA01, NCA02 and NCA04 directly adjacent to Waratah Station on Railway Terrace and Platt Street that have direct line of sight to the Proposal activities	Standard day time hours and out of hours and rail shut down periods - day and night work. It is anticipated that the high noise level generating activities for site investigations would occur for a few days only in the initial rail shut down periods.
Site establishment	• Minor exceedances of the daytime NMLs are predicted for the nearest residential receivers in NCA01, NCA02 and NCA04 for most work activities for site establishment • High noise activities of noise wall modification and vegetation clearance using equipment such as	Standard day time hours and out of hours and rail shut down periods - day and night work.

Works scenario	Summary of predictions	Timing and duration of works
	concrete saws and chainsaws are predicted to generate high exceedances of the NMLs at receivers directly adjacent to the worksite in NCA01 • Exceedances of >20dB in NCA01 for the closest receivers are predicted if the high noise activities are undertaken during the night time out of hours period	
Footbridge, stairs, lifts and ramp construction	• Minor exceedances (10dB or less) of the standard daytime NMLs are predicted for the closest residential receivers in NCA03, NCA04 and NCA05 during most of the works in this scenario • Moderate NML exceedances (10-20dB) are predicted at residential receivers closest to the work sites in NCA01 and NCA02 during most of the works in this scenario • NML exceedances of 23dB and 20db are predicted at residential receivers located immediately adjacent to the construction activities in NCA01 and NCA02 respectively • During rail shut down (evening and night time periods) major night time NML exceedances of up to 37dB are predicted during the installation of the lift shafts • High exceedances (20db or more) of the night time NMLs are predicted at receivers within approximately 130 metres of the work for most of the works in this scenario	Standard day time hours and out of hours and rail shut down periods - day and night work.
Building and platform works	• Minor exceedances of the standard daytime NMLs (10db or less) are predicted for the nearest residential receivers in NCA03, NCA04, NCA05 during most of the works in this scenario • Moderate daytime NML exceedances (up to 15dB) are predicted for the nearest residential receivers in NCA01 and NCA02 during proposed platform building activities • During rail shut-down periods (evening and night time) NML exceedances of up to 30dB are predicted at the closest receivers due to the use of noise intensive equipment such as hammer drills and jackhammers	Standard day time hours and out of hours and rail shut down periods - day and night work.
Interchange and finalisation works	• Works in this scenario are predicted to comply with daytime NMLs for most nearby sensitive receivers • Minor day time NML exceedances (<10dB) are predicted at sensitive receivers closest to the proposal • During rail shut down (evening and night) periods NML exceedances of up to 24dB are predicted for the closest receivers in NCA01 and NCA02	Standard day time hours and out of hours and rail shut down periods - day and night work.

Overall, two residential receivers in NCA01 and NCA02 have been predicted to be highly impacted by noise intensive activities during construction. The modelled highly noise affected receivers are shown in Figure 22 and they are one residence on the corner of Railway Terrace and York Street and one residence on the corner of Railway Terrace and Hanbury Street. Relevant mitigation measures have been noted within Section 6.3.3 of this REF.

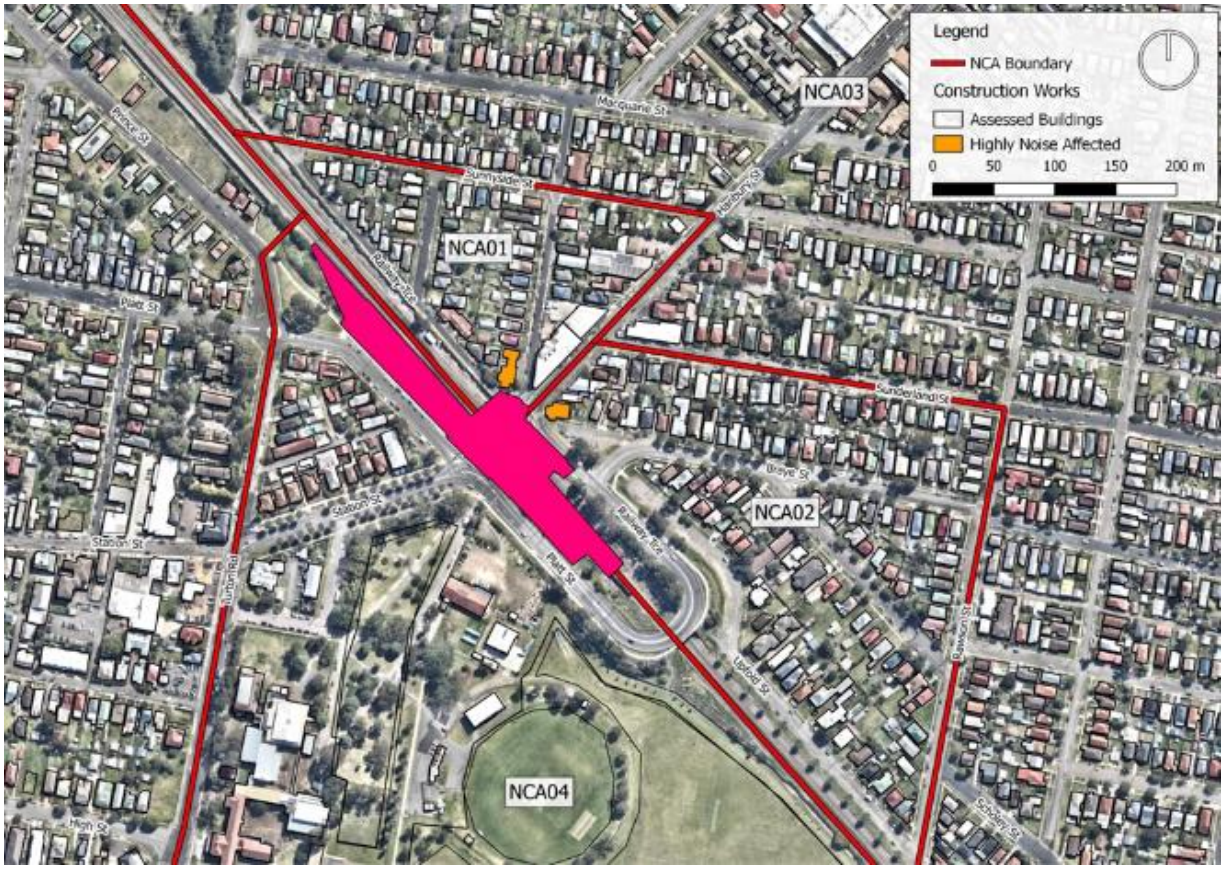

Figure 22 Highly noise affected receivers

Cumulative noise impacts

Cumulative noise impacts warrant assessment where more than one works scenario operates at the same time and in the same location such that the same receiver is impacted by noise from more than one works scenario. Generally, the proposed works are scheduled in consecutive phases and therefore cumulative noise impacts are not anticipated as the assessment is controlled by noise impacts from the individual phases (as assessed). Section 6.12 also notes no major development projects or development applications are listed in Waratah in the vicinity of the Proposal for approval at this time.

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 effect on existing road traffic noise levels and further consideration of noise impacts due to construction traffic is not required.

Vibration

a) Construction phase

Vibration intensive equipment is proposed during the service relocation works scenarios which include the use of jackhammers and bored piling. The drill rigs associated with bore holes are assumed to be non-percussive and non-vibration intensive.

Piling works are associated with several construction activities. For this assessment, it is assumed that piling works would be performed using non-vibration intensive bored piling. If the construction contractor elects to use an alternative piling method, the vibration levels generated by alternative plant may be higher than those presented in this assessment.

Human comfort

In relation to human comfort (response), the safe working distances in Table 12 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 below in Table 15.

Table 15 Indicative vibration levels at nearby receivers

Receiver	Approximate distance to works	Indicative vibration level (mm/s)[1]
NCA01	> 100 m	< 0.1 mm/s
NCA02	> 100 m	< 0.1 mm/s
NCA03	25 m	0.1 mm/s
NCA04	> 100 m	< 0.1 mm/s
Waratah Station	5 m - 35 m	1 mm/s - 0.1 mm/s

Note 1: Estimated from the safe working distances specified in TfNSW CNVS and assumed dense rock.

Heritage building impacts

Heritage structures identified within 300 metres of the Proposal are:

- Former Town Hall Hotel – 26 Station, Waratah (I667)
- Former Post Office – 22 Turton Road, Waratah (I669)
- Waratah Technology High School (I670).

These items are also shown in Figure 23. The closest of these items is the Former Post Office (22 Turton Road, Waratah, item I669) is approximately 190 metres from the Proposal.

Heritage buildings are 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, 2018b).

If vibration intensive works are required to be undertaken in close proximity to other potentially vibration sensitive structures such as the nearby stormwater channel vibration monitoring should be undertaken to ensure acceptable levels of vibration are satisfied.

The anticipated vibration impacts of the Proposal are summarised in Table 16.

Table 16 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 works are 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 works, structural or cosmetic damage from vibration intensive work is considered unlikely for most adjacent receivers. However, should vibration intensive activities be required in close proximity to the nearby stormwater channel there is potential for damage to occur,	Intermittent during piling and jackhammer use scenarios.
Heritage building impacts	The separation and distance between the proposed equipment identified heritage items would be sufficient to mitigate vibration levels from the use of identified equipment.	Intermittent during piling and jackhammer scenarios.

b) Operational phase

The key identified fixed noise sources associated with the station upgrade are the proposed new lifts, the amended SSER and the upgraded public address system. As shown in Figure 10 the lifts would be installed at each entrance to the station and on Platform 1. The SSER is located on Platform 2 and the exact location of the upgraded elements of the public address system is to be determined during detailed design.

At this stage of the design a specific lift system has not been selected, and therefore the operational noise emissions cannot be definitively predicted at this point in time. However, given that these noise sources generally have relatively low noise emissions, it is anticipated that operating noise of the lifts could be relatively easily mitigated if required during the detailed design phase of the Proposal. Similarly, because it is located inside a building, the operating noise that may be generated by equipment in the SSER could be easily mitigated through the selection of appropriate equipment. The applicable criteria for operational noise (i.e. PTNLs) for the new station lift and any other operational equipment are included in Table 13.

The station public address system would be designed to meet the requirements of Sydney Trains Public Address Systems Standard (*F2013/620*) and would include an auto-ranging feature to minimise disruption to nearby sensitive receivers.

6.3.3 Mitigation measures

Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Construction Noise and Vibration Strategy* (TfNSW, 2018b) and the Noise and Vibration Impact Assessment (SLR, 2018b) 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 construction 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 works. The CNVMP would also detail requirements for managing potential vibration impacts to structures through monitoring and safe working distances.

Two residential receivers have been identified as potentially highly noise affected (refer to Figure 22). TfNSW would communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that would be provided.

During the construction phase of the Proposal a temporary noise wall would be constructed in the rail corridor adjacent to the new lift shaft location on Hanbury Street. The temporary noise wall would ensure that existing noise mitigation is not compromised in this location. On completion of lift construction in this location the permanent noise wall would be tied into the new lift shaft and the temporary noise wall would be removed.

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

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

6.4 Indigenous heritage

6.4.1 Existing environment

An Aboriginal Heritage Information Management Sydney (AHIMS) search was undertaken for the area covered by the Proposal (the area around Waratah Station) plus a 200-metre radius, on 9 October 2018. There were no registered Aboriginal sites within the search area (200m radius).

The extensive landscape modification and high level of disturbance that has occurred across the Proposal site suggests that intact evidence of Aboriginal land use and culturally sensitive buried landforms is unlikely to occur within the boundaries of the Proposal site. Similarly, the nature of the proposed works (only a small amount of ground disturbance) would suggest that there is low potential for Aboriginal objects to be impacted.

6.4.2 Potential impacts

a) Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbance activities which has the potential to impact Indigenous sites, if present. No known Indigenous heritage items are located in the vicinity of the Proposal site and the potential for unknown items is considered to be low, 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 unforeseen Indigenous objects were to be uncovered during development, work would cease in the vicinity of the find and the TfNSW Project Manager and TfNSW Environment and Planning Manager are to be notified immediately to assist in co-ordinating next steps which are likely to involve consultation with an archaeologist, OEH and the Local Aboriginal Land Council/s. If human remains are found, works would cease, the site would be secured and the NSW Police and OEH would be notified.

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

6.5 Non-Indigenous heritage

6.5.1 Existing environment

A desktop search of historic registers including, the World Heritage List, Commonwealth Heritage List, National Heritage List, the Register of the National Estate (non-statutory archive), NSW State Heritage Register (SHR), RailCorp's (Sydney Trains') Section 170 Heritage Conservation Register and the Newcastle LEP (2012) was undertaken for the area surrounding the Proposal.

Listed heritage items

The desktop search identified that Waratah Station is not listed on the World, Commonwealth or National Heritage Lists, the Register of the National Estate, SHR, Section 170 RailCorp (Sydney Trains) Heritage Conservation Register or the Newcastle LEP.

The closest listed heritage site to the Proposal is Waratah Park and Palms, located to the south west of Platt Street. The Proposal is unlikely to impact on this site. Heritage items in the vicinity of the Proposal are listed in Table 17 and shown in Figure 23.

Table 17 Heritage items in the vicinity of the Proposal

Name/ Item	Listing and significance	Location in relation to Waratah Station (approx.)
Waratah Park and Station Street Palms	LEP, local	35 metres south-west
Waratah School of Arts	LEP, local	150 metres west
Former Waratah Post Office	LEP, local	190 metres west
Waratah Technology High School	LEP, local	190 metres south-west
Town Hall Hotel	LEP, local	220 metres west

Figure 23 Heritage items

Historical background

The suburb of Waratah was principally developed as an industrial base for a colliery. The town eventually became a large incorporated municipality.

A rail line between Newcastle and Maitland was first proposed in 1853 by the Hunter River Railway Company which was eventually bought by the NSW Government. The Newcastle railway line opened in 1857. Development and interest in the Hunter region increased with the boom of coal mining in the area.

To assist in servicing growth in the area, Waratah Station was opened on 9 March 1858. The station is on the Main North Line which was formerly on the main rail line to Brisbane. The station has been in use since its opening and it has been expanded and upgraded over that period to cater for both passenger service and freight line needs. Figure 24 shows Waratah station in circa 1910.

The station is currently serviced by the Hunter Line which is a passenger train service to Newcastle, Maitland, Scone and Dungog. The Hunter line was the last in Australia to have a regular steam hauled passenger service.

Archaeological heritage

No archaeological elements on Waratah Station have been identified at this stage, and the station and its immediate surrounds have been subject to significant modification for road, underground utility and residential development.

Figure 24 Waratah Station c. 1910 (State Records & Archives, 2018)

6.5.2 Potential impacts

a) Construction phase

This section considers the potential heritage impacts associated with construction of the Proposal.

There would be no impacts to the heritage items identified in Table 17 due to the nature and scale of the proposed works and distance to these heritage items. Accordingly, no further assessment of these items is required.

However, the Proposal area has been associated with railway activities since 1858, and although a review of known heritage items has been undertaken, unknown / unrecorded items may become evident during excavation activities.

b) Operational phase

There would be no impacts to the identified heritage items during the operation phase of the Proposal.

6.5.3 Mitigation measures

Potential impacts to non-Indigenous heritage during construction would be managed through the implementation of the CEMP. The CEMP would prescribe management measures to ensure the nearby local heritage items such as Waratah Park and the Station Street Palms are not inadvertently damaged or impacted by the Proposal and to ensure that any unexpected archaeological finds are managed appropriately.

Where possible, original elements of the station, such as the decorative posts at the base of stairs would be retained or repurposed.

It is also recommended that an archaeological review is undertaken during detailed design to determine the potential for subsurface archaeological items (and their significance), and whether any permits are required under the *Heritage Act 1977* prior to the commencement of construction. This review should consider historical sources such as parish maps and Sydney Trains Plan Room drawings.

The CEMP would include the following measures:

- The site induction would include a general heritage component and would be provided to all on-site staff and contractors involved in the project and would clearly outline contractor responsibilities in relation to heritage
- inclusion of stop-work procedures in the unlikely event that intact archaeological relics or deposits are encountered in accordance with TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2016a).

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

6.6 Socio-economic impacts

6.6.1 Existing environment

In 2016, the suburb of Waratah was home to around 4,491 people, with a median age 39 (Australian Bureau of Statistics, 2016). This population represents approximately 2.8 per cent of the 155,411 people that live in the Newcastle Local Government Area in 2016 (Australian Bureau of Statistics, 2016).

The most common occupations in Waratah in 2016 included Professionals (25.3 per cent), followed by Community and Personal Service Workers, Clerical and Administrative Workers, Technicians and Trades Workers, and Sales Workers. Approximately 67 percent of residents travelled to work by car in 2016. Conversely, approximately 4.5 per cent of residents used public transport to travel to work.

The land use surrounding Waratah Station comprises a mix of residential, commercial and recreational uses as describe in Section 1.3. There are number of commercial facilities to the north-east of the Station. Waratah town centre is close by (approximately 230 metres), centred around Station Street, and includes a child play and development centre. To the immediate north, east and north west, the land use comprises residential, predominately low-density houses.

The recreational area to the south west features Waratah Park and Gardens, and a community hall with associated facilities operated under Hunter Multicultural Communities (non-profit organisation).

The nearest non-residential facilities include:

- recreational areas including parks and ovals (30 metres south west of the Proposal)
- Tillys Play and Development Centre (40 metres west of the Proposal)
- street fronting retail including coffee shop, hair salon etc (50 metres north of the Proposal)
- Hunter Multicultural Communities Centre (91 metres south of the Proposal)
- Tillys College of Childcare (323 metres west of the Proposal)
- St Johns Presbyterian Church (326 metres north east of the Proposal)
- Callaghan College (330 metres south west of the Proposal)
- The Royal Inn (439 metres west of the Proposal)
- Waratah Village retail (586 metres south west of the Proposal)
- Waratah Police Station (758 metres south west of the Proposal)

It is expected that the existing environment summarised above would not change in the foreseeable future.

6.6.2 Potential impacts

a) Construction phase

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

- temporary changes to accessing the station
- temporary closure of toilets and waiting rooms

- minor increase in traffic including truck movements delivering site materials, plant and equipment
- minor increase in economic activity in the area due to construction contractor personnel patronage
- construction noise, vibration, dust and visual impacts.

Refer to other relevant sections for more detail of the potential traffic (Section 6.1.2), visual (Section 6.2.2) and noise impacts (Section 6.3.2) arising from the construction of the Proposal and proposed management strategies.

b) Operational phase

It is anticipated that the Proposal would provide positive socio-economic benefits to Waratah and the wider area including:

- improved accessibility for Waratah Station customers due to the provision of new lifts and new accessible path from the station entrances to the platforms
- improved customer amenity and facilities at the station including a Family Accessible Toilet, ambulant toilet, CCTV, improved wayfinding and new lighting
- potential increased use of public transport to and from Waratah.

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 Plan (to be developed by the Construction Contractor prior to construction) which would identify potential stakeholders and the best-practice methods for consultation with these groups during construction. The Plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible
- informing the community of construction progress, activities and impacts in accordance with the Community Liaison 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.

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

6.7 Biodiversity

A flora and fauna impact assessment was undertaken by RPS to describe the ecological values of the Proposal area including potential habitat for species listed under the *Biodiversity Conservation Act 2016* (BC Act) and/or the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). The impact assessment reports on the significance of potential impacts on identified ecological aspects of the Proposal area.

An arboricultural assessment was undertaken by Allied Tree Consultancy to identify the trees present within the Proposal area. A site inspection was undertaken on 3 October 2018 by an ecologist and a qualified arborist. Trees and potential fauna habitats within and adjacent to the Proposal area were assessed.

Information about the ecological values of the Proposal area and its surrounds was also derived from the following sources:

- OEH Atlas of NSW Wildlife (accessed October 2018)
- EPBC Protected Matters Search (accessed October 2018)
- Local vegetation mapping
- Mitchell landscapes (NPWS 2003)
- IBRA Region and subregion mapping (IBRA 7).

The latest aerial photography was also reviewed prior to the site inspection.

6.7.1 Existing environment

Landscape context

Waratah Station is located within an urban area which has been modified and disturbed over a long period of time. Most of the native vegetation of the area has been cleared and replaced by a landscaping including native and exotic flora. Vegetation within the Proposal area consists of:

- rows of trees along the edge of the rail corridor with largely exotic understorey
- rows of planted trees along the adjacent road reserves native and exotic species
- ornamental screening plants covering the rail noise wall
- large grassed areas and planted trees within Waratah Park predominantly exotic species
- an avenue of Palm Trees along Station Street
- residential gardens of native and exotic plantings

Native species observed in the Proposal area are:

- Swamp Oak (*Casuarina glauca*)
- Forest Redgum (*Eucalyptus tereticornis*)
- *Dianella caerulea* – within a station garden bed off Platt Street (as shown in Figure 25)
- *Lomandra longifola* – within a station garden bed off Platt Street (also shown in Figure 25)
- Magenta Lilly Pilly (*Syzigium paniculatum*) (location shown in Figure 26)
- *Callistemon salignus* (location shown in Figure 26)

Figure 25 Existing garden beds containing *Dianella caerulea* and *Lomandra longifolia*

Threatened species and ecological communities

The EPBC Act protected matters search tool report identified four listed Threatened Ecological Communities that may occur in the Proposal area. These communities are listed in Table 18.

Table 18 Threatened Ecological Communities that may occur in the Proposal area

Threatened ecological community	EPBC Act Status
Central Hunter Valley eucalypt forest and woodland	Critically Endangered
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community	Endangered
Lowland Rainforest of Subtropical Australia	Critically Endangered
Subtropical and Temperate Coastal Saltmarsh	Vulnerable

However, the vegetation within the Proposal area does not conform in species composition, structure or habitat with an Endangered Ecological Community (EEC) under the BC Act or EPBC Act.

Threatened flora species

The presence of one threatened species, *Syzygium paniculatum* (Magenta Lilly Pilly), was observed and is coincident with the footprint of the proposed northern lift. This species is listed as endangered under the BC Act and vulnerable under the EPBC Act. The presence of this species at this location is likely related to its inclusion in historical landscape plantings (circa 1986) and is not representative of a natural occurrence.

There was no evidence of any recruitment beneath the canopy of this species; further corroborating the suspected 'planted' status of the tree. While the removal of this tree signifies the loss of a listed threatened species, it is considered that its occurrence is not natural nor representative of a viable population and, as such, its removal cannot be considered a significant impact.

The database search identified 15 threatened flora species within the search radius of Waratah Station With the exception of the tree (*Syzygium paniculatum* (Magenta Lilly Pilly)) identified during the site inspection none of the threatened flora was recorded in the Proposal area and the surrounding landscaped areas do not provide appropriate habitat for threatened flora.

Fauna

A total of five fauna species were identified during opportunistic surveys on-site. These include:

- Australian Magpie (*Cracticus tibicen*)
- Noisy Miner (*Manorina melanocephala*)
- Rainbow Lorikeet (*Trichoglossus moluccanus*)
- Sulphur Crested Cockatoo (*Cacatua galerita*)
- Eastern Water Skink (*Eulamprus quoyii*).

None of these is a listed threatened species.

Threatened fauna species

The Protected Matters database search identified 128 fauna species that may occur within the search radius of the Proposal area. The search included marine and migratory species. No habitat appropriate for marine and migratory species was identified within the Proposal area therefore no further assessment of marine and migratory fauna species is required.

Terrestrial Habitat

No important fauna habitat features such as hollow-bearing trees, fallen logs or termite mounds were observed in the area to be impacted by the Proposal. However, seasonal nectar resources produced by mature Forest Redgum and Magenta Lilly Pilly could be used for foraging purposes by the Grey-headed Flying Fox (*Pteropus poliocephalus*).

Exotic and invasive species

One weed of National Significance, as listed in the NSW Department of Primary Industries (DPI) website, was identified on site: Fireweed (*Senecio madagascariensis*).

Other exotic species that were identified within the Proposal area are:

- Western Australian Golden Wattle (*Acacia saligna*)
- Pink pavonia *(Pavonia hastata).*

Figure 26 Vegetation cover to be impacted by the Proposal

6.7.2 Potential impacts

a) Construction phase

Direct impacts

The Proposal has been designed so that the clearing of mature trees is minimised. The preferred options chosen minimises the amount of tree removal required within design constraints. It is currently proposed that there would be removal of one mature *Syzigium paniculatum* and one mature *Callistemon salignus* adjacent to the noise wall on Railway Terrace to accommodate the installation of the new lift, waiting bay and accessible path. The removal of these trees is not considered to have an impact on the overall ecological values of the area.

There would also be removal of a garden bed, currently planted with *Dianella caerulea* and *Lomandra longifolia* adjacent to Platform 2 however, as the garden bed is small and contains only one species of plant which contribute only to the aesthetic amenity of the station it is not considered to contribute to the ecological makeup of the Proposal area. Therefore, the garden bed has not been considered further as part of the flora and fauna assessment.

Indirect impacts

The most likely indirect impact arising from this 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 works that involve 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. Important habitat features such as hollow-bearing trees, fallen logs or termite mounds were not located in the impact area and would not be adversely impacted by the Proposal.

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

Exotic flora

Due to equipment use and soil disturbance, there is the potential for the introduction of weeds. Also, without the use of appropriate weed management protocols, the Proposal has the potential to facilitate the spread of weeds into adjoining areas.

Key Threatening Processes

Key Threatening Processes (KTPs) are listed under Schedule 4 of the BC Act and EPBC Act. There are no relevant KTPs that have the potential to affect biodiversity values within the Proposal area. The proposed tree 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:

- should the detailed design or onsite works determine the need to remove or trim any additional trees, the Construction Contractor is to complete the TfNSW Tree Removal Application Form and submit it to TfNSW for approval.
- works within proximity to existing native trees should 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 would require an arborist to undertake further assessment before proceeding.
- eight trees (Magenta Lilly Pilly or similar species to provide foraging habitat for the Grey-headed Flying Fox) are recommended to be planted in an appropriate place within the Proposal area or directly adjacent to replace the removed trees
- offsets and/or landscaping would be undertaken in accordance with the TfNSW Vegetation Offset Guide (TfNSW, 2016c) and in consultation with Newcastle City Council, and/or the owner of the land upon which the vegetation is to be planted. Where possible, attempts must be made to apply all or part of the offsetting to the station precinct. Any additional clearing would also require assessment and tree offset planting.
- weed control measures, consistent with the TfNSW *Weed Management and Disposal Guideline* (TfNSW, 2015), 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 Section 7.2 for a full list of proposed mitigation measures.

6.8 Contamination, landform, geology and soils

6.8.1 Existing environment

Geology and soils

Waratah Station is situated within the Hamilton soil landscape. The landscape is level to gently undulating, well-drained plan on Quaternary deposits in the Hunter Plain Region. The soil profile is deep (>15cm), well drained week Podzols, with some deep (>100cm) well drained Brown Podzolic Soils on fans. Strong acidity, non-cohesive.

The geology is characterised by quaternary sand overlying clay deposits. Sediment depth is up to 38 metres, comprising one to three metres of sand which is generally underlain by stiff estuarine clay. The area has been completely urbanised and features areas of fill.

Nearby soil profile data indicates the soil type for the Proposal area is likely to be Yellow Podzolic Soil (GSG) which is moderately permeable and has moderately well drained hydrology. Runoff from this soil would be moderate.

Acid sulfate soils

A review of the Australian Soil Resource Information System (ASRIS) indicated that there is a low probability of occurrence for Acid Sulfate Soils (ASS) to be present within the vicinity of the Proposal site.

However, the Newcastle LEP 2012 maps classify the site as Class 4. For this class of land the LEP requires additional actions when:

> "*works more than 2 metres below the natural ground surface" or*
>
> *"works by which the water table is likely to be lowered more than 2 metres below natural ground surface"*

The excavations for the lift shafts would be greater than two metres below the ground surface (natural level not known at this stage). Further on site investigations would be undertaken to confirm if works are likely to affect ASS. In the event that ASS would be disturbed, the Construction Contractor would prepare and implement an ASS Management Plan in accordance with the requirements of the *Acid Sulfate Soils Manual* (Acid Sulfate Soils Management Advisory Committee, 1998), prior to the commencement of any works which are likely to disturb ASS.

Contamination

Australian Standard *AS 448231-2005- 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 and may be present at Waratah Station:

- hydrocarbons
- arsenic
- phenolics
- heavy metals
- nitrates and ammonia.

Given the historical use of the station as a rail corridor, there is potential for contaminants to be present within the soils underlying the station. Historic activities associated with rail corridors that have the potential to result in contamination include the introduction of fill materials including ash, fuel or oil spills and accidental leaks or spills from maintenance and operational activities. Given the age of the building, there is also potential for asbestos materials and lead paint to be encountered.

A search of the public register of notices issued by the NSW EPA under the CLM Act was conducted on 11 October 2018. Twenty-one (21) sites were identified within the Newcastle City LGA as being declared 'Significantly Contaminated Land', however no sites were within two kilometres of the Proposal site. There are also no petrol stations or heavy industry currently located in the immediate vicinity of the site.

6.8.2 Potential impacts

a) Construction phase

Soil disturbance

Excavation and other earthworks are described in more detail in Section 3.1.8, 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.

Effective management of these impacts is particularly important due to the stormwater channel within the Proposal area. It is however 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).

Contamination

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 refurbishment of the station building. 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.

Historic rail operations of the Proposal area and current rail operations mean that all soils and all site runoff from the Proposal area has the potential to be contaminated and should be assumed to be contaminated unless testing of excavated material and water on site is determined to be otherwise by appropriate testing in accordance with the TfNSW *Water Discharge and Reuse Guideline* (TfNSW, 2017d) and the EPA *Waste Classification Guidelines* (EPA, 2014).

The risk of impacts from contamination (if any) on human health (workers and the general public) from the construction activities is considered to be low due to limited ground disturbance required for the Proposed works. The risk of impacts from contamination (if any) on receiving environments form the construction activities is also considered to be low.

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 TfNSW 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

contamination and waste would be managed in accordance with relevant legislation and guidelines.

If required, an ASS management plan would be prepared in accordance with the *Acid Sulfate Soils Manual* (Acid Sulfate Soils Management Advisory Committee, 1998) to ensure that the risks associated with the identification and management of ASS and potential acid sulfate soils (PASS).

Appropriate mitigation measures would be implemented to manage hazardous substances during demolition works. 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

The landform and natural drainage patterns of Newcastle result from two major influences. Firstly, the Hunter River and associated flat, poorly drained alluvial and estuarine deposits and secondly, the outcrop of sedimentary rocks forming a series of ridges and spurs primarily along the southern sector of the LGA boundary.

Surface water

Waratah Station is located in the Hunter River Catchment and is situated on flat terrain, approximately 6 metres elevation above sea level. Surface water at the site infiltrates into the ground where possible and drains into existing kerbside drainage pits. There are no natural waterways in close proximity to the site. The existing surface water features in the vicinity of the Proposal area include:

- an open council stormwater channel located adjacent to Platt Street and roughly parallel to Platform 2 and the western rail line
- kerbside road drainage on Railway Terrace, Platt Street

Water generally drains from the north west to the south east across the Proposal area. Drainage is heavily influenced by the presence of the rail corridor including four rail tracks as well as the presence of the stormwater channel.

Groundwater

A search of the WaterNSW real time database was undertaken on 9 October 2018. There are no registered groundwater (telemetered) bores in the Newcastle urban area.

There are no groundwater dependant ecosystems in the vicinity of the Proposal area according to the Groundwater Dependant Ecosystems Atlas (BOM 2018).

Given that the area of the Proposal is serviced by a reticulated water supply, it is considered unlikely that the groundwater in the immediate vicinity of the Proposal area would be utilised for drinking water purposes. Given the nature of the surrounding land uses (residential, commercial), it is unlikely that the groundwater would be used for irrigation or domestic purposes.

Flooding

The urbanisation of the catchment has resulted in major irreversible impacts on hydrology, including flash flooding as a result of increased impervious surfaces.

Newcastle City Council flood mapping indicates that most of the Proposal area has a very low flood risk and is outside of the 1% Annual Exceedance Probability (AEP) event, where larger less frequent floods up to the Probable Maximum Flood can occur.

However, a small portion of the site (on the south west side) has a low to medium flood risk. Platt Street is however classified as a high-risk flood area, where deep and fast-moving floodwater can occur – which is associated with the existing ground water culvert. (Refer to Figure 27). The high and medium flooding risk areas intersect with the proposed location of the construction compound.

The flood environment at the site is typically flash flooding - flooding from local catchments and high rainfall. Figure 27 shows the following:

- High risk- deep and fast-moving floodwater in a 1% AEP event
- Medium risk- deep and slow-moving floodwater in a 1% AEP event
- Low risk- shallow and slow moving floodwater in a 1% AEP event
- Very low risk- outside the 1% AEP flood prone area.

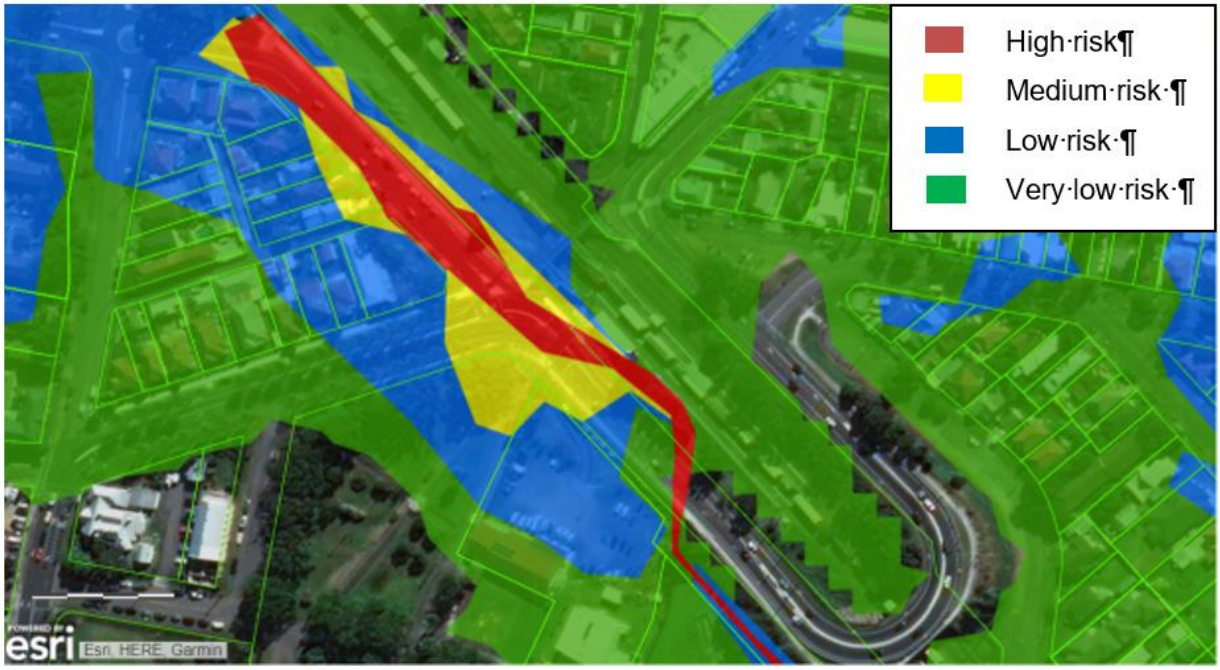

Figure 27 Newcastle City Council flood risk mapping (source: Newcastle City Council)

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 the adjacent stormwater drain and flow into the connected waterways. Activities which would disturb soil during construction work also have the potential to impact on local water quality as a result of erosion and run off sedimentation.

Direct impacts to the stormwater network may occur from demolition and construction activities through damaged infrastructure and pollutants entering waterways. Appropriate controls would be detailed in the CEMP and established to ensure the drainage points are adequately protected during construction activities.

In an extreme rainfall event, flooding may impact on construction activities. Moderate to heavy wet weather events may cause localised flash flooding through the Proposal area, particularly the proposed construction compound, which would likely result in soil erosion and sedimentation impacts and downstream waterway impacts. Works would need to ensure that stormwater drains are kept unobstructed during construction and that all reasonable mitigation measures are implemented within the construction compound.

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

b) Operational phase

The Proposal is unlikely to have a significant impact upon the hydrology of the surrounding area. Based on the preliminary design, the overall impervious area would slightly increase for the construction of lifts and access ramps, however would not block any overland flow paths. Alterations to the surface water flows due to a minor increase in hardstand areas would likely be within the capacity of the existing stormwater network and as such, impacts would be minor.

The detailed design would take stormwater management into consideration and consultation would be undertaken with Newcastle City Council regarding stormwater drainage. The existing drainage channel running parallel to Platt Street would not be impacted.

Additionally, given that the Proposal features structures predominately above ground level, it is unlikely that stormwater runoff will impact the operation of the station. In high rainfall events water may pool along the roadside, in particularly the corner of Station Street and Railway Terrace (shown as high flood risk in Figure 27).

6.9.3 Mitigation measures

During detailed design, further hydrological assessment would be undertaken during to determine final drainage arrangements and any associated flooding risks (an assessment has been completed for the concept design stage only).

A Construction Flood Risk Management Plan would be prepared and implemented for the proposal to manage flooding risk to the project during construction. The plan would identify procedures for monitoring weather conditions and making the site safe and minimising pollution potential prior to potential flood events.

As noted in Section 6.8.3, an Erosion and Sediment Control Plan 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 TfNSW's *Water Discharge and Reuse Guideline* (TfNSW, 2017d).

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

6.10 Air quality

6.10.1 Existing environment

Based on the land uses surrounding the Proposal area, the existing air quality is considered to be characteristic of an urban environment. Receivers at the Proposal area include:

- staff and customers of Waratah Station
- residents of surrounding houses
- staff and visitors of Hunter Multicultural Communities
- users of Waratah Park
- staff and customers of Tillys Play and Development Centre
- staff and customers of Portafilter Coffee Shop.

The Proposal area is within the Lower Hunter and Central Coast air quality monitoring network. An air quality monitoring station is located in Mayfield. Air quality at Mayfield is likely to be similar to that of the Proposal area in Waratah. However, Waratah air quality may also be influenced by the presence of the rail line. Air quality was reported to be generally good within the Newcastle area from March to May 2018. Seasonal reporting of the Newcastle area includes data from the Mayfield monitoring station.

A search of the National Pollutant Inventory undertaken on 10 October 2018 for the 2016 to 2017 reporting period, identified 28 registered polluting facilities within the Newcastle LGA. Of these facilities, Moly-Cop Waratah is the closest which is located about 1 kilometre from the Proposal site. Moly-Cop is a large manufacturer and supplier of grinding media used for mining operations, mining chemicals used for mineral processing and rail consumables. The Moly-Cop Steel Mill in Waratah regularly monitors and reports furnace stack emissions to show compliance against the sites EPA Licence limits.

There are four facilities located within 2.5 kilometres of the Proposal site but none of these sites are considered to impact the Proposal site significantly in relation to air quality.

The main contributor to air quality surrounding the Proposal is emissions from motor vehicles on the surrounding road network and the diesel freight trains on the adjoining rail corridor.

6.10.2 Potential impacts

a) Construction phase

The key air quality impacts that have the potential to occur during construction would be temporary impacts associated with dust particles and emissions of carbon monoxide, sulphur dioxide, particulate matter, nitrous oxides, volatile organic compounds and other substances associated with excavation and the combustion of diesel fuel and petrol from construction plant and equipment.

Anticipated sources of dust and dust-generating activities include:

- excavation for the lift shaft and canopy
- trenching and excavation for footpath and roadworks, relocation of services, drainage works, installation of lighting, kerb ramps
- removal of existing billboards and vegetation
- upgrading of surrounding interchange facilities
- installation of new noise wall and platform regrading

- stockpiling activities
- loading and transfer of materials from trucks
- other general construction activities
- surface disturbance works within the construction compound which is currently a combination of gravel and grass.

The Proposal would have a minimal impact on air quality as it would not involve extensive excavation or other ground disturbance with the potential to generate significant quantities of dust and other emissions. Appropriate measures would be established to manage dust and emissions from demolition and trenching works.

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 implementation of standard air quality management controls (listed in Section 7.2) would minimise the potential for air quality impacts.

b) Operational phase

Overall impacts on air quality during the operation of the Proposal would be negligible as the Proposal would not result in a change in land use. Also, as the Proposal would increase access to public transport, a subsequent increase in use of public transport has the potential to reduce private vehicle related emissions in the long-term.

6.10.3 Mitigation measures

Section 7.2 provides a list of mitigation measures that are proposed to manage air quality during construction. They are aimed around maintaining and operating plant and equipment efficiently and implementing measures for dust suppressing including watering, covering loads and appropriate management of tracked dirt/mud on vehicles. Such measures would be included in the CEMP to be prepared for the Proposal.

6.11 Other impacts

6.11.1 Waste

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

- asphalt and concrete
- surplus building materials
- excavated spoil
- building materials wastes (including metals, timbers, plastics, packaging, fencing etc.)
- electrical wiring and conduit waste (from electrical connections)
- hazardous chemical wastes
- green waste (tree removal)
- demolition waste from the existing bathrooms, waiting area and station operations room amendment
- general waste, including food scraps generated by construction workers.

Appropriate planning of construction activities would ensure that the volume of surplus materials is minimised. Waste management would be undertaken in accordance with the WARR Act and a Waste Management Plan would be prepared that would identify all potential waste streams associated with the works and outline methods of disposal, reuse and recycling as well as other onsite waste management practices.

The handling, storage, transport and disposal of asbestos and hazardous waste (including lead waste) would be in accordance with the requirements of relevant EPA and Safe Work NSW guidelines.

The application of the *NSW Sustainable Design Guidelines - Version 4.0* (TfNSW, 2017b) would also result in waste management targets to be developed for the Proposal and would include reuse and recycling.

Waste management targets in accordance with the *Infrastructure Sustainability Rating Scheme – v.1.2* (ISCA, 2018) would be developed for the Proposal and would include reuse and recycling.

The Proposal would not result in changes to operations waste management arrangements.

Refer to Section 7.2 for a full list of proposed mitigation measures. All mitigation measures are to be incorporated into the CEMP.

6.11.2 Utilities

Investigations suggest that there are numerous electrical, drainage, gas, communication and signalling services within the footprint of the Proposal area. The services impacted by the Proposal would need to be relocated or protected to enable Waratah Station to remain operational during the redevelopment.

Any services impacted by the Proposal would need to be relocated to enable Waratah Station to remain operational during the upgrade.

All services should be accurately located prior to any detailed design development and mechanical excavation by using service locating (non-destructive digging). It is expected that the signal services containment troughing would require diversion due to platform widening.

The lift accessed from Platt Street would be installed adjacent to the existing overhead wiring (33kV aerial feeders). The lift installation would ensure that all required protection measures and safe working distances are implemented during construction.

6.12 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in close proximity to one another. The impacts may be caused by both construction and operational activities and can result in a greater impact to the surrounding area than would be expected if each project was undertaken in isolation. 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, the Hunter and Central Coast Regional Planning Panel Development and Planning Register, and Newcastle City Council Development Application Register on 11 October 2018 identified no developments occurring within the vicinity (within one kilometre) of Waratah Station.

The closest major development proposals are to the north within the industrial area of Mayfield and coal terminal, including: Mayfield West Resource Recovery Facility (1a McIntosh Drive), Kooragang Coal Terminal modification (Kooragang Island) and modification to Stolthaven Fuel Storage terminal (Steelworks Road, Mayfield).

During construction, the works would be coordinated with any other construction activities in the area where required. Consultation and liaison would occur with Newcastle City Council, RailCorp/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 the mitigation measures identified in Chapter 7 are implemented.

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

6.13 Climate change and sustainability

6.13.1 Greenhouse gas emissions

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

The detailed design process would undertake an AS 14064-2 (Greenhouse Gases - project level) compliant carbon footprinting exercise in accordance with TfNSW's *Greenhouse Gas Inventory Guide for Construction Projects* (TfNSW, 2013). The carbon footprint would to be used to inform decision making in design and construction.

Due to the small scale of the Proposal and the short-term temporary nature of the individual construction works, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Section 7.2.

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 Waratah. 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.

6.13.2 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 Lower Hunter region can be assessed in terms of weather changes, storm intensity, flooding and increased risk of fire.

Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall excepted to occur in a 100-year average recurrence interval flood event would occur more frequently. Such changes in weather in the Lower Hunter region may contribute to flooding issues however a detailed hydrological assessment would be undertaken to ensure that the proposed infrastructure would not increase the potential for flooding within the Proposal area. For more information on flooding, refer to Section 6.9.

Climate change could lead to an increase in frequency and severity in bushfires. Newcastle City Council, in conjunction with NSW Rural Fire Services have produced a bushfire prone

land map. The Proposal site is not mapped as being bushfire prone, nor located within close proximity to a bushfire prone area. The closest bushfire risk area is Braye Park in Waratah West, approximately 1.2 km west of the site. Additionally, the suburb of Waratah and the surrounding areas are highly urbanised, with very limited pockets of remnant bushland and therefore is unlikely to be subject to bushfire risk. The Proposal would be designed with appropriate fire protection measures.

6.13.3 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 Infrastructure Sustainability Council of Australia's (ISCA) Infrastructure Sustainability (IS) Rating Tool Version 1.2 and the TfNSW Environmental Management System (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.1.4 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.

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 the TfNSW 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 19. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 19 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Construction Contractor in accordance with the relevant requirements of *Guideline for Preparation of Environmental Management Plans,* Department of Infrastructure, Planning and Natural Resources, 2004) for approval by TfNSW, 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 Construction 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 Construction Contractor in accordance with TfNSW's *Guide to Environmental Controls Map* (TfNSW, 2017c) for approval by TfNSW, 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.

No.	Mitigation measure
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by TfNSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
	Traffic and site access
8.	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: • 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 is to be monitored for compliance • routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses • details for relocating kiss and ride, 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. Consultation with the relevant road authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.
9.	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 works.
10.	Road Occupancy Licences for temporary road closures would be obtained, where required.

No.	Mitigation measure
	Urban design, landscape and visual amenity

11.	An Urban Design Plan (UDP) would be prepared by the Construction Contractor, in consultation with the relevant council, and submitted to TfNSW 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:
	• 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:
	  ○ 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 wall height, active frontages, awnings, 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 site.

12.	A Public Domain Plan (PDP) would be prepared by the Construction Contractor, in consultation with the relevant council, and submitted to TfNSW 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: • 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 applicable requirements specified in the TfNSW NSW Sustainable Design Guidelines -Version 4.0 (TfNSW, 2017) and any relevant Infrastructure Sustainability Rating Scheme – Version 1.2 (ISCA, 2018) requirements • identification of design and landscaping aspects that would be open for stakeholder input, as required.
13.	All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to *AS 1158 Road Lighting* and *AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting.*
14.	The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.
15.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.

No.	Mitigation measure
16.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
17.	During construction, graffiti would be removed in accordance with TfNSW's Standard Requirements.
18.	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.
	Noise and vibration
19.	Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise Strategy and Vibration Strategy* (TfNSW, 2018b) and the Noise and Vibration Impact Assessment for the Proposal (SLR 2018b). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
20.	The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • 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.

No.	Mitigation measure
21.	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: • 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 works 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 works • use of quieter and less vibration emitting construction methods where feasible and reasonable.
22.	Works 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 works outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Construction Contractor and submitted to the TfNSW Environment and Planning Manager for any works outside normal hours.
23.	Where the $L_{Aeq\ (15minute)}$ construction noise levels are predicted to exceed 75 dBA and/or 30 dBA above the Rating Background Level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with TfNSW's *Construction Noise and Vibration Strategy* (TfNSW, 2018b). This would include restricting the hours that very noisy activities can occur.
24.	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.
25.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed works would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (SLR, 2018b) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
26.	Vibration resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage vibration - German Standard DIN 4150: Part 3 – 1999 *Structural Vibration in Buildings: Effects on Structures* and British Standard *BS 7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)* • for human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS *7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*
27.	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory works including jack hammering and compaction for all buildings/structures/roads with a plan distance of 50 metres from the works and all heritage listed buildings and other sensitive structures within 150 metres of the works (unless otherwise determined following additional assessment they are not likely to be adversely affected).

No.	Mitigation measure
28.	Affected pre-schools, schools, universities and other identified sensitive receivers would be consulted in relation to noise mitigation measures to identify any noise sensitive periods, e.g. exam periods. As much as reasonably possible noise intensive construction works in the vicinity of affected educational buildings are to be minimised.
29.	During the construction phase of the Proposal a temporary noise wall would be constructed in the rail corridor adjacent to the new lift shaft location on Hanbury Street. The temporary noise wall would ensure that existing noise mitigation is not compromised in this location.
	Indigenous heritage
30.	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.
31.	If unforeseen Indigenous objects are uncovered during construction, the procedures contained in TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2016a) would be followed, and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the OEH and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and the OEH notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.
	Non-Indigenous heritage
32.	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.
33.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2016a) would be followed, and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the TfNSW Project Manager and the TfNSW 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 works recommencing at the location.
34.	An archaeological review (including of parish maps) would be undertaken during detailed design to determine the potential for subsurface archaeological items (and their significance).
35.	Where possible, original elements of the station, such as the decorative posts at the base of stairs would be retained or repurposed.
	Socio-economic
36.	Sustainability criteria for the Proposal would be established to encourage the Construction Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.

No.	Mitigation measure
37.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
38.	A Community Liaison 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.
39.	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.
40.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction.
	Biodiversity and arboricultural
41.	Construction of the Proposal must be undertaken in accordance with TfNSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2018c) and TfNSW's *Fauna Management Guideline* (TfNSW, 2018e).
42.	All workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity.
43.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Ecological Impact/Arborist Assessment (RPS. 2018, Allied Trees Consultancy 2018) 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.
44.	Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Ecological Impact/Arborist Assessment (RPS 2018, Allied Trees Consultancy 2018). Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs.
45.	In the event of any tree to be retained becoming damaged during construction, the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
46.	Should the detailed design or onsite works determine the need to remove or trim any additional trees, which have not been identified in the REF, the Construction Contractor would be required to complete TfNSW's Tree Removal Application Form and submit it to TfNSW for approval.
47.	For new landscaping works, mulching and watering would be undertaken until plants are established.
48.	Weed control measures, consistent with TfNSW's *Weed Management and Disposal Guideline* (TfNSW, 2015), 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 *Noxious Weeds Act 1993.*

No.	Mitigation measure
49.	Offsets and/or landscaping would be undertaken in accordance with TfNSW's *Vegetation Offset Guide* (TfNSW, 2016b) and in consultation with NCC, and/or the owner of the land upon which the vegetation is to be planted. The two trees earmarked for removal would be offset with a minimum of 8 trees as advised in the Ecological Impact/Arborist Assessment (RPS, 2018 and Allied Trees Consultancy 2018). Any additional clearing would also require tree offset planting.
	Soils and water
50.	Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (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 works and maintained throughout construction.
51.	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 works are complete and areas are stabilised.
52.	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.
53.	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 TfNSW's *Chemical Storage and Spill Response Guidelines* (TfNSW, 2018g).
54.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the TfNSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2018g) 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.
55.	In the event of a pollution incident, works would cease in the immediate vicinity and the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager. The EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act.
56.	The existing drainage systems would remain operational throughout the construction phase.
57.	Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and TfNSW's *Water Discharge and Reuse Guideline* (TfNSW, 2017d).
	Air quality
58.	Air quality management and monitoring for the Proposal would be undertaken in accordance with TfNSW's *Air Quality Management Guideline* (TfNSW, 2018f).
59.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.

No.	Mitigation measure
60.	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.
61.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
62.	To minimise the generation of dust from construction activities, the following measures would be implemented: • 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
63.	The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum: • identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • 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.
64.	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.
65.	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.
66.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.
67.	The handling, storage, transport and disposal of all asbestos and hazardous waste (if identified during construction) would occur in accordance with the requirements of the PoEO Act, WARR Act and other relevant guidelines.
68.	Any concrete washout would be established and maintained in accordance with TfNSW's *Concrete Washout Guideline* – draft (TfNSW, 2018d) with details included in the CEMP and location marked on the ECM.
69.	An acid sulfate soils (ASS) management plan is to be prepared in accordance with the Acid Sulfate Soils Manual to ensure that the risks associated with the identification and management of ASS and potential acid sulfate soils (PASS). If ASS/PASS is identified then the spoil is to be managed and disposed of appropriately.

No.	Mitigation measure
	Climate change and sustainability
70.	Detailed design of the Proposal would be undertaken in accordance with the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2017).
71.	Detailed design of the Proposal would target a rating of 'Excellent' using the ISCA Infrastructure Sustainability Rating Scheme (v1.2)
72.	The detailed design process would include a Greenhouse Gases (project level) compliant carbon footprinting exercise in accordance with AS14064-2 and the TfNSW *Greenhouse Gas Inventory Guide for Construction Projects* (TfNSW, 2013e). The carbon footprint would then be used to inform decision making in design and construction.
	Cumulative impacts
73.	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 Waratah Station for customers resulting from the installation of lifts, a ramp and an associated elevated walkway that together create an accessible pathway to the platforms and both station entrances
- improved interchange facilities including enhancements to the existing kiss and ride / taxi zones and provision of accessible parking space
- improved station amenity and safety for customers at the station resulting from the installation of the Family Accessible Toilet, ambulant toilet, accessible waiting room, new lighting and CCTV.
- enhanced kiss and ride facility on Railway Terrace will provide an improved amenity for customers travelling to/from the station as vehicle passengers
- new accessible ramp at the Platt Street entrance will improve user accessibility and amenity by providing an alternative that doesn't require travel via stairs
- new accessible parking space on Platt Street will provide proximate opportunity for persons with a disability to park near the new lift
- new lifts will improve user accessibility and amenity by providing an alternative to stairs to all platforms and also for travel across the rail line that is not related to rail travel
- upgraded footpaths (quality and width) will improve accessibility and amenity for customers accessing the station.

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

- temporary changes to vehicle and pedestrian movements to, from and around the station during construction – these impacts were assessed to be minor and would be managed via the implementation of a Construction Traffic Management Plan
- impacts to the visual character of Waratah Station due to the installation of three lifts and the elevated walkway associated with the accessible path to Platform 2
- removal of two mature trees (*Syzygium paniculatum* and *Callistemon salignus*) adjacent to the proposed lift on Railway Terrace which, although the *Syzygium paniculatum* is identified as a threatened species, has been assessed as not being a significant environmental impact.
- temporary noise and vibration impacts during construction – these impacts were assessed as being variable dependent on the construction stage. Higher levels of noise are anticipated during vegetation clearing, noise wall modification and during rail shut downs outside of standard hours. Impacts would be mitigated through the implementation of a range of mitigation measures in the *Construction Noise and Vibration Strategy* (TfNSW 2018b).

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.

The Proposal would also take into account the principles of ESD (refer to Section 3.1.4 and Section 4.6). 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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Appendix A Consideration of matters of National Environmental Significance

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

Matters of NES	Impacts
Any impact on a World Heritage property? No World Heritage properties are located in the vicinity of the Proposal area.	Nil
Any impact on a National Heritage place? No National heritage places are located in the vicinity of the Proposal.	Nil
Any impact on a wetland of international importance? No wetlands of international significance are located in the vicinity of the Proposal.	Nil
Any impact on a listed threatened species or communities? No threatened species or communities would be impacted by the Proposal	Nil
Any impacts on listed migratory species? It is unlikely that the Proposal would significantly affect any listed migratory species.	Nil
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 upgrade 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 TfNSW's consideration of the specific factors of clause 228 of the EP&A Regulation in determining whether the Proposal would have a significant impact on the environment.

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic, access and visual amenity. The potential temporary shutdown would result in an inconvenience to commuters. Mitigation measures outlined in Section 7.2 would be implemented to manage and minimise adverse impacts.	Minor
(b) Any transformation of a locality? The Proposal would include the introduction of new visible elements to the station (including the construction of new lifts, an elevated walkway and an improved accessible path). The appearance of the new elements would be consistent with the existing station elements.	Minor
(c) Any environmental impact on the ecosystem of the locality? One tree and one garden bed would be removed as a result of the Proposal. The tree to be removed has been identified a planted threatened species and the garden bed is not identified as contributing to the local ecology. The removal of these elements is considered to have a negligible impact on the ecosystem of the locality.	Negligible
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The introduction of the new lifts would have a minor impact on the visual character of the area.	Minor
(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? The Proposal would be a positive contribution to the area as it provides equitable access to the station platforms and improves amenity of the station for all customers. The proposal is not anticipated to have any impacts on the locality from an archaeological, architectural, cultural or social elements of the locality	Negligible
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The Proposal would not have any impact on habit of protected fauna.	Nil
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely to have any impact on endangering any species of animal, plant or other form of like, whether living on land, in water or in the air.	Nil

Factor	Impacts
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment.	Negligible
(i) Any degradation of the quality of the environment? The Proposal is unlikely to cause degradation of the quality of the environment.	Nil
(j) Any risk to the safety of the environment? 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, excavation or demolition works	Minor
(k) Any reduction in the range of beneficial uses of the environment? The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	Nil
(l) Any pollution of the environment? The Proposal is unlikely to cause any pollution of the environment provided the recommended mitigation measures are implemented.	Nil
(m) Any environmental problems associated with the disposal of waste? The Proposal is unlikely to cause any environmental problems associated with the disposal of waste. 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.	Minor
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely to increase demands on resources that are, or are likely to become, in short supply.	Nil
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative effects of the Proposal are described in Section 6.12, 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.	Nil
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The Proposal would not affect or be affected by any coastal processes or hazards.	Nil